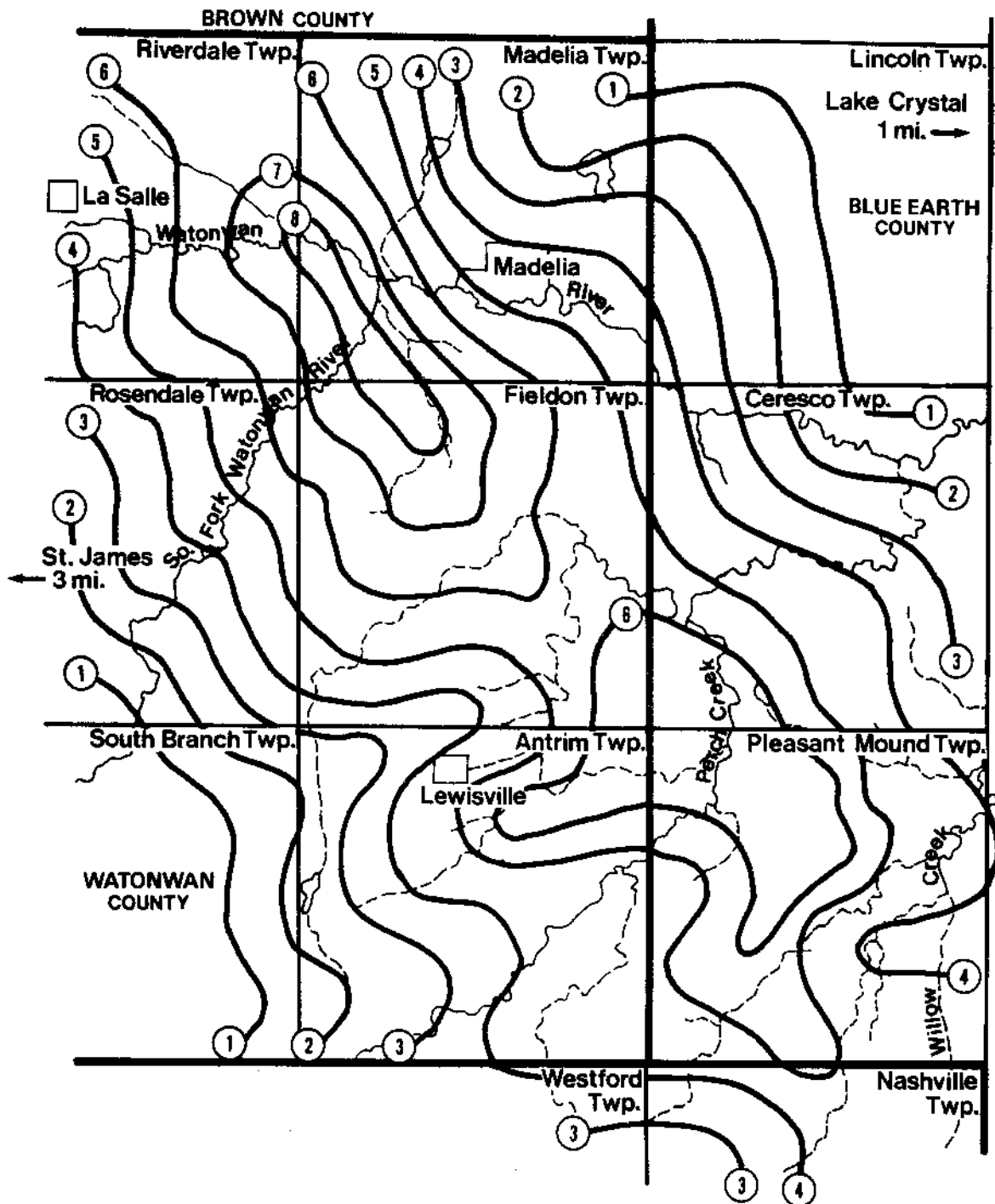
