



## Chapter Nine: And The Rains Came

The river belongs to the nation,  
The levee, they say, to the state;  
The government runs navigation,  
The commonwealth, though, pays the freight.  
Now, here is the problem that's heavy—  
Please, which is the right or the wrong?  
When the water runs over the levee,  
To whom does the river belong?...

I know very little of lawing,  
I've made little study of courts,  
I've done little geeing and hawing  
Through verdicts, opinions, reports;  
Why need there be anything more said  
When the river starts levees to climb?  
If the government owns the aforesaid,  
It must own it all of the time.

If it's your Mississippi in dry time,  
It's yours, Uncle Sam, when it's wet;  
If it's your Mississippi in fly time,  
In flood time it's your river yet.  
There's no other way you can make it,  
And so, when I give the alarm,  
Come and get your darned river and take it  
Away from my timber and farm!¹

Flood control has been an important function of the St. Paul District throughout its history. While other Corps districts were not authorized to make flood control studies until the 1920s, the St. Paul District has been unique in this respect. Before the end of the nineteenth century problems associated with the reservoirs in the headwaters region of the upper Mississippi and steamboat travel on the Red River of the North forced St. Paul engineers to consider flood control as an integral part of their navigational studies and project designs. Since the passage of the Flood Control Act of 1936, however, this phase of Corps activity has come to dominate the St. Paul office. In the past thirty years the district has been asked

The flood of 1950 produced more requests for flood control studies than any other flood in the district's history.



to make nearly 250 flood control and flood plain management studies. All of the different solutions to this complex annual problem — from emergency operations to flood plain evacuation and relocation — have been considered by engineers in St. Paul. The district has constructed projects representing probably every possible alternative in flood control management.

Five separate flood plain basins exist in the St. Paul District: the upper Mississippi River, the Red River of the North, Lake Superior, and the Souris and Rainy River international basins. Floods occurring through a wide range of years have been caused by a variety of physical conditions, and have resulted in a multifarious assortment of proposals for controlling the numerous rivers, coulees, creeks, streams, dry runs, sloughs, chains of lakes, marshes and ditches in the five flood plain basins of the district. Between 1938 and 1951 over \$1,390,000 was spent on preliminary examinations and surveys for flood control.

Of the approximately 250 flood control studies that Congress has asked the St. Paul Corps of Engineers to make, 138 were authorized in 1950. Representative Harold C. Hagen sponsored 103 of these resolutions. All of this activity came as a result of the huge flood on the Red River of the North in April and May of 1950. More than fifty-two million dollars (1967 prices) in damages were

caused by the most destructive flood in the history of this 395-mile river. Deep frost, heavy winter snows, a spring blizzard and an early upstream breakup all contributed to the inundation of the broad and fertile river valley. The capacity of the Red River at Grand Forks is 32,000 cubic feet per second (cfs) and at Pembina on the northern border it is 35,000 cfs. In 1950 the flow of the Red peaked at 54,000 cfs at Grand Forks and 95,500 cfs at Pembina. Over two million acres of rich farmland were flooded. Ten cities and thirty-two small communities suffered severe losses.<sup>2</sup>

As a result of the studies and flood projects which followed the 1950 flood, it was estimated that damages were reduced by \$29,100,000 in the next major flood, which occurred in 1969. In that year the flow of the river at Fargo increased to three times its normal bank-full flow. "Operation Foresight," an emergency pre-flood program under the direction of the Corps, contributed to the reduction in property loss. Equally important in meeting the flood emergency were the thousands of volunteers who filled sandbags, built temporary dikes, manned the auxiliary pumps and kept a constant vigil for breaks in the levees protecting major urban centers. Nevertheless, the 1969 flood still caused over 108 million dollars in destruction to homes, farmland, businesses, public utilities and transportation networks.<sup>3</sup>

The most extensive flooding over the whole district occurred in 1965. On April 11, 1965, President Lyndon B. Johnson declared a flood disaster area in fifty-seven counties in Minnesota, nineteen in Wisconsin and thirteen in North Dakota. The total affected area covered 109,000 square miles. The flood was caused by deep frost, a widespread snow cover containing up to eleven inches of moisture, a late spring thaw and heavy rains in April. Over 103 million dollars in damage was done, affecting 115 communities and 21,000 families. The tributaries of the Minnesota River, which are usually insignificant, placid streams, became great waterways within a few days. The Minnesota River rose seventeen feet in three and one-half days at Mankato and crested at 29.09 feet on April 9. The lowest recorded flow at Mankato was 26 cfs in January, 1934. In the 1965 flood, 94,100 cfs swirled through the city.<sup>4</sup> The *Mankato Star* provided comic relief by asking the question, "What is worse than having water in your basement?" and answering the query with, "Having water in your attic!"<sup>5</sup>



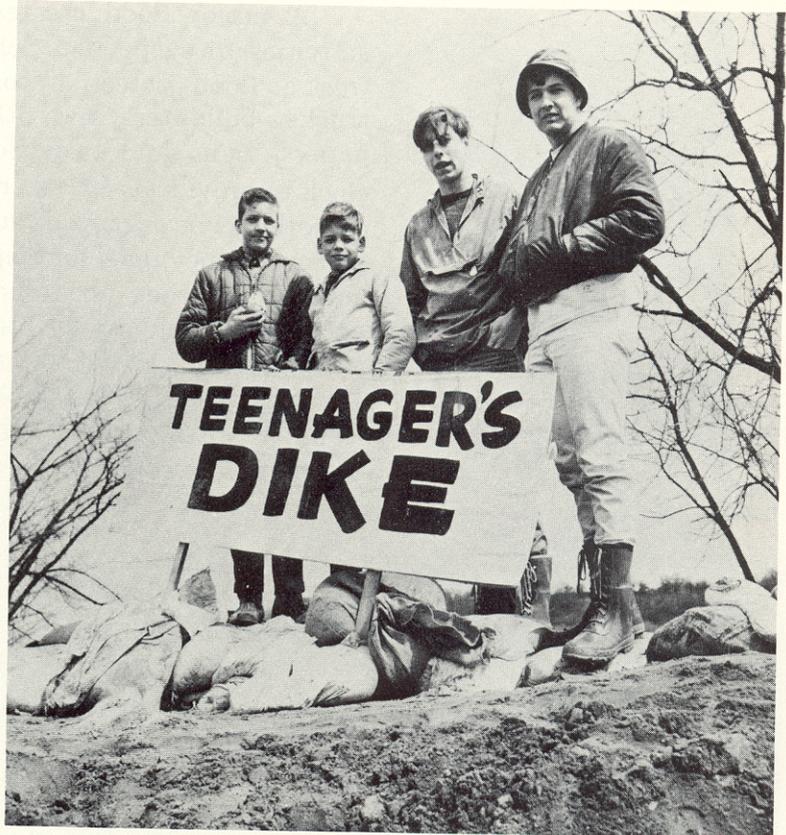
During times of flood emergencies the Corps can call upon the resources of the regular army for materials. Here sandbags are delivered in government trucks during the flood fight in Minot, North Dakota, in 1976.

Mankato wasn't the only city to suffer. The city of Stillwater on the St. Croix endured over two million dollars in damage; Carver on the Minnesota experienced a 117,000 cfs flow; St. Paul had thirteen days of high water. The Mississippi went twelve feet over flood stage at the capital. The St. Paul Union Depot was forced to close for two weeks, the St. Paul airport for four weeks and the high water caused extensive damage to the South St. Paul stockyards. At Red Wing a previous record had been set on April 18, 1952, when the Mississippi crested with a flow of 155,000 cfs. On the same date in 1965 the flow measured 230,000 cfs. Downriver at La Crosse over 1,200 people were evacuated from French Island and at Prairie du Chien the rushing waters rose four feet above the previous record flood. Although the damages were great, emergency operations by local communities saved 108 million dollars' worth of property from destruction.<sup>6</sup>

A major flood creates a dramatic scene. Normal activities are suspended. Schools close to allow students to work on flood protection; construction companies mobilize trucks, bulldozers and other heavy equipment; newspapers, radio and television stations work around the clock to provide essential communication needs; churches and other civic organizations supply food for flood workers and emergency relief for displaced families; city employees suspend all other jobs to help protect sanitation facilities and water supplies; businessmen donate needed goods; national media arrive to record the excitement and the suffering. Communities are brought closer together by a common cause and an unselfish commitment to the welfare of others. Everyone realizes that the emergency is short-term and that time is a critical factor.<sup>7</sup>

Temporary levees of earth and gravel covered by sandbags are part of every flood fight. This levee was built during the Minot flood in 1976.





Community help and spirit peak during a flood crisis. This picture was taken at Stillwater, Minnesota, in 1965.

During such a period the Corps of Engineers serves as an auxiliary agent of the state under Public Law 99. After the governor of a state has been warned by the National Weather Service that floods are imminent for an area, he may declare an emergency. The Corps of Engineers can then aid by planning temporary levees, providing sandbags and pumping equipment and if necessary securing construction equipment. Labor during the flood and post-flood cleanup is the responsibility of the local community. Scarcely a spring has come since the drought years of the 1930s when the St. Paul office has not been requested by a governor of Minnesota, North Dakota or Wisconsin to provide emergency relief assistance.

The greatest mobilization of the district occurred in 1969. The Corps published a warning of spring run-off, *Flood Outlook*, on February 19 and sent copies to congressmen, senators, governors, federal agencies, state and local governments and the mass media. Within thirty days over fifty communities requested technical assistance from the Corps of Engineers for flood preparation.<sup>8</sup> During this interval President Richard M. Nixon ordered the director of the Office of Emergency Preparedness to co-ordinate the

The St. Paul District has personnel that can fly to any other district in the United States to assist with flood fighting. The district can in turn call upon seasoned experts in other districts to provide help during emergencies.



Floods seldom occur overnight. The waters build up over a period of weeks, peak, and then recede. Consequently, with the aid of many governmental agencies concerned with water regulation, a flood can be predicted and communities can be prepared. "Operation Foresight" was the name given the preparatory plans for the 1969 flood in the St. Paul District.

resources of the federal government to aid state and local officials in planning for the anticipated high water. This emergency preparation was called "Operation Foresight." The Corps acted quickly to award \$3,500,000 in contracts for the construction of emergency dikes for eighty-three communities in the upper Mississippi basin. By the time the flood came, 82.4 miles of emergency levees had been built. About eighty-four million dollars of damages were prevented by emergency works.<sup>9</sup>

Action on short-fuse emergency conditions is not difficult to obtain. Inactive civic groups, conservative and liberal politicians, crisis-prone reporters, threatened citizens and disrupted businessmen all come alive and "give their best shot." Long-range planning for a permanent solution is another matter. When the floods subside and the crisis abates, few individuals are ready to provide the time, effort and money needed to support a comprehensive plan for flood plain management. Consequently, less than twenty percent of the flood control studies conducted by the St. Paul office have resulted in permanent protective measures. Such apathy for long-range planning by governmental bodies in the St. Paul District has had an

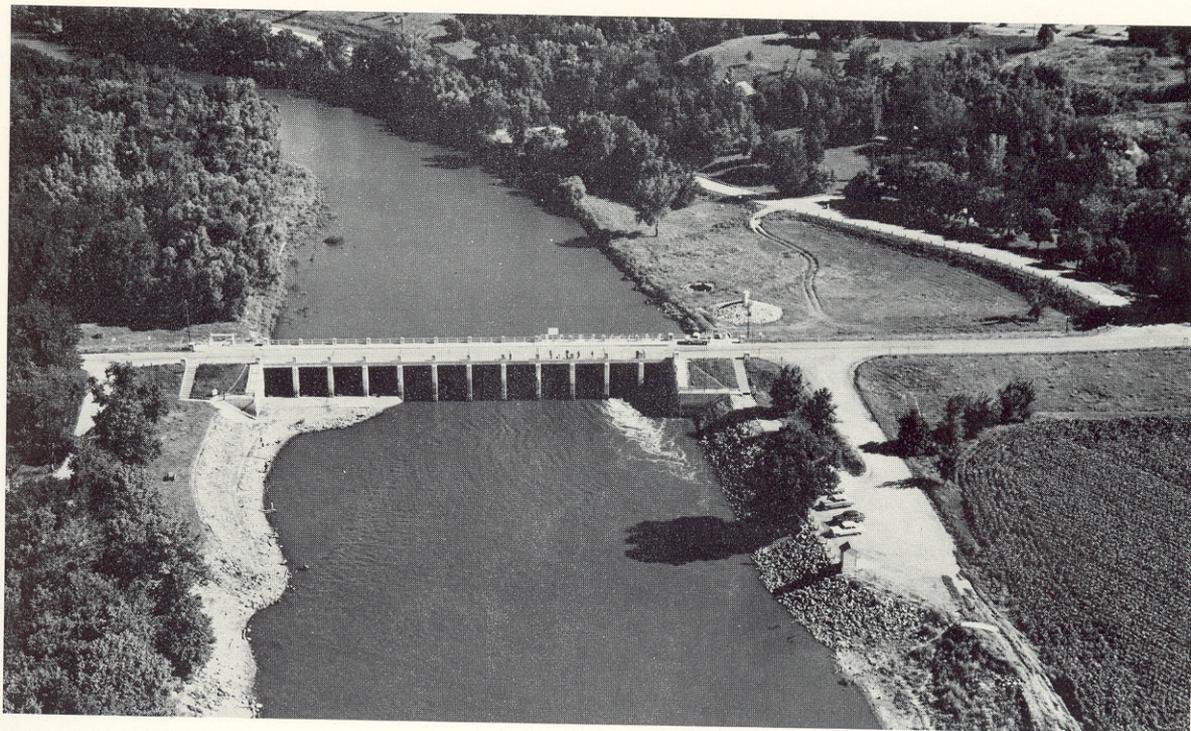
uncomfortable effect on much of the rest of the nation, for flood plain management is never totally a local consideration. Because the St. Paul District contains the headwaters of the three largest drainage systems of the North American continent, it becomes a source for flooding in Manitoba, for bank erosion on all the Great Lakes and for serious destruction caused by the Mississippi in the states of Iowa, Missouri, Mississippi, Kentucky, Tennessee, Arkansas and Louisiana.

Except during times of crisis, the common response to flood plain management has been twofold. For those living upstream the approach is highly critical: "People should not be stupid enough to build homes, develop businesses, and put civic improvements on land prone to flooding."<sup>10</sup> Of the 189,000 square miles in the upper Mississippi River basin, eight percent or 15,500 square miles is subject to flooding. Much of this property has been highly developed. The average yearly damage is 133 million dollars, and devastating floods can occur in any of 304 communities.<sup>11</sup> Farm land along rivers is expensive and desirable because of flood plain fertility. Urban centers have flourished on bottomlands because of the flat terrain, scenic attractiveness, sources of water supply and waste disposal, favorable building conditions and easy access to both water transportation and railroads that have been constructed along the gradual grades of the river valleys. While many states and municipalities have restricted further development of flood plains, there are equally strong pressures to building there because of the obvious economic benefits of river frontage.

#### *Reservoirs*

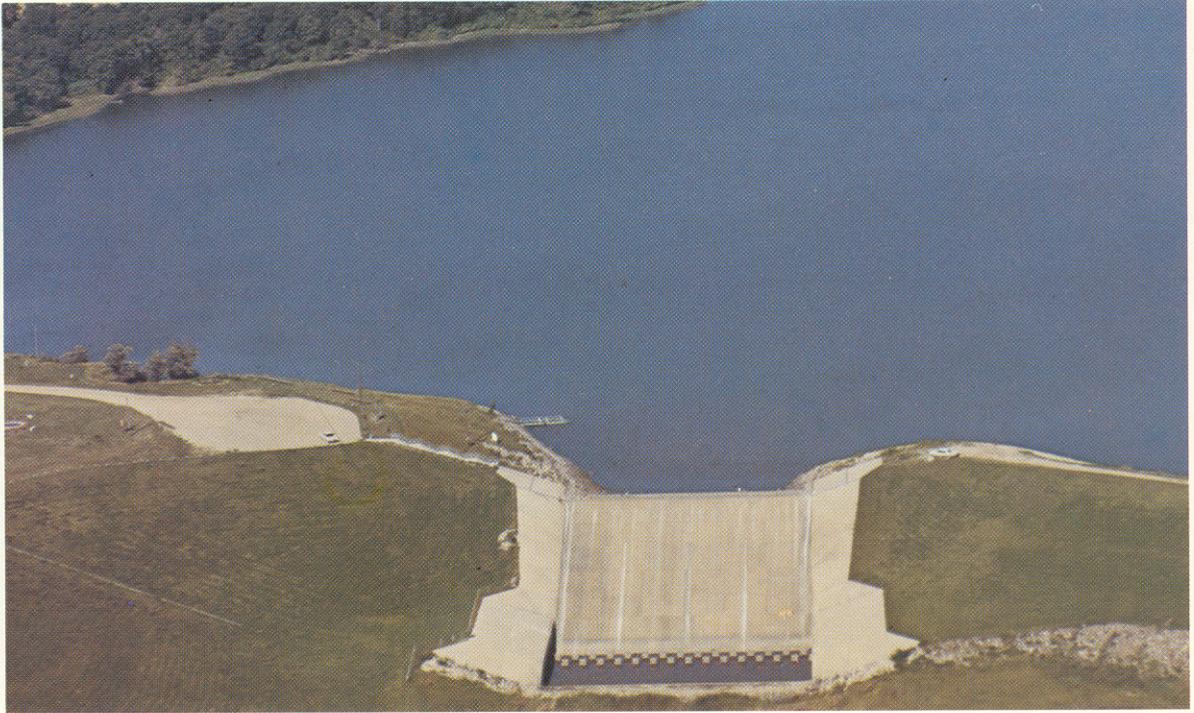
There are five basic methods by which engineers can, with obvious economic benefits, keep water run-off from affecting low land.<sup>12</sup> The first is to dam water at the source and release it gradually over a period of time. The construction of dams on major tributaries is the most expensive method of control because of the need to purchase thousands of acres of valuable and productive land for water storage, and the costs in building, regulating and maintaining a large structure which produces no taxable income.

Traditionally, in spite of its image as a dam builder, the Corps of Engineers has had a policy of considering all alternatives. In the St. Paul District less than ten percent of the dams sought by political factions, business interests



The Lac qui Parle reservoir on the Minnesota River near Montevideo was designated and built by the state of Minnesota under the Works Progress Administration in the early 1930's. In September, 1950, the flood control project, including control structures at Marsh Lake and the Watson Sag on the Chippewa River, was turned over to the Corps of Engineers to manage and maintain.

and local communities have been built. If one includes the six projects at Mississippi headwaters lakes (Winnibigoshish, Leech, Pokegama, Sandy, Pine River and Gull), the district has completed fourteen flood control reservoirs, has one in the construction stage and has three more in the planning stage. Flood control dams have been built at White Rock at the head of the Bois de Sioux River between Minnesota and South Dakota (1948), on the Red Lake River in Minnesota (1951), at Lac qui Parle on the Minnesota River in Minnesota (1951), at Orwell Lake on the Otter Tail River in Minnesota (1953), at Lake Ashtabula and Baldhill on the Sheyenne River in North Dakota (1956), at Homme Lake on the Park River in North Dakota (1956), on the Eau Galle River in Wisconsin (1968) and at Big Stone-Whetstone on the Minnesota-South Dakota border (1974). All of these dams are earth embankments and relatively small flood control structures, built at a total cost of a little more than twenty-eight million dollars. Plans for another reservoir on the Kickapoo River at La Farge, Wisconsin, have been suspended pending final action by Congress. Other dams are planned for sites at Twin Valley Lake on the Wild Rice River, Kindred Lake on the Sheyenne River in North Dakota and Burlington on the Souris River in North Dakota. Most of the Corps dams in the district are multi-purpose structures which serve other local water resource needs in addition to flood control.



The Homme dam and reservoir built in 1950 is located about four miles upstream from Park River, North Dakota. The 865-foot earth-filled structure is used to control spring run-off and provide water storage for the communities of Grafton and Park River, North Dakota.

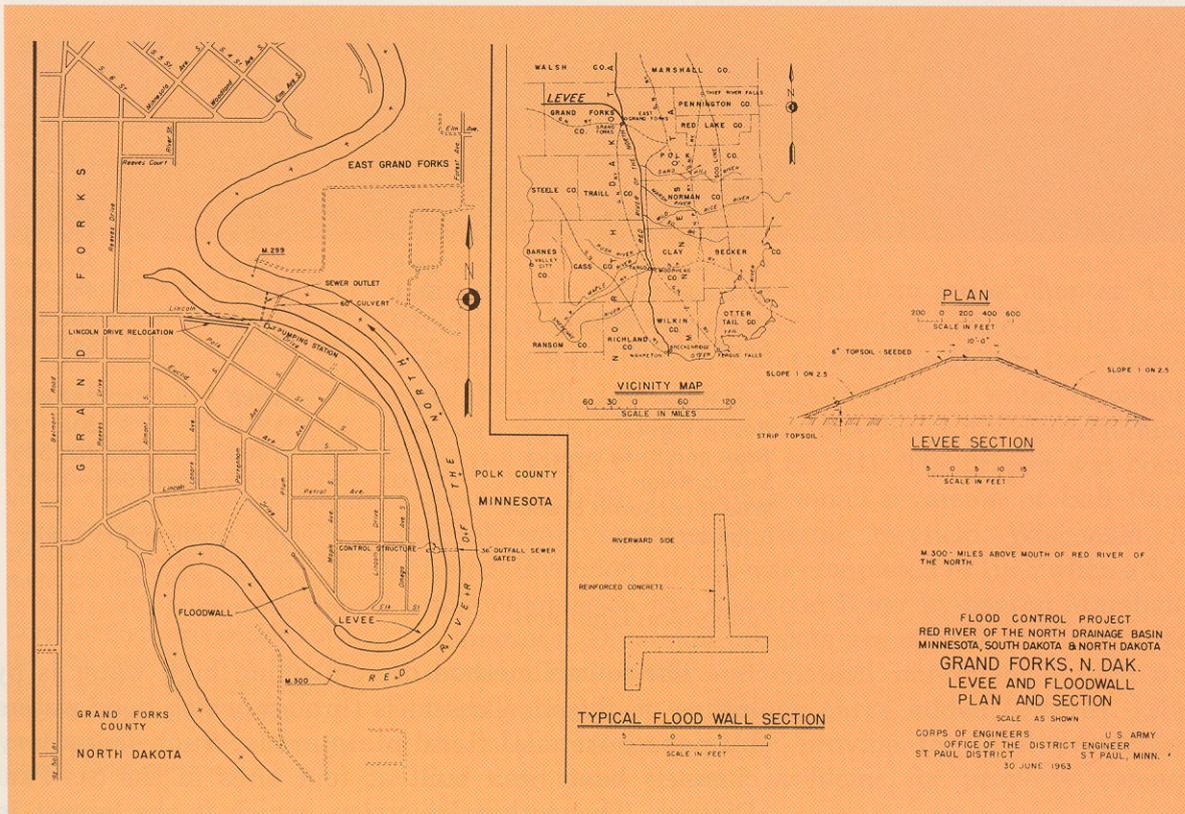
There are, of course, hundreds of dams that have been constructed by other agencies on rivers in the district. None of them were built specifically for flood control. For example, there are twenty-seven dams built primarily for water power along the 430-mile stretch of the Wisconsin River. None of them were Corps of Engineers projects.<sup>13</sup> Their effect in holding back spring floods is limited. Likewise, the Soil Conservation Service has helped many ranchers, farmers and small local communities to construct dams under Public Law 566. These structures are limited to watersheds with a maximum drainage of 250,000 acres and can only be designed with a detention capacity of 12,500 acre feet and a total capacity of 25,000.<sup>14</sup> One of the most effective flood control dams in the district has been the Lake Darling Dam on the Souris River. It was built in 1936 by the United States Fish and Wildlife Service and the reservoir is managed as a waterfowl refuge.<sup>15</sup>

#### *Levees and Floodwalls*

A second means of controlling floods is the centuries-old technique of building levees and flood walls. Such a flood barrier is usually made of earth or reinforced concrete with facilities for pumping out seepage and run-off of rain water from the protected area. The first levee designed and built by the Corps of Engineers in the North Central Division was completed in 1950 at Decorah, Iowa, on

Upper Iowa River.<sup>16</sup> Since then the St. Paul District has spent a little over twenty-five million dollars on twelve other primarily levee and flood wall projects including those on the Mississippi at Winona, Minnesota (built in 1967), at Guttenberg, Iowa, and at Elk River, Minnesota (1969), St. Paul (1964) and South St. Paul (1968). Four additional urban protection levees on the Red River were built at Fargo and Grand Forks (1961), Oslo and Pembina, North Dakota. A small project on the Yellow Medicine at Minneota, Minnesota (1963), a large project at Mankato and a farmland protection levee on the Zumbro River complete the list. Even though many other levees and flood walls have been constructed by municipalities in the district, the fact that only thirteen such Corps projects have been built over a thirty-five year period points rather dramatically to the lack of regional, early long-range planning for direct local control over flood problems. This in spite of the fact that levee and flood wall construction is one of the least expensive means for providing protection. In some communities the temporary levees built by the Corps during flood emergencies have been allowed to remain despite their inadequacy in solving long-range regional flood control problems.