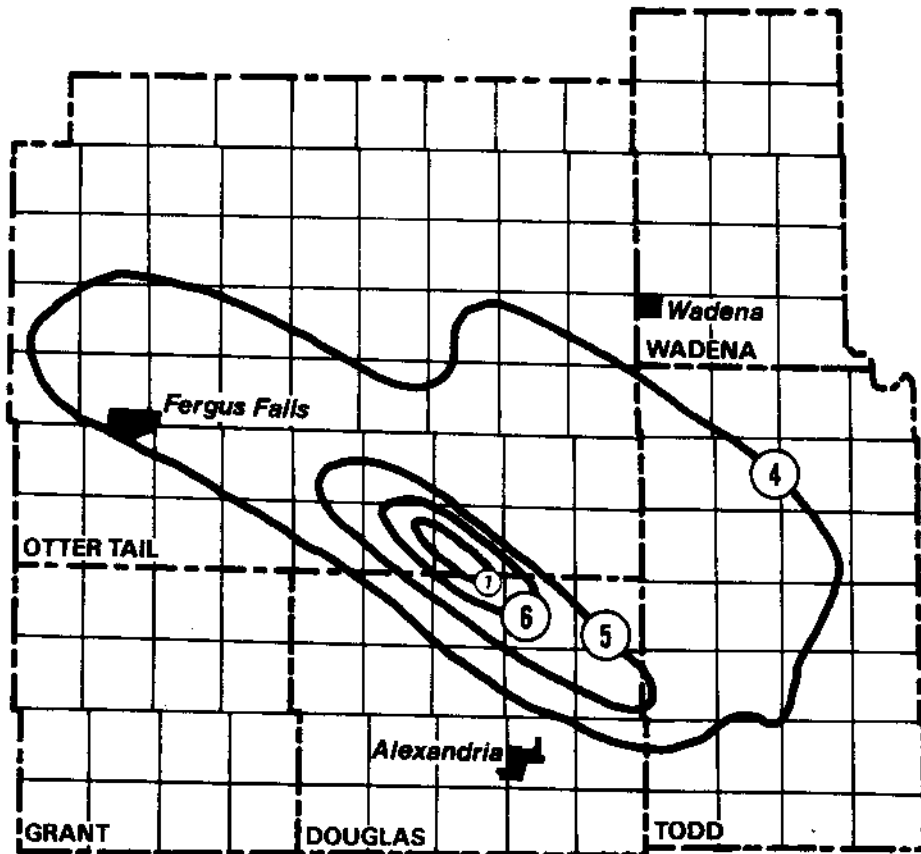