Other than reservoirs, the most common solution to flood control problems is the construction of a flood wall and levee. The Grand Forks dike was completed in 1958.



*Channel Stabilization*

A third means of flood control (and by far the most popular in the St. Paul District) is channel stabilization. Naturally this means of flood control is often used to supplement levee and flood wall protection, and is thus part of the levee projects discussed above. Channel improvement projects are normally turned over to local officials for management and maintenance. At a cost of over twenty-five million dollars the St. Paul District has improved 315.33 miles of river for flood protection purposes. These projects are listed in Table 46.

The methods of channel improvement consist of straightening natural channels by cutoffs, clearing snags, debris and vegetation from the channel, and widening and deepening the river or stream. These methods are effective on small rivers because such work increases the rate of discharge and allows water to pass rapidly through a given area. Naturally, such "improvements" can cause problems for those living downstream. Channel improvements, like dam and reservoir design, are only a part of a total flood protection unit including the complete river drainage basin.

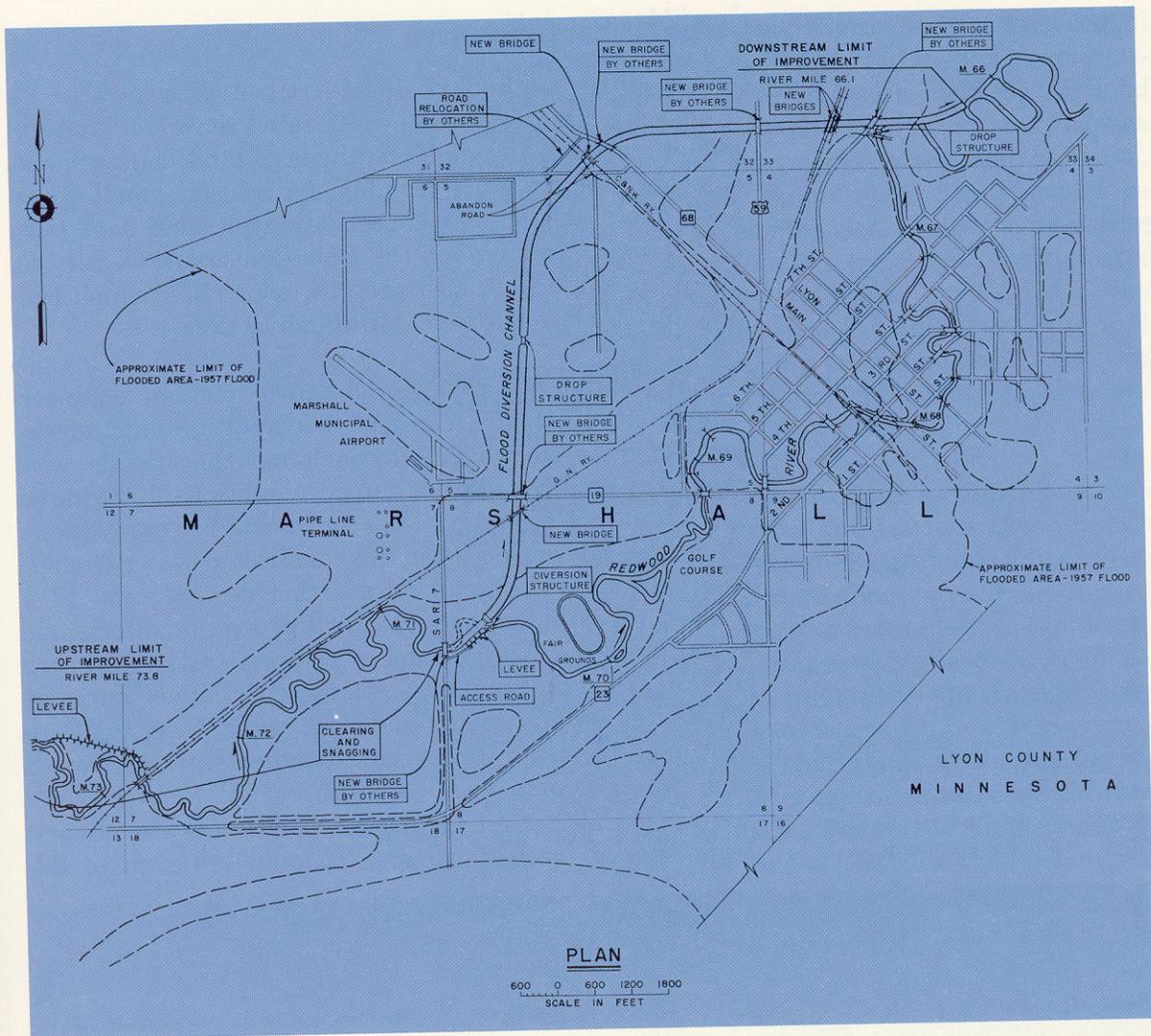
TABLE 46 FLOOD CONTROL  
COMPLETED CHANNEL IMPROVEMENT PROJECTS

Channel	Miles	Year Completed	Cost
Redwood River	12.3	1953	\$ 238,500
Wild Rice and March Rivers	38.9	1954	\$ 405,056
Otter Tail River	11.4	1954	\$ 174,768
Rush River	26.9	1956	\$ 287,686
Mustinka River	36.1	1957	\$ 440,788
Upper Iowa River	3.0	1958	\$ 888,445
Sand Hill River	20.1	1958	\$ 548,778
Lost River	43.33	1966	\$ 764,430
Souris River	5.7	1966	\$ 308,123
Root and Rush rivers	6860'	1968	\$2,499,345
Souris River	37.0	under construction—1976	
Wild Rice/South Branch Felton Ditch	35.2	under construction—1976	

From: Corps of Engineers, *Flood Control Project Book* (St. Paul).

*Diversion Channels*

The fourth method of controlling high water is by means of diversion channels through which flood waters by-pass potential flood plain areas. Such secondary channels have been built at four sites in the St. Paul District. The Aitkin Diversion, which is the largest in



In some portions of the St. Paul District excessive floods did not occur for a forty- to fifty-year period. Consequently, many people bought and built homes and businesses upon the natural flood plain without knowing that their properties were in danger. When a community has developed its flood plain, levee construction and channel improvement are not viable alternatives. In Marshall, Minnesota, the Corps of Engineers decided that the best solution was to construct a secondary river channel to divert the course of the river away from the center of the city during flood periods.

the district, has been described in an earlier chapter. The oldest post-1936 flood control project in the district is on the Dry Run River, a tributary of the Upper Iowa River at Decorah, Iowa. First authorized as a water retention reservoir, the design was modified into a diversion channel by the Flood Control Act of 1941. The project was completed in 1950. In 1955 a small diversion of Ball Park Creek was constructed around Bayfield, Wisconsin. A fourth diversion project was completed in 1963 when a 2.4-mile channel on the Redwood River by-passed Marshall, Minnesota. Diversion projects are similar in function to levees, flood walls and channel improvement and are usually designed to include these added features. Like the other methods, they provide for local protection but can cause greater problems for property owners downstream.

A fifth method of flood control concentrates on promoting greater retention of rain, snow and natural run-off through improved methods of land management. Contour plowing, strip farming, forestation, small watershed dams and similar conservation projects have been the primary concern of the Soil Conservation Service. They are important measures for controlling small run-offs, but are less effective during major floods.<sup>17</sup>

As early as 1851 a well-known civilian engineer, Charles S. Ellet, Jr., conducted a hydrographic survey for Congress in which he concluded that floods were caused by artificial and not natural conditions. Individuals and communities had by 1850 constructed so many levees along the Mississippi that the constricted water channel was causing widespread devastation downstream. Ellet blamed the problem on local flood protection efforts and asked Congress to consider a comprehensive approach to the problem, including reservoirs, channel improvements, levees, diversions and flood-ways.<sup>18</sup> Yet Congress continued to authorize piecemeal projects, which treated each water course as a separate entity. Such projects were politically effective in gathering votes and support from special interest groups. To stop criticism of this

Contour farming, shown above in Lac qui Parle County in Minnesota, is one example of flood and erosion control that can be practiced on small watersheds.



spoils system approach, Congress created the Mississippi River Commission (MRC) on June 28, 1879. The commission was given power to investigate methods of flood protection in the entire Mississippi basin, but it was prohibited from going into the construction business. Between 1882 and 1890 Congress allotted about three million dollars for the commission to use in assisting local levee construction.<sup>19</sup> In the same year that it created the MRC, Congress also established the United States Geological Survey. Its first director, John Wesley Powell, began immediately to gather a staff capable of producing comprehensive plans for the development of water and land resources.<sup>20</sup>

When Representative Theodore E. Burton became chairman of the House Rivers and Harbors Committee in 1899, he promised to end the spoils system. Only projects which engineers judged meritorious would be funded. Much to the dismay of congressmen and special interests, Burton, along with the conservative leadership of the Corps of Engineers, began to block the passage of many water control projects.<sup>21</sup> Consequently, Congress created additional agencies in the Departments of the Interior and Agriculture to serve local interests concerned with water storage and flood control. Under the sponsorship of Senator Francis G. Newlands of Nevada the Reclamation Act was passed in 1902, providing for a water resource engineering and construction unit in the Department of the Interior.<sup>22</sup> The activity of this new Bureau of Reclamation was limited to river systems west of the Mississippi. The bureau's largest project in the St. Paul District has been the Garrison Dam Diversion in North Dakota. Three years later when the Bureau of Forestry was transferred from the Department of the Interior to the Department of Agriculture, the latter department also acquired a water resource unit with the power to build dams and reservoirs and to plan hydroelectric plants. In 1906 this unit became the United States Forest Service under the able direction of Gifford Pinchot.<sup>23</sup> In the same year the National Rivers and Harbors Congress was organized as a semiofficial power structure to challenge the control of rivers and harbors bills by Chairman Burton's committee.

President Theodore Roosevelt tried to co-ordinate the work of these agencies in 1907 when he appointed an Inland Waterways Commission co-chaired by Senator

Newlands and Representative Burton. Newlands believed "that flood control, waterways improvements, reclamation, irrigation and the generation of hydroelectric power could be integrated into a single multiple-purpose plan for each river basin in the Nation."<sup>24</sup> Congress, fearing the concentration of so much power in an executive unit appointed by the president, never funded the commission. Newlands died in 1919 and the advocates of comprehensive national and water resource development lost one of their most effective leaders.

In the meantime, widespread floods in the Mississippi River basin in 1917, 1922 and 1927 moved Congress to provide remedial flood projects. In 1917 the nation's first Flood Control Act provided forty-five million dollars for the Mississippi River Commission to construct levees. The legislation required local communities to furnish lands and rights of way, contribute fifty percent of total costs and assume responsibility for maintenance.<sup>25</sup> The 1922 and 1927 floods revealed the inadequacies of a local approach to levee construction. Thus, in 1927 Congress authorized the famous "308 Reports" (House Document Number 308, 68 Congress) which provided the first opportunity for the Corps of Engineers to study multi-purpose water resource development considering the purposes of navigation, hydropower development, flood control and irrigation.

For the 308 Reports each district of the Corps of Engineers was to prepare a comprehensive study of every river basin within its jurisdiction. Most of these studies were completed by 1935 and were utilized in drafting the historic Flood Control Act of 1936 which authorized the Corps of Engineers to aid local communities in planning for flood prevention. In the St. Paul District little construction was done until after World War II. The war was partially responsible, but two other factors were equally crucial.

First of all, local governments were expected to contribute to the costs of land and construction. They also were required to take partial responsibility for the relocation of public utilities, bridges, roads and railroads that were in the path of the planned improvements, and to create a local governmental body responsible for the upkeep of the project when completed. These obligations were enough to make destitute communities and urban centers hesitate during the depression era, and the addi-

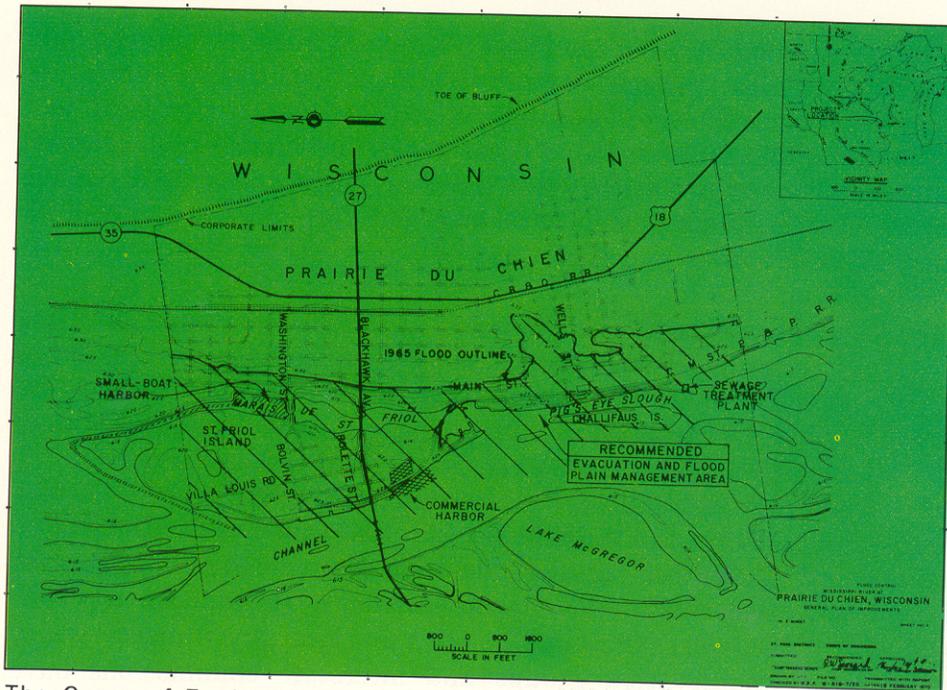
tional requirement that the municipality or county government provide sewage treatment facilities as part of its contribution was enough to discourage any local participation.<sup>26</sup> Flood control was undertaken by local communities as they saw the need, despite the data of the 308 Reports, federal funding and the concern for comprehensive planning.

The second hindrance to comprehensive planning has been the fact that so many agencies have jurisdiction in the control of water, our greatest resource.<sup>27</sup> Besides the Corps of Engineers, the United States Geological Survey (founded in 1879), the National Weather Service (1890), the Bureau of Reclamation (1902), the Forest Service (1906), the Wildlife Service (1940) and the Environmental Protection Agency (1969) are all involved in flood control and water resource development. In addition to these federal agencies, many state and local governmental units, conservation groups and interstate commissions have specific authority over water usage. In the confusion of duties and responsibilities, flood control has remained primarily a local matter.

In recent years the Corps of Engineers has become one of the principal federal agencies working in cooperation with the river basin commissions established by the Water Resources Council to bring different authorities together to provide comprehensive river basin studies. These studies have now been published in multiple volumes for the three major river basins in the St. Paul District.<sup>28</sup> Some cooperative projects have resulted and will be discussed in the following sections. Others have been defeated through strong local opposition, interagency competition and mass media pressure. Every aspect of water management, including the regulation of rain, has become a potential source of controversy and conflict.

## Relocation—Prairie du Chien

On the site of one of the first Corps projects in the upper Midwest (Fort Crawford, founded 1816), the St. Paul District has begun one of the most innovative flood control projects in the nation. The most obvious preventive measure for flood protection is to remove residences and businesses permanently from the flood plain. Yet to date this has rarely been attempted by a federal or state agency. It has not yet been accomplished in



The Corps of Engineers developed a number of alternative plans for flood control at Prairie du Chien before the city decided that flood plain relocation was the best permanent solution.

Prairie du Chien. However, after nine years of meetings, plans and agreements, Congress did authorize a flood evacuation and relocation plan for Prairie du Chien on March 7, 1974.

There was an historical precedent for this project. The Indian village of Odanah in Ashland County, Wisconsin, four miles above the mouth of the Bad River on Lake Superior, experienced recurrent flooding. In 1961 the St. Paul Corps of Engineers developed a plan to move the whole village one and one-tenth miles to higher ground and to protect the existing St. Mary Indian School by a seven and one-half-foot high ring levee. The estimated cost was \$453,000; the plan required the assistance of the Bureau of Indian Affairs to reconstruct 8,000 feet of streets and to provide new wells. Though the plan was economically feasible (benefits would exceed construction costs and maintenance) the Corps could not find a local sponsor "willing and able to provide (local) assurances." Thus the project was dropped.<sup>29</sup>

The opposite occurred at Prairie du Chien. After the record-breaking flood of 1965, a local flood committee requested that the Corps of Engineers aid the city in developing plans for permanent flood control and an emergency flood program. The flood of 1965 sent more than five feet of water swirling over a section of the city one to four blocks wide and three miles long. The entire

residential and business section on St. Friole Island was inundated. Over 1,000 people were evacuated from 250 homes and twenty-five businesses. Public utilities were severely damaged, transportation facilities were destroyed and \$1,900,000 in damages were sustained by the community of 5,349 people.<sup>30</sup> The Corps held a public hearing in January, 1966, and engineers began making studies of the possible alternatives for flood protection.

Bill Pearson and George Skene, St. Paul District study managers, formulated an evacuation and relocation plan for 1968-69. Their research revealed that the flood-proofing of seven businesses, the raising of thirty-one residences and eight businesses, the evacuation or relocation of 149 residences and eight businesses and the purchase of forty-three residences and five businesses would provide the best permanent solution to the \$149,000 average annual damages experienced by those 1,110 people who lived and worked on St. Friole Island and the western edge of the city.<sup>31</sup> The next step was to obtain the cooperation and approval of seven other federal agencies, nine Wisconsin state departments, five multiple-interest groups and the local community.



The city of Prairie du Chien, Wisconsin, is an old river town built along the banks of the Mississippi. The city has a river frontage of three miles with a portion located on the Marais de St. Friol, a backwater channel of the Mississippi. During the 1965 flood, 250 homes were evacuated, twenty-five businesses were damaged, and some parts of the city were under five feet of water.



The Villa Louis, an historic site on St. Friel Island at Prairie du Chien, will not be removed as part of the flood plain evacuation plan. The State Historical Society of Wisconsin has joined the Corps in planning for an historic preservation center in this area.

The Mississippi River cooperated in keeping the need for this project before the people. Seven times between 1965 and 1975 major flooding occurred in the Prairie du Chien community. One of the most important decisions came in 1971 when the city passed a strong flood plain ordinance approved by the Wisconsin Department of Natural Resources. This action restrained future development of the low-lying areas.<sup>32</sup> Plans have proceeded slowly for two reasons. One has been concern about the effect of relocation on residents in the seventeen-block area; many of these people are elderly and have lived on the flood plain for many years. The second reason has been a concern for the preservation of the historical landmarks in the area. The old Fort Crawford blockhouse, the Villa Louis built by Hercules L. Dousman in 1843, the Astor Fur Warehouse, the Dousman Hotel and the Brisbois and Rolette residences form a complex managed by the Wisconsin Historical Society that attracted 60,000 visitors in 1976.<sup>33</sup> Delays in implementation of the plan have had a detrimental effect on the area, as property owners and city officials have postponed needed improvements in anticipation of the relocation. The numerous floods over the past few years have hastened the deterioration of the area and some of the original 407 buildings on the flood plain have been abandoned.<sup>34</sup>

The current plan is for the mandatory permanent evacuation of 130 residential structures and two business establishments (taverns). Floodproofing by raising the remaining structures will be part of the project's costs. These costs will be divided between the federal government

and Prairie du Chien, with the latter assuming twenty percent, or an estimated \$700,000. The city will also be responsible for a yearly maintenance cost of \$5,000 and for developing future recreational and tourist facilities on St. Frieole Island.<sup>35</sup> If the project is carried out, it could become a model of interagency cooperation, with the Corps of Engineers performing the role of coordinator and principal implementing agency.

## Reservoirs—Eau Galle

Since the passage of the Flood Control Act of 1936, the Corps of Engineers has developed eight reservoirs in the St. Paul District. The first was a flood control project completed in 1948 on Lake Traverse. A 14,500-foot earth dam protects Browns Valley, Minnesota, and forms a pool which has become popular for waterfowl hunting and summer recreation.<sup>36</sup> Two North Dakota dams completed in 1950 at Homme and Baldhill provide flood protection for Park River and Valley City, but are more important for the water supply and recreational benefits they offer the semiarid region of that state. Lake Ashtabula behind Baldhill Dam has become a conservation study center for fish, wildlife, forest and biological programs, as well as an attractive location for camping, hunting, fishing, picnicking, boating and hiking.<sup>37</sup> The Orwell Dam was built in 1953, on the Otter Tail River near Fergus Falls, Minnesota. It is operated to retain runoff and to supply water when the Red River is low. Most of the land around the Orwell Dam is managed by the Minnesota Department of Natural Resources for wildlife conservation purposes.<sup>38</sup> Two other reservoirs constructed by other agencies are now managed by the Corps. The Lac qui Parle reservoir on the Minnesota River above Montevideo was begun as a Works Progress Administration project in the 1930s. It was taken over by the Corps in September, 1950.<sup>39</sup> At Red Lake a small dam was built by private interests to control the marshlands on the Red Lake Indian Reservation. The operation of the dam was assumed by the Corps in 1951. The structure was rebuilt by the St. Paul District. Both lakes serve water conservation needs and provide recreation, fish and wildlife, water supply and flood control benefits.<sup>40</sup> All of these reservoirs are located on streams tributary to major rivers and have had strong local support.

The Eau Galle dam is one of the newest district projects. It was constructed between 1965 and 1969 on a small

tributary of the Chippewa River for the protection of the community of Spring Valley, Wisconsin. Floods occurred at this community in 1903, 1907, 1922, 1934 and 1938, usually coming during the spring thaw when losses could be tolerated. However, in September, 1942, a cloudburst brought a flash flood that almost wiped the village of nearly 1,000 people off the map.<sup>41</sup> The sudden three-hour flood caused one and a half million dollars in damages. Luckily no lives were lost. Later the citizens held public meetings to determine how to prevent the stream from causing such tremendous damage in the future. Finally, twenty years later, in November, 1961, Representative Lester Johnson was able to obtain approval for a Corps feasibility study.<sup>42</sup> Corps engineers proposed building an earth-filled dam ninety-six feet high and 1,490 feet long in the narrow valley above the village. This structure was designed to hold back a flood two and one-half times the size of the record waters of 1942.<sup>43</sup> When the National Park Service and the United States Fish and Wildlife Service reviewed the Corps plans, they recommended that the size of the dam be increased to provide a more adequate pool for conservation purposes. Consequently, the completed dam was 122 feet high and 1,600 feet long with 24,650 acre feet of storage and a total capacity of

The Eau Galle dam, completed in 1969, provides flood protection for the village of Spring Valley, Wisconsin, in addition to fishing, boating, playground, swimming, and nature trail facilities for area residents.