PRECIPITATION – SOUTHCENTRAL MN
June 7-8, 1972



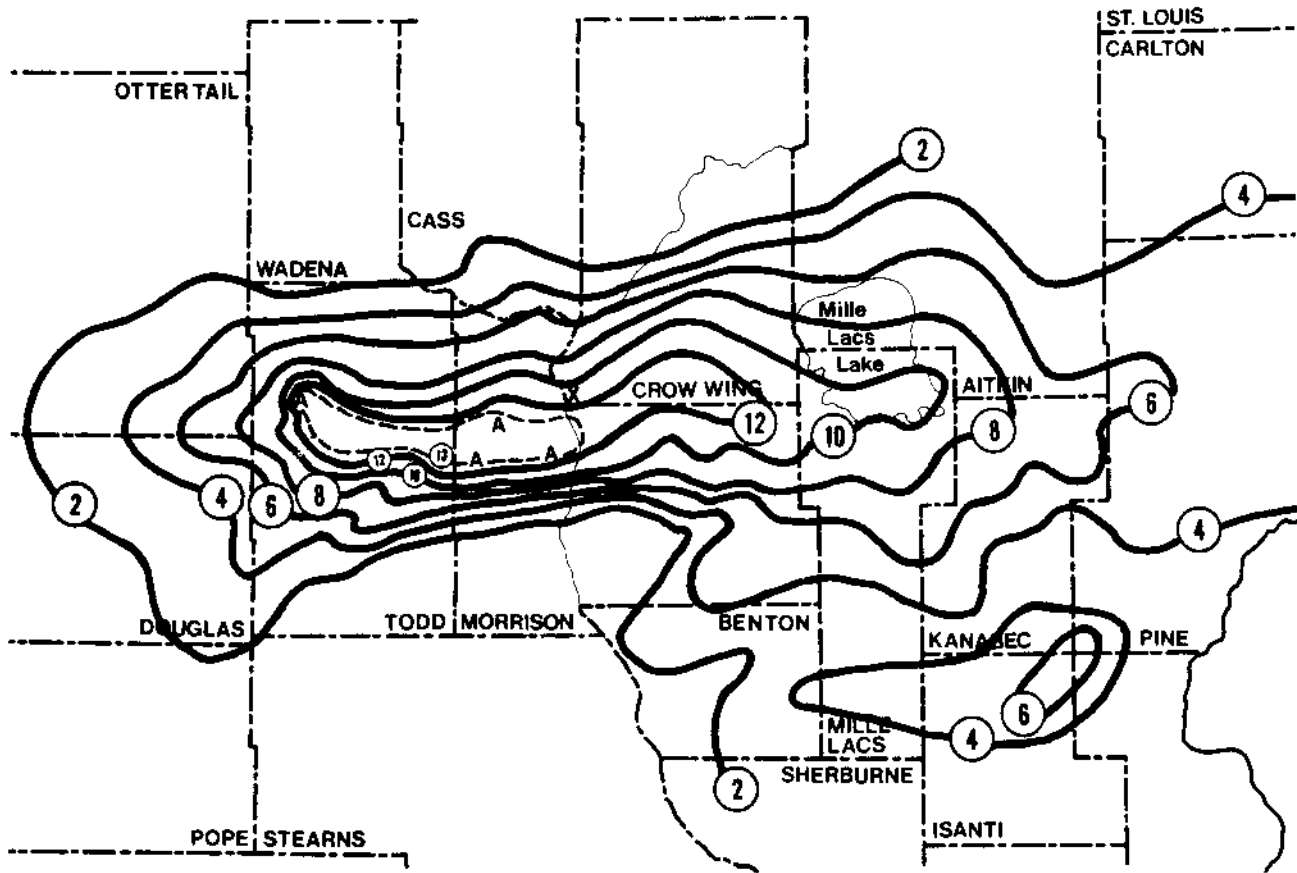
This map depicts the very heavy rainfalls, 5 to 8 inches, which occurred in southcentral Minnesota from about 8:00 PM on the 7th until 3:00 AM on the 8th. However, the 3-inch or more rainfall that caused flood damage across the area started just east of Sleepy Eye and extended south-southeast through Elmore into northern Iowa and generally on a line 10 miles wide. See the June 1972 Storm Data for Minnesota for damage.

FLASH FLOOD
(Ottertail, Douglas, & Todd Counties)
July 11-12, 1972



Flash flood rains began about 7 PM on July 11, 1972 and ended about 1:30 AM on the 12th. The greatest amount recorded was 7.5 inches, 4 miles north of Urbank. The area covered by 4-inch rains and greater was 1,250 square miles.

“GRAND DADDY” OF FLASH FLOODS
(Little Falls)
July 21-22, 1972



MOST DAMAGING FLASH FLOOD IN MINNESOTA'S
HISTORY: July 21st-22nd, 1972

The worst flash flood in Minnesota's history to date started about mid-afternoon on the 21st, in the west along the Otter Tail and Douglas County line and ended about daylight on the 22nd, south of Duluth along the Minnesota-Wisconsin Border. The rains fell generally in an 8 to 10-hour period at any one point. This flood caused the greatest monetary losses ever experienced in the State for a flash flood and also had the greatest 24-hour official rainfall amount ever recorded in Minnesota. Flood damages were estimated at \$20,000,000. The 24-hour rainfall at Fort Ripley was 10.84 inches, exceeding the previous all-time 24-hour rainfall for Minnesota of 10.75 inches on July 20, 1909 (at Beaulieu in Mahnomon County). The isohyet map was analyzed from 245 reports: 15 National Weather Service Cooperative Stations, 15 county civil defense officers' reports and about 210 reports from the Future Farmers of America Rainfall Project, a program organized by the State Education Department and operated by the high school agricultural instructors. These reports make this the most documented heavy rain-storm in the state's history.