42,450 acre feet. As the policy of the Corps is to transfer the operation and maintenance of recreational facilities to local control, these accommodations were constructed and turned over to the city of Spring Valley. The lack of sufficient funds caused the city to return control of the facilities to the Corps.<sup>44</sup>

Under the leadership of Mayor Harold Olson the Spring Valley community consented to purchase land and rights of way, to make all highway, bridge and utility alterations, and to prevent the dumping of waste within flood channel limits. Two farm families and two residential homes were relocated. Electrical lines of the Northern States Power Company, a pipeline of the Great Lakes Pipeline Company, telephone lines from the Spring Valley Telephone Company and a county highway were rerouted.<sup>45</sup> A campground, swimming beach, shelter building, picnic area, playground, white pine nature trail, boat ramp and two observation outlooks were designed by the Corps to serve an estimated 25,000 annual visitors to the newly created facility. The total cost of the dam and recreational area was 7.6 million dollars.<sup>46</sup>

## Damming The St. Croix

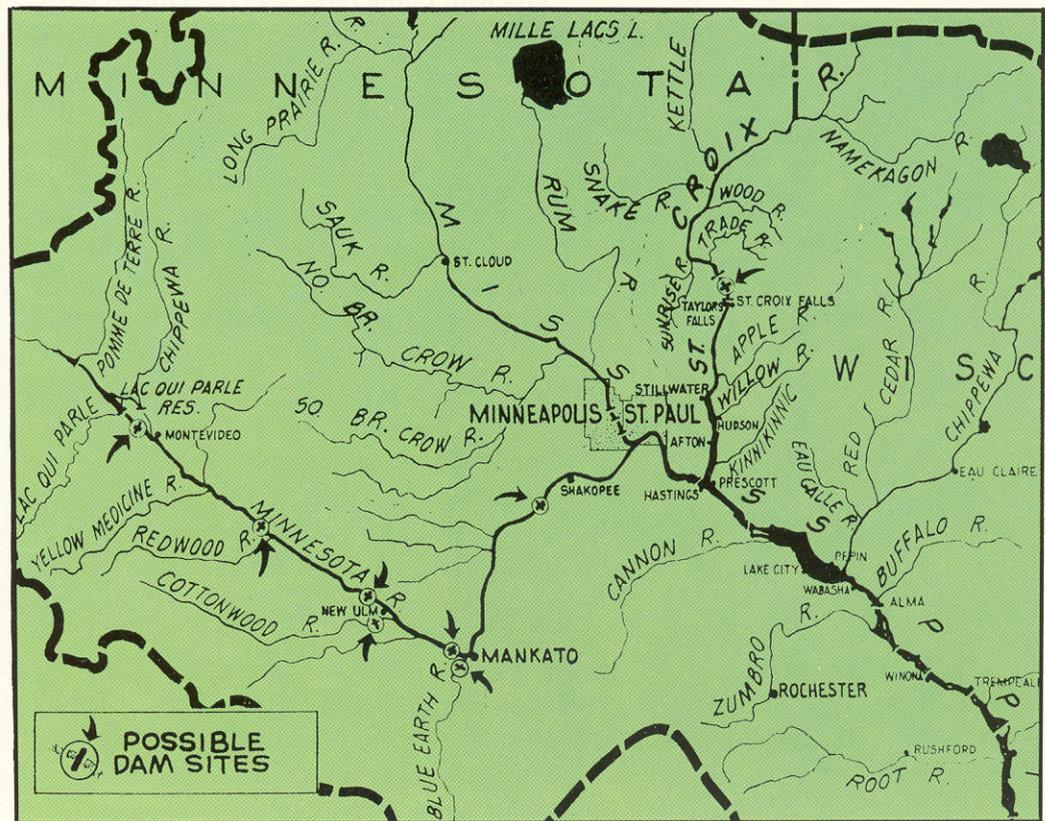
The Eau Galle dam was developed with strong, active local support. In contrast, public reaction was largely negative toward a proposed flood control project for the lower St. Croix River basin. The huge flood of 1965 caused over five and one-half million dollars in damages along the lower St. Croix River, with half of the destruction located in Stillwater, Minnesota.<sup>47</sup> The Corps of Engineers initiated a study of the St. Croix in 1966 under the leadership of Harry Carlson, study manager for the St. Paul District. A companion study of the Minnesota River, where similar destruction had occurred in 1965, was carried on concurrently. These two major tributaries of the Mississippi had contributed greatly to the fifty million dollars in damages downstream. Because there are no possible reservoir sites on the St. Croix (45,000 cfs 1965 flood flow) the only alternative for flood control above Prescott, where the 1965 flood reached a 228,000 cfs flow, was to consider reservoir sites on the St. Croix (45,000 cfs 1965 flood flow) or the Minnesota (80,000 cfs 1965 average flood flow). Seven sites on the Minnesota and two on the St. Croix were considered.<sup>48</sup>

The news that a site on the St. Croix above Taylors Falls was being considered for a reservoir first received

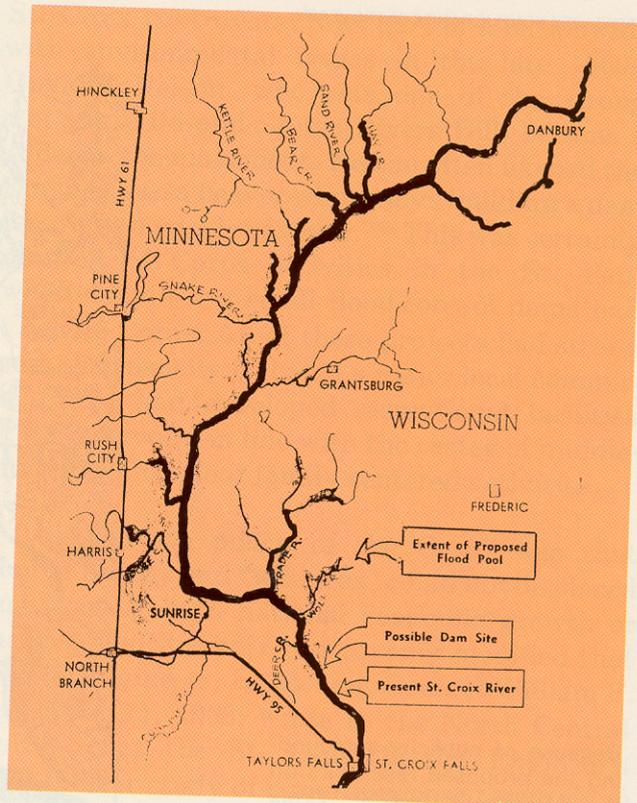
press coverage in March, 1967. The *St. Paul Pioneer Press* was quick to take an editorial stand against a project that might convert the upper St. Croix River into a 114-mile lake covering 75,000 acres of natural woodland. Instead, the *St. Paul* paper supported legislation introduced by Minnesota and Wisconsin congressmen that would preserve the upper St. Croix as a wild and scenic river.<sup>49</sup> Such a law had passed the Senate in 1966 and was waiting for House action.

A year later on March 1, 1968, the Corps of Engineers announced that after a two and one-half-year study, their investigation indicated that a 120-foot dam ten miles above St. Croix Falls was economically feasible. A multi-purpose reservoir would eliminate flooding on the lower St. Croix and would have an effect on the level of the Mississippi as far south as Hannibal, Missouri. The thirty-mile lake on the upper St. Croix would provide for the growing recreational needs of the expanding metropolitan population and would also supply water for Minneapolis and St. Paul, especially when the Mississippi was low. Water for the cities could be lifted to flow through and to maintain the lake levels in the Chisago chain of lakes, and

After the record flood of 1965 the Corps made a study of possible reservoir sites on the Minnesota and St. Croix rivers. The publication of this study produced a series of strong protests by people living along these rivers.

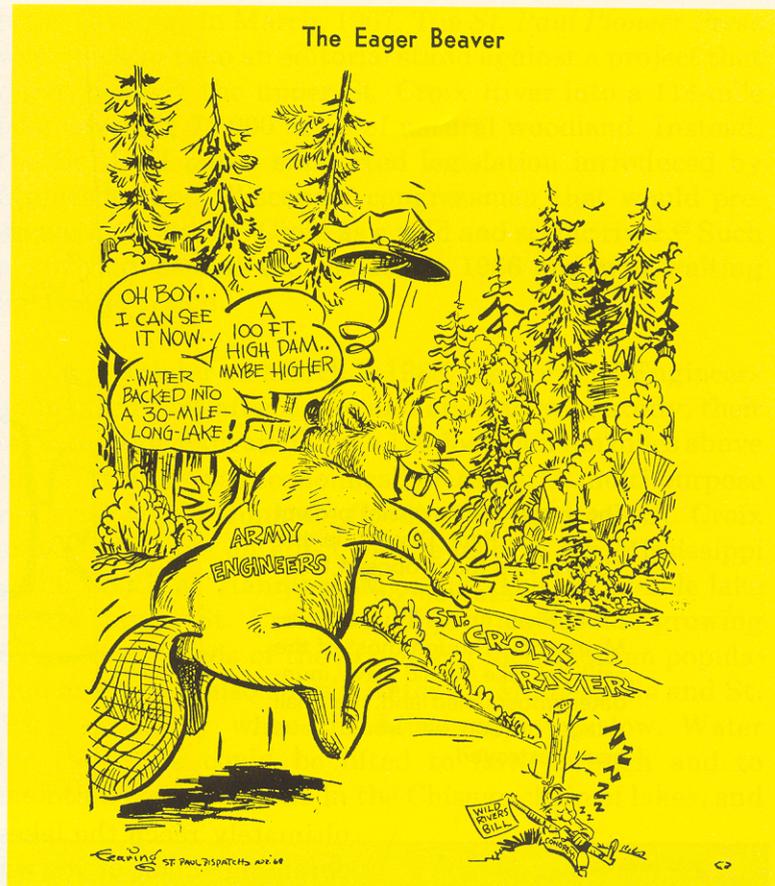


The most controversial project in the St. Paul District in the 1960's was the proposed flood control reservoir on the St. Croix River above Taylors Falls, Minnesota. Though most of the artificial lake would have inundated unoccupied land, the small village of Sunrise would have been destroyed.



ultimately reach the lakes from which St. Paul had been obtaining much of its water supply. The dam also had hydroelectric potential and could supply power for the projected growth of Minneapolis and St. Paul. Because of the underdeveloped nature of the upper St. Croix, the small village of Sunrise would be the only major relocation necessary.<sup>50</sup>

Both the *Minneapolis Tribune* and the *St. Paul Pioneer Press* asked the Corps to abandon the dam idea.<sup>51</sup> The Senate had once again passed the Wild and Scenic Rivers Bill in 1968 and the editors thought that a free-flowing, unspoiled river was more important than another lake to add to the 15,000 or so bodies of water in northern Minnesota and Wisconsin. For protection against a 100-year flood they preferred flood plain management. However, the House bill for wild and scenic rivers did not include the upper St. Croix. Peter Odegard, chairman of the Minnesota-Wisconsin Boundary Area Commission, testified before the House Subcommittee on National Parks and Recreation, asking that the upper St. Croix be included in the legislation. The commission was opposed to building the dam and flooding 75,000 acres of underdeveloped and scenic land.<sup>52</sup>



Because of publicity surrounding the proposed reservoirs on the Minnesota and St. Croix rivers, the Corps of Engineers was tagged with the “eager beaver” image.

Within a month the St. Croix dam had become a major issue. St. Croix Valley newspapers, the metropolitan press and the national media published articles about it almost daily. Environmental groups and local organizations expanded the outcry. Colonel Richard J. Hesse, district engineer at St. Paul, wrote to Representative Joseph E. Karth on March 27 to clarify the issue. He explained that the Corps was not planning any construction at the time and was only completing a study authorized by Congress.<sup>53</sup> At the same time J. Robert Calton, Chief of the District Planning Branch, spoke on the report, “Water Resource Development Planning in the St. Croix River Basin,” at a meeting of the St. Croix Valley Area Chamber of Commerce. He went into detail about three plans under consideration, all of which included reservoirs on the upper St. Croix. Calton emphasized that the upper St. Croix was not in a “natural” state but was a cutover timber district. The heart of his argument, however, was the projected need for water supply, power generation, flood control and recreation in the growing Minneapolis-St. Paul metropolitan area.<sup>54</sup>

The St. Croix controversy was part of a nationwide concern with environmental issues in the late 1960s. Senator Gaylord Nelson, who was one of the strong advocates of the Wild and Scenic Rivers Bill, became a national leader in the movement. Nelson often likened the Corps of Engineers to a beaver who enjoys building a dam "wherever he finds a trickle of water."<sup>55</sup> This was certainly an exaggeration of Corps activities in the St. Paul District, where only a few small flood-control dams had been built by the Corps. All of these projects had strong local support that usually included a major local commitment. The Corps had developed recreational facilities at most of its reservoirs in line with the tastes of middle-class Americans for outdoor family-centered activities.

Prior to 1968 the policy of the Corps was that preservation of beauty and "wildness" could not be placed on an equal footing with national economic growth or regional needs. The St. Croix controversy modified that policy. Chief of Engineers, Lieutenant General William F. Cassidy, on April 11, 1968, wrote to the North Central Division office that the St. Paul District Engineer's emphasis for further study of a multipurpose reservoir on the St. Croix River was "not desired." Cassidy suggested that the Department of the Interior should provide for further study and that the Soil Conservation Service should be requested to participate. He emphasized that the Corps should "demonstrate its capability as a competent, objective national planner in the public interest," exercising "its leadership abilities in bringing together federal, state, local and private agencies into an integrated, cooperative planning body." Above all, the St. Croix study should be comprehensive in scope and must place "on an equal basis economic development and environmental preservation as a Wild or Scenic River."<sup>56</sup>

Colonel Hesse began immediately to implement this policy change. He appeared on local television with environmentalists, discounted the need for a reservoir and asked for comprehensive planning before any decisions were finally made. He quoted a letter from the chief of engineers to Representative Wayne N. Aspinall, chairman of the House Committee on Interior and Insular Affairs, that stated the "nation can afford to forego the development of streams of unusual natural beauty."<sup>57</sup> Aspinall's committee had been holding up passage of the Wild and Scenic Rivers Bill.

Unfortunately, the staff of Representative Karth discovered that correspondence between the Office of the Chief of Engineers and Aspinall also contained other information. They found that the chief's office had requested the committee chairman to eliminate the St. Croix from the list of wild and scenic rivers until further studies could be made.<sup>58</sup> Karth considered this "most discourteous, completely unwarranted, and perhaps unethical" and he demanded that the Department of the Army cease its effort to circumvent "legitimate legislative efforts" and to withdraw any private requests it had made in a "blatant interference with the legislative process."<sup>59</sup> Four days after this disclosure the division engineer, Brigadier General Robert M. Tarbox, and Colonel Hesse met with Charles H. Stoddard, regional co-ordinator for the Department of the Interior. Tarbox emphasized at the meeting that a final decision would not be made on "optimum economic alternatives."<sup>60</sup> Interior Department officials refused to participate in any study of the river until the House had made a decision on the Wild and Scenic Rivers Bill.

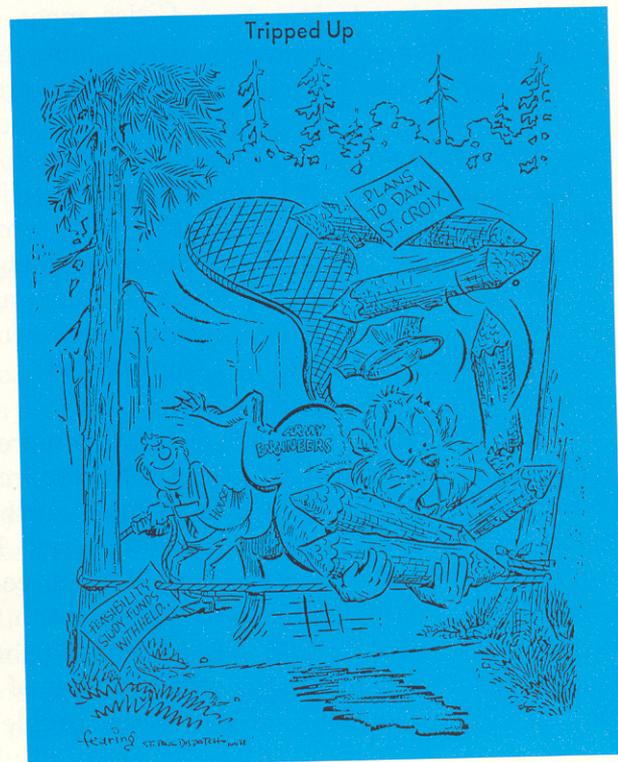
Between 1966 and 1968 the Corps had spent \$58,000 on its study of the St. Croix and had estimated that a total of \$100,000 would be needed to complete it. Thus, the next phase of the conflict centered in the House Appropriations Committee where additional study funds were under consideration. Senators William Proxmire, Gaylord Nelson and Walter Mondale all were opposed to providing additional funds.<sup>61</sup> The district tried to counter this congressional opposition by writing a letter of information on May 21 to all governors, senators and congressmen in the states of Illinois, Wisconsin, Minnesota and Iowa, explaining the Corps position that additional data and a comprehensive study were necessary for Congress to arrive at a just decision.<sup>62</sup>

The reply of Governor Warren Knowles of Wisconsin to this plea received wide press coverage.<sup>63</sup> His letter of June 3, 1968, stated that the key factor was time. Comprehensive studies would delay action and allow for further destruction of a beautiful natural resource. Knowles claimed that such a study could only provide more economic arguments, for man had not devised a method by which "beauty, solitude, wilderness, aspiration, fish and wildlife" could be put on a scale with the dollar bill. He quoted from Luna Leopold of the United States

Geological Survey: "If we want a particular canyon, a rare species of bird, or a particular valley to be preserved because of its scenic beauty when threatened by some other use, strictly economic comparisons will seldom result in its preservation. The reason for this is that we have not found, and in my opinion we should stop looking for, ways of placing dollar values on scenery, on recreation, on that intangible mental well-being which we associate with beauty."<sup>64</sup> On June 18, 1968, the *St. Paul Pioneer Press* reported with some satisfaction that the House Appropriations Committee had turned down the Corps request for further study funds for the St. Croix in fiscal year 1969.<sup>65</sup>

On June 28 a new factor entered the situation. Much of the land along the upper St. Croix had remained undeveloped because it was the property of the Northern States Power Company (NSP). The company had operated a dam at St. Croix Falls since 1906. NSP offered to give the federal government 14,000 of the 30,000 acres it owned in Wisconsin and Minnesota. This tract amounted to 100 acres per mile of river-front and extended 450 feet back on each side of the river.<sup>66</sup> At the same time, NSP produced and distributed a film entitled "Waters of the St. Croix" which celebrated the natural beauty and wildlife in the area.

The passage of the Wild and Scenic Rivers Act by Congress in October, 1968, ended the controversy over a dam and reservoir on the St. Croix River.



During the first week of August the *Minneapolis Star* published a survey which indicated that thirty-two percent of Minneapolis residents and thirty-five percent of St. Paul residents were in favor of the dam on the St. Croix, while forty-six percent in Minneapolis and forty-one percent in St. Paul opposed the dam.<sup>67</sup> The downriver papers were also split on the issue. Stillwater vigorously supported the reservoir concept, while the *Winona Daily News* and the *Red Wing Daily Republican Eagle* favored the wild river designation.<sup>68</sup> Representatives John Blatnik, Donald Fraser and Joseph Karth worked in the House for wild river legislation as Gaylord Nelson, Walter Mondale and William Proxmire had in the Senate. In November, 1968, the Wild and Scenic Rivers Bill finally passed and the St. Croix River along with its major tributaries was one of the first eight rivers to be preserved in its free-flowing, unpolluted condition. The 235 miles of the upper St. Croix became the longest wild and scenic river in America. Seven years later a master plan for the lower fifty-two miles of the St. Croix was developed to halt further commercialization and this stretch of river was added to the list of national recreational waterways.<sup>69</sup>

The struggle over preservation of the St. Croix was much more than a victory for environmentalists, the Twin Cities mass media, citizens of Taylors Falls, St. Croix Falls and the little village of Sunrise. The Wild and Scenic Rivers Act was part of a larger struggle which ended in the formation of another new governmental bureaucracy, the Environmental Protection Agency. Into the competition of federal agencies responsible for water resources came a new power. The result was not only that agencies such as the Corps of Engineers have to prepare environmental impact statements for every proposed planning for the whole Mississippi River Basin was again forestalled.

One more regulatory agency now had jurisdiction over water resource planning. District Engineer Hesse tried to make such planning the main issue in the St. Croix controversy. He failed. The Department of the Interior would not cooperate. The director of planning for the Metropolitan Council, Robert C. Einsweiler, argued for a planning principle, not for forming one co-ordinating agency out of the 180 different units dealing with water-related problems in the Twin Cities area.<sup>70</sup> As a result, the basin studies of the upper Mississippi River and its

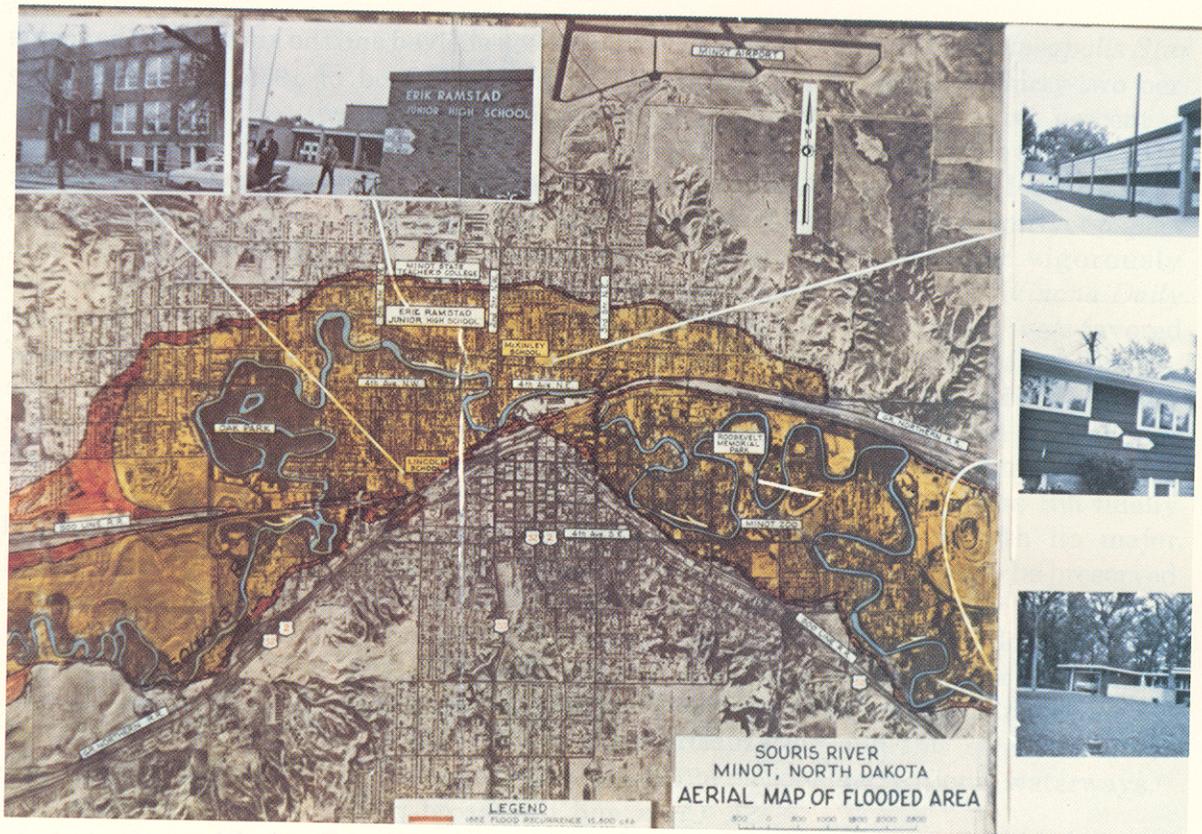
tributaries have been shelved and the knowledge that came from studying the great flood of 1965 appears to have little chance of being implemented.

There is little doubt, however, that in the St. Croix controversy the image of the Corps of Engineers was greatly damaged by the flood of newspaper articles, political speeches and environmentalist accusations. Not only was the image subsequently changed, but the whole internal structure was transformed. The Corps of Engineers' mission was redefined in the 1970s to include the preservation of "important historical, cultural, scenic and natural aspects of American life;" "to arrest and abate the degradation and deterioration of our physical, biological and cultural environment;" "to apply non-structural solutions wherever practical;" and to "consider a full range of alternatives to solving man's problems and meeting his needs."<sup>71</sup>

## Burlington—A Dry Dam

The decision to curtail plans for a reservoir on the St. Croix and the forced postponement of studies for a similar reservoir on the Blue Earth River affected the design philosophy in the St. Paul District office. A renewed sensitivity to the environment and the rights of individuals, as well as a comprehensive search for flood control design alternatives, began to emerge in the 1970s.

This environmental approach to planning can be chronicled in the recent history of flood problems on the Souris River at Minot, North Dakota. Minot is a small city with a population of 35,000 serving a large area of ranchers and grain farmers. The Souris (or Mouse) River makes a 358-mile loop through this north-central North Dakota region. It originates in Saskatchewan, Canada, winds its way south through Minot to near Velva and then turns north to Manitoba and eventually empties into the Assiniboine River. The Souris is 729 miles long with thirty-eight percent of its semiarid drainage area in the United States. About ninety-three percent of this river basin consists of cropland, pasture and range. The record flow of 1904 sent 12,000 cfs of water through Minot. Between 1904 and 1969 the Souris only occasionally caused Minot problems. However, since 1969 this quiet stream has produced serious inundations in five out of nine years.<sup>72</sup>

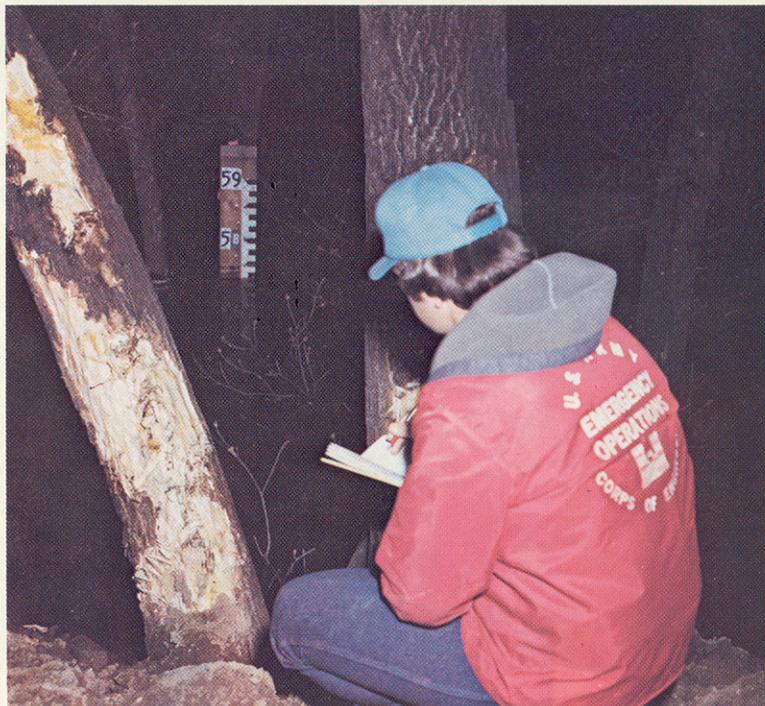


The Souris River flood plain became well known to city officials of Minot, North Dakota, as they fought major floods in 1969, 1972, 1974, 1975 and 1976.