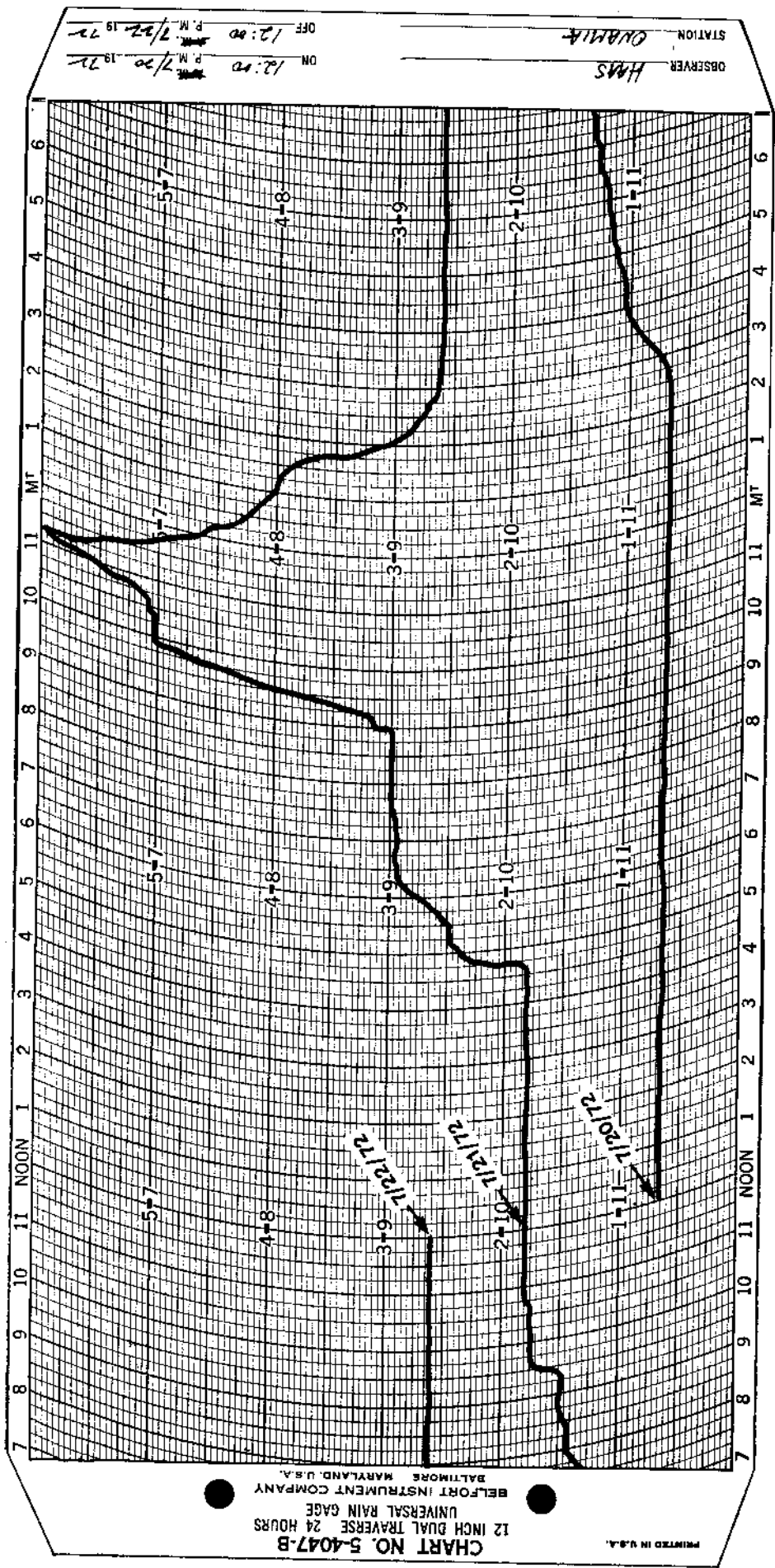


CHART NO. 5-407-B
 12 INCH DUAL TRAVERSE 24 HOURS
 UNIVERSAL RAIN GAGE
 BELFORT INSTRUMENT COMPANY
 BALTIMORE MARYLAND U.S.A.

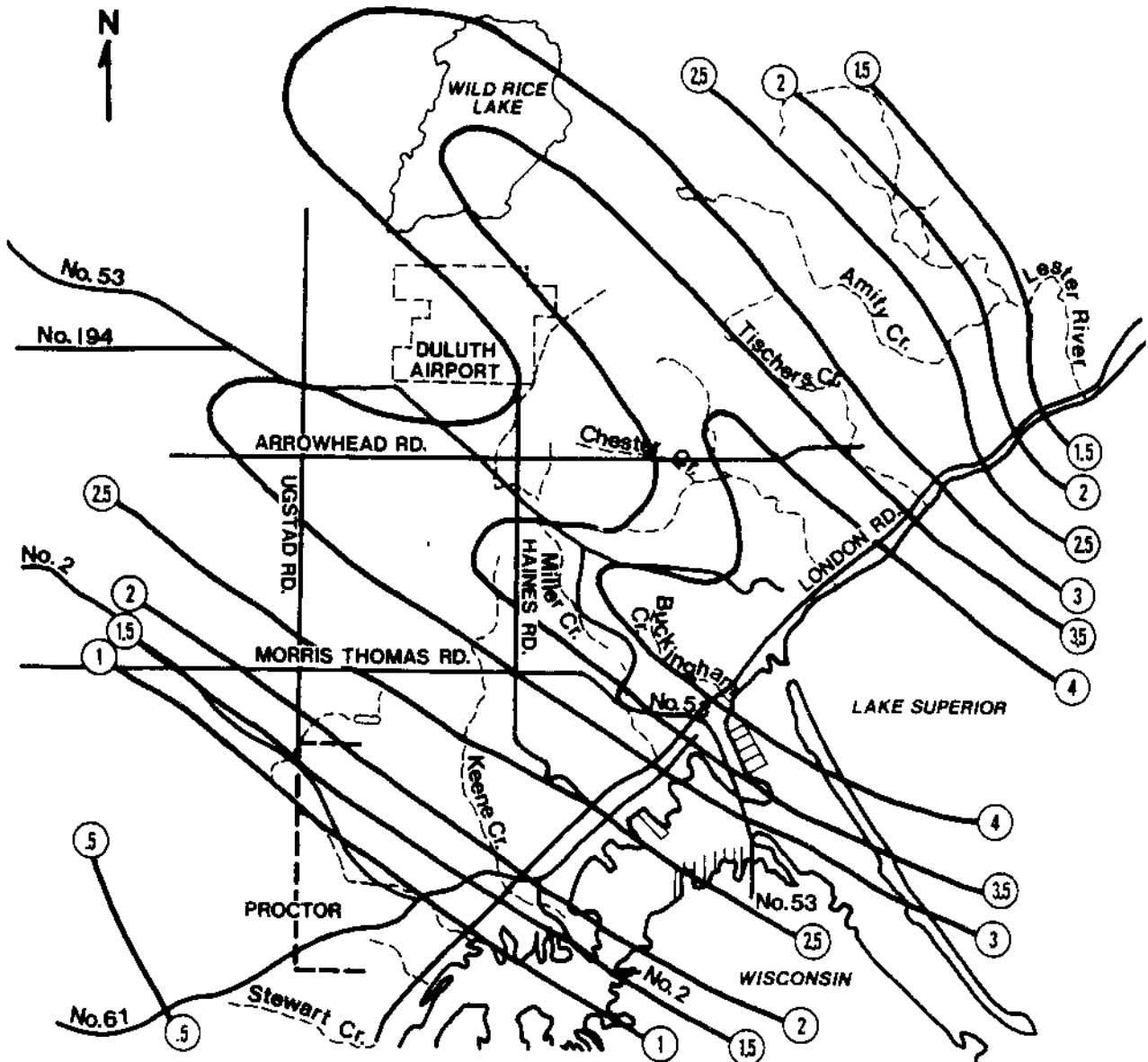
PRINTED IN U.S.A.