In the great flood of 1969 which caused extensive destruction throughout the St. Paul District, Minot sustained the greatest damage. The city was totally unprepared. Though the Corps and the Weather Bureau were accurate in predicting flood crests elsewhere, the lack of information about the Souris in Canada gave the city of Minot less than a week to prepare for the second largest flood on record. Over half of the city's structures were on the flood plain. It was necessary to evacuate 12,000 people and provide emergency levee protection for a nursing and retirement home, four schools, five sanitary lift stations and six of the city's wells.<sup>73</sup> Only the existence of Darling Dam, a reservoir built by the United States Fish and Wildlife Service thirty miles upstream from Minot, prevented a flow equal to that of 12,000 cfs experienced in 1904. The peak flow of 6,000 cfs on April 19 caused \$18,114,300 in damages in the Souris Valley, \$10,918,700 of which were in Minot. The evacuation emptied 3,000 of Minot's 8,000 residences. Over 7,000 people in addition to those earlier evacuated were forced out of their homes by rising water. In August 300 homes were still vacant.<sup>74</sup>

A year later the Corps and one of its chief flood fighters, Myron F. Tiemens, were back in Minot helping with another flood fight. This time 5,620 people rallied to fill 350,000 sandbags. The Corps, working under Tiemens, flood emergency area engineer, awarded \$1,046,000 in contracts to make five channel cuts totaling 3,100 feet and to shorten the river 4.1 miles. It also employed 472 pieces of equipment to dump 131,600 cubic yards of fill on emergency dikes. A notice went up outside of town welcoming people to "Flood City."<sup>75</sup> The sign was prophetic; similar flood fights confronted Minot in 1972, 1974, 1975 and 1976. In 1975, for example, the Souris crested at 5,000 cfs on May 6 at Minot. The Corps assigned

Practically every one involved in a flood emergency is concerned with the water gauge charts. Each reading determines the hour-by-hour activity of every unit and person responsible for maintaining the flood fight.



The temporary levees constructed during the 1976 flood in Minot helped to save some of the property along the flood plain.





The Darling Dam on the Souris River above Minot was built by the United States Fish and Wildlife Service to provide a wildlife refuge. Though it was not designed as a flood control structure, it has helped alleviate flood problems in Minot.

twenty-eight employees there to help co-ordinate all flood control activities including evacuating 3,000 people, awarding forty-seven contracts for two million dollars in emergency projects and supplying twenty pumps and 235,000 sandbags.<sup>76</sup> James Ruyak, chief of construction for the St. Paul office, spent thirty-eight consecutive days co-ordinating the 1975 "Battle of Minot." At one point he ordered all dikes to be raised two feet in eighteen hours, an action that saved much of the city from serious loss. Ruyak became a household word in Minot. A year later an even more serious flood developed with the river cresting at over 10,000 cfs on Easter morning. Ruyak again led the fight. A street was named after him and in the spring of 1976 the governor, mayor and other officials presented Ruyak with six state and regional awards for helping to save the city from thirty million dollars in destruction.<sup>77</sup>

Studies for permanent flood control at Minot began in 1949, when a public hearing was held and local citizens asked the Corps to consider constructing a reservoir above their city on the Souris. When a preliminary examination on the feasibility of such a project was sent to the Office of the Chief of Engineers in 1950, the Bureau of Reclamation requested that further Corps work be held in abeyance until the bureau could complete its study of a possible Missouri-Souris diversion project.<sup>78</sup> In 1956 the bureau informed the Corps that it was no longer considering the diversion plan north of Minot and in 1958 a resolution of Congress reopened the Souris flood control study. At a public hearing in 1960, strong local support was expressed, and dam sites were examined.<sup>79</sup>



James Ruyak, a Corps engineer, has practically taken up residence in Minot, where he has been honored many times for his expertise and devotion to helping the flood-stricken city. On the left is Mayor Chester Reiten, who has worked closely with the Corps in an attempt to find a permanent solution to Minot's flood problems.

In 1963 two groups came out in opposition to a new dam. The United States Fish and Wildlife Service registered its concern about the adverse effects such a reservoir would have upon Darling Dam. Ranchers upstream worried about loss of good grazing land, and asked the Corps to consider other alternatives, including Canadian reservoirs.<sup>80</sup> Though many of the Fish and Wildlife Service's questions were resolved in a meeting on April 17, 1964, a negative reaction from Canada in 1965 left the whole reservoir question an unresolved issue.

Flood control matters were thus stalemated in 1969 when the great flood hit Minot. Within a year the Corps study was completed recommending channel improvement

through Minot and an eighty-five-foot dam near Burlington. A delegation of local leaders headed by City Manager Vernon Fahy and Mayor Chester Reiten went to Washington in the spring of 1970 to testify in favor of building the project in two stages.<sup>81</sup> The first stage would widen, deepen and shorten the river channel through the city of Minot in order to handle a flood of 5,000 cfs. The second stage consisted of a reservoir on the Souris above Minot to provide the additional protection needed. Senators Milton Young and Quentin Burdick and Representatives Mark Andrews and Thomas Kleppe arranged for the group to appear before House and Senate committees. While the delegation testified, the Souris again began to overflow and part of the delegation rushed home to fight the flood.

While some returned to North Dakota, another group from Renville County, North Dakota, arrived in Washington. This delegation, led by E. C. McCarroll, voiced strong opposition to a dam project.<sup>82</sup> Ralph Christensen, president of the Ward County Water Management District, tried to reason with these individuals. Christensen, a calm and mature leader, discovered that these project opponents would not compromise on anything less than total evacuation of businesses, churches, schools and private homes on the flood plain.<sup>83</sup> Minot citizens felt otherwise and voted by an eighty-eight percent margin in November to provide 1.3 million dollars in matching funds for the channel improvement project.<sup>84</sup> Congress also backed the majority and approved nearly a million dollars for channel construction.

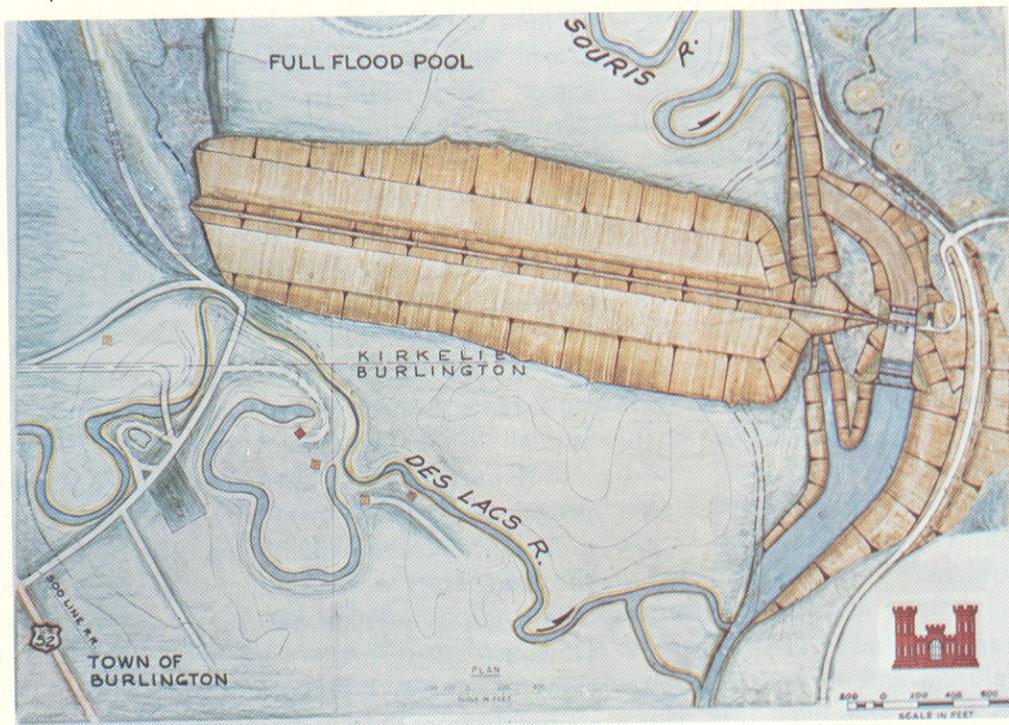
In October, 1971, Roger Fast from the Corps office posted a thirty-five-foot map of the Minot section of the Souris River on the walls of the Minot city council chamber and explained the construction plans for phase one. The Ward County Water Management District had agreed to take over maintenance of the project after completion.<sup>85</sup> The Souris River Flood Control Planning Committee met numerous times during 1972 with Corps engineers to consider eight or nine alternatives to the reservoir for protecting Minot from the possibility of another 1969 battle. It was evident that the city could not rely only upon flood insurance, flood plain zoning, levee building, channel improvements and floodproofing to combat a possible sixty-five million-dollar flood. Diversion plans were considered and found to be too expensive and

impractical. The cost of flood plain evacuation had risen from a preliminary estimate of fifty-two million dollars (in 1967 dollars) to over 170 million dollars. A dam and reservoir seemed to be the only practical alternative.<sup>86</sup> However, all three possible dam sites would produce adverse environmental effects on fishing, waterfowl nesting, range grasses, flood plain forests and wildlife, as documented in an environmental impact statement published in September, 1972.

J. Robert Calton proposed a unique solution in November, 1972. He suggested that a "dry dam" design should be considered. Such a structure would be operated in conjunction with a 5,000 cfs channel at Minot. The reservoir would have a storage capacity of about 600,000 acre feet, backing water to near the international border. Calton estimated that the dry dam would only be used once every thirty-five years. The estimated cost was forty-five million dollars and the project had a cost-benefit ratio of 1.9. This was very high, as 1.0 is considered adequate for economic feasibility.<sup>87</sup>

Though the Corps of Engineers and many of the citizens of Minot would like to see a reservoir built to control flooding, the ranchers owning the land have expressed strong opposition. One alternative under consideration is making the flood control structure at Burlington into a dry dam.

Plans were developed for such a project and in February, 1974, the design was made public. It included channel improvements and a dry dam reservoir at Burlington. The dam's location was planned so the maverick



Des Lacs River could also be diverted into the reservoir. The project necessitated the displacement of eighty summer homes, the disruption of thirty-three ranches, the relocation of McKinney Cemetery, the purchase of 1,500 acres of privately owned land and the acquisition of flowage rights on or purchase of another 5,700 acres.<sup>88</sup>

Opposition to the dry dam quickly appeared. Paula Ward and Richard Harp of the Izaak Walton League appealed to the North Dakota Water Commissioners to halt the project.<sup>89</sup> The Bureau of Sport Fisheries and Wildlife, now the U.S. Fish and Wildlife Service, expressed a desire to enlarge Darling Dam instead of building a new reservoir which could inundate their facility during a 100-year flood, requiring extensive mitigation of drained wetland.<sup>90</sup> Canadian officials registered their concern that the structure might cause water to back up into Canada.<sup>91</sup> Those living downstream feared that the combined effect of the 5,000 cfs channel and the elimination of the Minot flood plain would increase downriver crests.<sup>92</sup> The Sierra Club voiced opposition to the disruption of the natural environment.<sup>93</sup> The Democrats of North Dakota's Second Congressional District at their convention in June, 1974, endorsed the 5,000 cfs channel at Minot but reiterated the conviction that "the only solution for complete flood protection in Minot is evacuation of the flood plain."<sup>94</sup> Others asked that the size of the dry dam be reduced. Corps engineers explained that in such engineering decisions they could never compromise, for an inadequate structure "would give people downstream a false sense of security."<sup>95</sup> Douglas M. Newlin of Midwest Research Enterprises came to Minot from Rapid City and asserted that the only solution to a great flood disaster like that of 1972 along Rapid Creek in South Dakota was complete evacuation of the flood plain.<sup>96</sup>

Mayor Reiten expressed amazement at the opposition. He had thought that the concept of a dry dam would appeal to upstream ranchers, farmers, environmentalists and fish and wildlife agencies.<sup>97</sup> In Ward County both the president of the Farm Bureau, Lynn Martin, and the president of the Farmers' Union, Vernon Carlson, opposed the dam. They were indignant that farmers would receive only one payment of \$16.70 an acre for flowage rights.<sup>98</sup> Downstream farmers were not promised any compensation. These North Dakota farmers valued land more than money. Lynn Martin testified, "My farm is not for sale.