The eastern part of the rainfall area is spread out because during the latter part of the day (on the 22nd) additional heavy rainfalls occurred. Thus it was difficult to separate the two storms from each other. An interesting feature on the isohyet map in Morrison County is to compare the distance from 2" to 13" isohyet lines of the southern edge of the storm to the northern edge. The distance on the south is narrow and about $1/2$ that of the north, indicating a sharper edge to the storm on the south. The isohyet map shows the NWS Cooperative Weather Station at Fort Ripley (about 5 miles to the north of the center line of the intense part of the storm) which had in excess of 13 inches of rainfall. The 13-inch or more isohyet line was analyzed from 4 unofficial reports plus several "guess estimates". (The 13-inch locations are noted by "A") The storm probably covered a larger area of heavy rainfall than any other known storm to date in Minnesota. The 8-inch or greater rainfall started at Otter Tail, Douglas and Todd tri-county intersection and extended 90 miles east across Mille Lacs Lake. It averaged about 16 miles in width and the area measured was nearly 1,500 square miles.

Timely weather reports and forecasting coupled with fast action from local, county and state law enforcement and civil defense agencies saved many people from the hundreds of road washouts across the heavy rainfall area. Only one person drowned as he drove his car into a road washout. Every major highway was closed east of Alexandria to the Wisconsin Border, generally, from 3 to 16 days except Interstate 35 between Duluth and the Twin Cities.

Comment: Statistics show that a $5-1/2$ inch 24-hour rainfall occurs at a point in Todd-Morrison Counties once every 100 years in Minnesota. It appears that this July is trying hard to change the statistics.

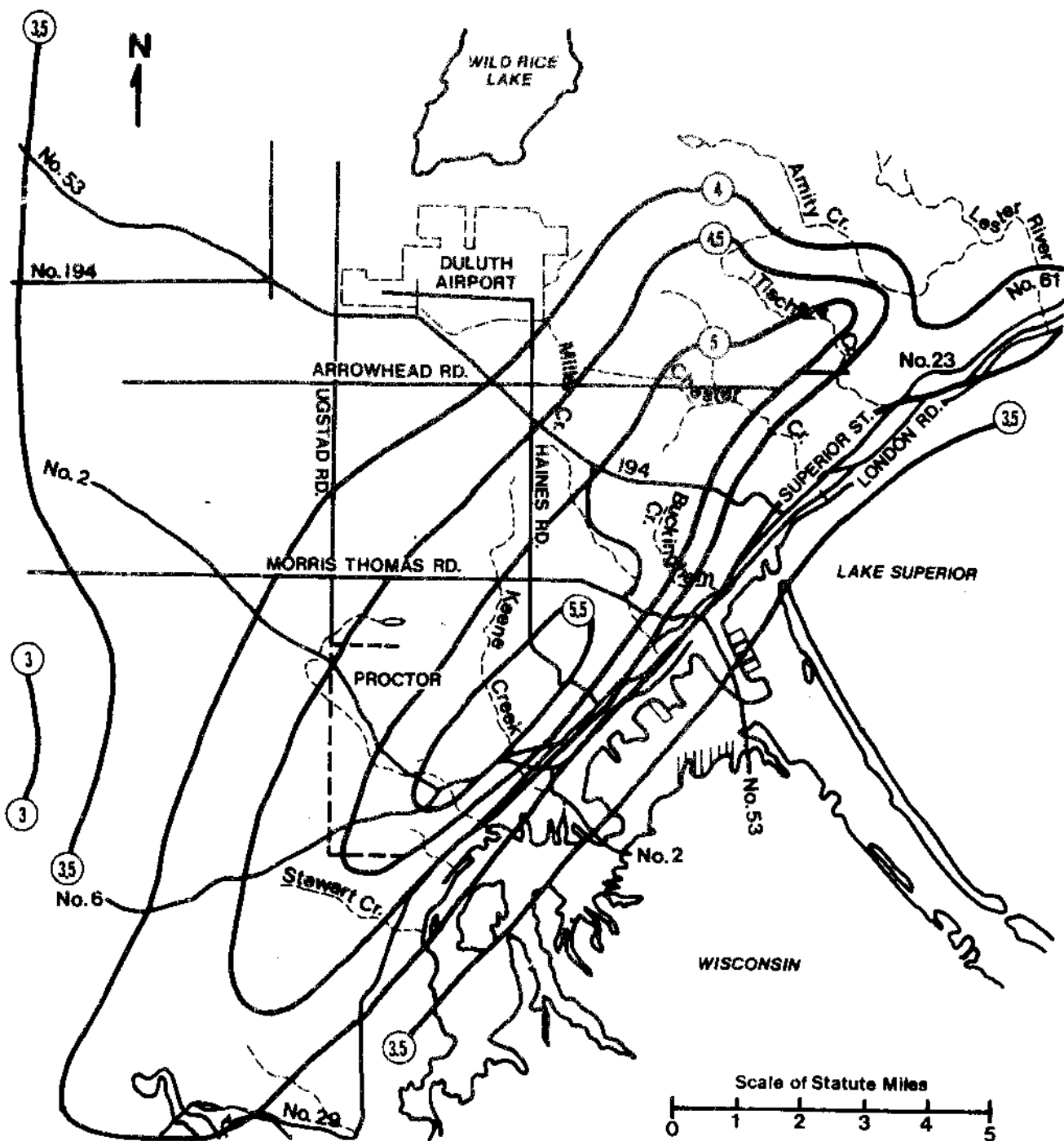
HEAVY RAINS IN DULUTH August 20, 1972



The isohyet map depicts the 2 to 4 inch heavy rainstorm passing through Duluth between 3:00 AM to 4:30 AM August 20, 1972. The storm caused the most damage in the history of Duluth (an estimated \$12,000,000). The severity of washouts of streets can be attributed to Duluth topography, an abrupt rise of the North Shore 800 feet within less than one mile. An additional factor contributing to the severity of this rainstorm is the 6.04 inches of rainfall falling the previous two weeks of which 3.82 inches fell on the 15th and 16th. This also caused a flash flood of minor portions. The prior rains saturated and weakened many streets and alleys and left many sewers partially clogged. All of this added to the destructiveness of the flash flood of the 20th. For additional information see the August 1972 Storm Data and the August 1972 National Climatological Data.

DULUTH FLASH FLOOD

September 20, 1972



Flash floods in Duluth and along the North Shore on the 20th caused two deaths and about \$1,000,000 damage. This is the third Duluth and the second North Shore flash flood this summer. See August and September, 1972 Storm Data for Minnesota.

The isohyet map depicts a 4 to 5.5 inch heavy rainstorm in the Duluth Area between 4:00 AM to about 2:00 PM on September 20, 1972. The map indicates that the 5-inch isohyet is about 2 miles wide, paralleling and inland along the crest of the hill or ridge. Information from widely scattered Civil Defense reports, it is believed the above pattern exists along the entire North Shore Area.