Lem Kaercher, publisher of the *Ortonville Independent*, has been the major force behind the development of the Big Stone-Whetstone River wildlife and flood control project. In spite of twenty years of dedicated work and promotion, his ultimate goal of stopping the eutrophication of Big Stone Lake has yet to be realized.

Even if you offered me \$1000 an acre, I would say, 'No thanks, I want to keep my land.'"<sup>99</sup>

The Burlington dam controversy has not yet been resolved. Although the initiative in promoting the construction of the dam was taken by the city of Minot, not the Corps, the St. Paul District has taken responsibility for channel improvements within Minot which will provide protection against intermediate-sized floods like those which have plagued the area in recent years. It has also provided a recreational design whereby six parks along the river front will be developed for a variety of leisure activities. Corps officials have worked closely with the Minot Park Board to obtain funding so this plan can be implemented.<sup>100</sup> But the larger issue of how to prepare the community for a 100-year flood has not yet been decided.

## Big Stone—Whetstone Project

Another example of contemporary Corps planning and environmental design is the reservoir and dam near Odessa, Minnesota, which was dedicated on June 7, 1974. This structure is listed as a flood control project, but that is only one of the many functions it serves. The nine and one-half million dollar project was a composite creation of many local, state and federal agencies under the leadership of Corps engineers and the unflagging devotion of one newspaper editor, Lemuel A. (Lem) Kaercher of Ortonville, Minnesota.<sup>101</sup>

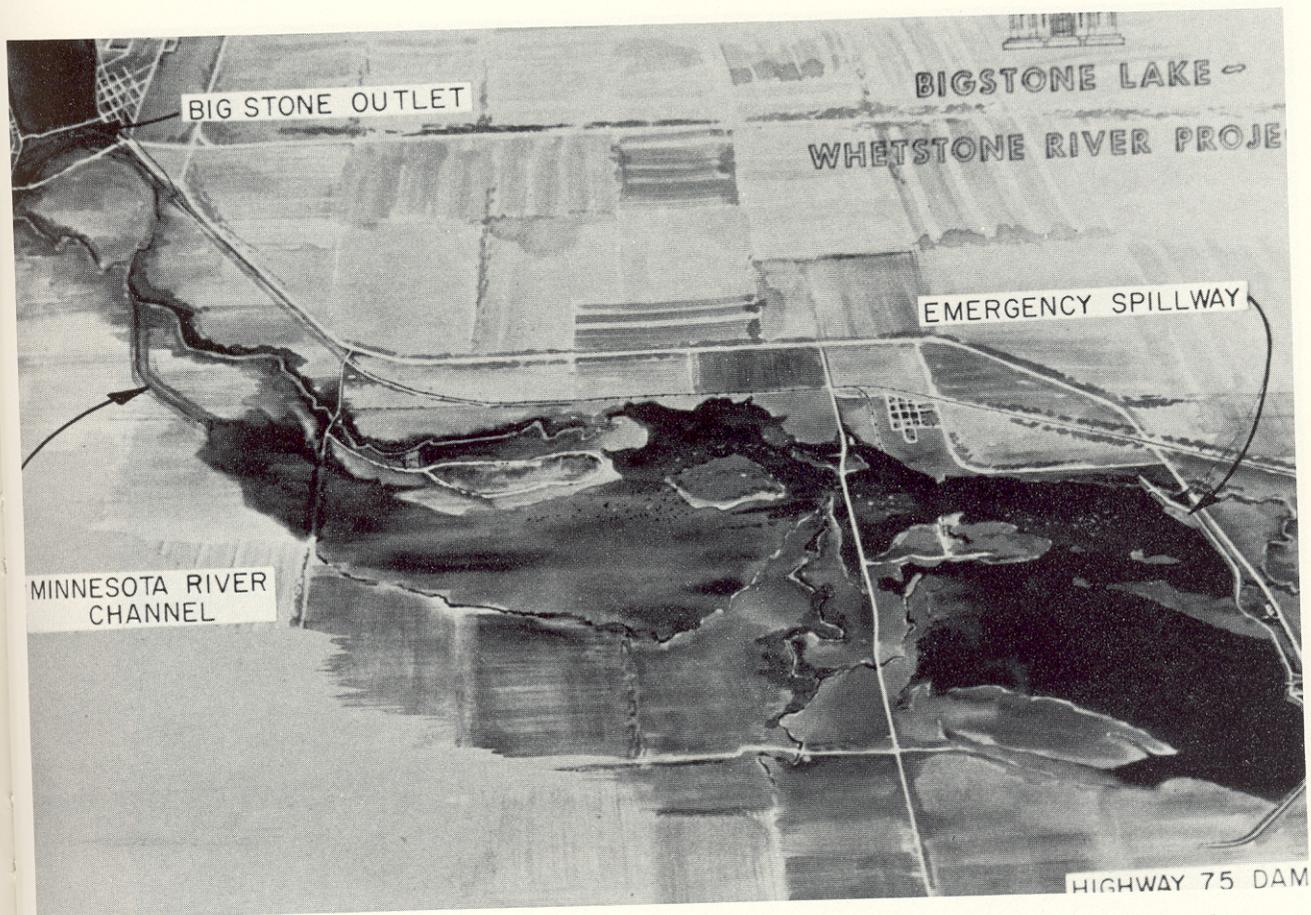
In October, 1955, Lem Kaercher called a meeting in Ortonville of congressional representatives, Corps officials, legislators from Minnesota and South Dakota, the chief of planning and development from the Soil Conservation Service and the local citizens.<sup>102</sup> One of the problems discussed was the flooding of residential lake homes and farmland downstream from Big Stone Lake. The major concern of publisher Kaercher was the advanced eutrophication of the lake. Big Stone, a border lake between Minnesota and South Dakota, is twenty-six miles long and a mile and a half wide. At one time it was a popular resort and fishing area serving a large region in western Minnesota and eastern South Dakota. Because of rapid pollution due to silt and nutrients from farm feed lots and other run-off of agricultural, municipal, industrial and resort wastes, the lake turned sour. The resultant weed and algae growth, the decline of game fish population and the sordid appearance and sickening smell of

the green scum had a depressing effect upon the quality of life in Ortonville and Big Stone City, South Dakota.<sup>103</sup>

One of the major reasons for the deterioration of Big Stone Lake was reported to be the diversion of the Whetstone River. During the 1930s when the lake dropped to a record low, the State of Minnesota with federal funds supplied by the Works Progress Administration built a dam across the Minnesota River at the lower end of the lake, diverting the waters of the Whetstone River into Big Stone Lake. Within twenty years after the completion of this project in 1937, the dam apparently diverted not only the desired water but also large amounts of fertile sand and silt so that the lower end of Big Stone Lake became too shallow for recreational craft. The once beautiful blue waters periodically became covered with slimy green algae.<sup>104</sup>

The obvious solution to the problem was to redirect the Whetstone River back into the natural drainage channel of the Minnesota and dredge the accumulated silt out of Big Stone Lake. However, this was a costly project which brought up many environmental questions. Studies were requested from the Fish and Wildlife Service, the Minnesota Department of Conservation and the Minnesota Highway Department. While these aspects of the problem were under study, the area experienced the unusually high water of the 1960s. The flood of 1965 on the Minnesota raised the question of whether alterations on the Whetstone River would have serious effects on the Lac qui Parle reservoir below, or adversely affect the agricultural production of downstream sections.<sup>105</sup>

The Corps was authorized by the Flood Control Act of 1965 to make a formal study of the problem. In October, 1967, a local group, the Upper Minnesota River Watershed District, was created to provide local contributions and assure future maintenance of the project. Lem Kaercher used his *Ortonville Independent* to expose rumors and provide full coverage of every decision and problem faced by the state and federal agencies involved. For fifteen years Kaercher scheduled meetings, flew to Washington to appear before committees, went to St. Paul to meet with state and federal officials and kept local interests involved in the project. He was very successful in getting funds appropriated for each phase, often before agencies were prepared to spend the money.



A conservation pool covering 11,000 acres has been created by closing off the Minnesota and Yellow Bank rivers below Ortonville in western Minnesota. The project was started in June, 1972, and completed in August, 1974.

The plan which eventually evolved called for the creation of another lake! This body of water became an 11,000-acre national wildlife refuge southeast of Big Stone Lake. Twenty-three families were displaced from a marsh and flood plain area and a two million dollar dam was built to create a conservation pool twelve feet deep and filled with many small islands. The reservoir was on the migration route for many ducks, geese and other birds. The project also included three miles of channel improvements on the Minnesota below the outlet of Big Stone Lake, the construction of public use facilities on the new lake, the relocation of roads and utilities and the alteration of the existing silt barrier and control structure on the Minnesota River.<sup>106</sup> Many delays in the project were encountered, including a court fight by rural residents in Traverse County, who did not want to be included in the Upper Minnesota River Watershed District.<sup>107</sup> The United States Fish and Wildlife Service agreed to manage the wildlife refuge, while the Corps of Engineers retained the responsibility for funding the operation of the two dams to control water levels and to meet flood control needs.

Two major problems were faced by the project engineer, John W. Forsberg, during the construction of the Big Stone-Whetstone dam. Three large public utilities (Ottertail Power Company, Northwestern Public Service Company, Montana-Dakota Utilities) began to build a large electrical generating plant outside Big Stone City, South Dakota, on land west of the lake. In 1970 they requested that an outlet control structure be built in order to guarantee adequate water supply for cooling systems in the proposed power plant. The public utility companies were willing to pay the additional costs of \$194,000 for building the structure.<sup>108</sup> However, the chief of engineers informed Colonel Rodney Cox that the federal government had no authority to accept funds from private corporations.<sup>109</sup> Thus, the request and payment of costs had to be channeled through a state agency, the Upper Minnesota River Watershed District. The structural addition to the dam was finally approved in November, 1973. The second problem concerned silt deposition and soil erosion from the Yellow Bank River and Whetstone River above the project and from the Minnesota River below the new reservoir outlet. Questions about the erosion control works were never answered to the satisfaction of conservationists, engineers connected with the project or landowners in the area.<sup>110</sup>

When the dam was dedicated in 1974, Lem Kaercher, then eighty-two years old, still had not solved the problem of cleaning up Big Stone Lake. In October, 1975, the district engineer, Colonel Max W. Noah, informed local residents that the Corps of Engineers would not be able to perform any dredging activities within Big Stone Lake. The benefit-cost ratio of 0.4 was too low to justify the work.<sup>111</sup> Though Big Stone area residents understood that the Corps could not legally clean up their lake, people like Lem Kaercher would not give up, for they felt that the federal government "is MORALLY obligated to remove, by dredging, the enormous amount of silt dumped into the lake as a result of the Whetstone Diversion."<sup>112</sup>

The Big Stone-Whetstone Project is a good example of how complex flood control has become, even in a rural area where the inundation of a large urban flood plain is not involved. A maze of federal, state and local jurisdictions controls water resources and the duplication of effort is enormous. Thousands of dollars have been spent on studies of the pollution problems in Big Stone Lake. The work has



The outlet structure of the Odessa reservoir has become a popular fishing spot for area residents.

been comprehensive, but the conclusions have not been fully accepted as a solution to the area problem. Some critics claim that the newly created reservoir at Odessa will itself silt up in fifty years. It will then be much more difficult to hold one group morally responsible for the situation, for everyone from the Environmental Protection Agency to the South Dakota State Water Resources Commission has had a part in the planning and implementation of the project.

## Notes

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