

QUANTIFICATION OF HISTORIC FLOOD DAMAGE IN THE MAPLE AND WILD
RICE WATERSHEDS OF THE RED RIVER OF THE NORTH BASIN

A Thesis
Submitted to the Graduate Faculty
of the
North Dakota State University
of Agriculture and Applied Science

By

Michael Edward Kjelland

In Partial Fulfillment of the Requirements
for the Degree of
MASTER OF SCIENCE

Major Program:
Natural Resources Management

Major Department:
Agribusiness and Applied Economics

March 2001

Fargo, North Dakota

ABSTRACT

Kjelland, Michael Edward, M.S., Program of Natural Resources Management, Department of Agribusiness and Applied Economics, College of Agriculture, North Dakota State University, March 2001. Quantification of Historic Flood Damage in the Maple and Wild Rice Watersheds of the Red River of the North Basin. Major Professor: Dr. Steven D. Shultz.

Between 1989 and 1998, flood damage was an estimated \$29.4 million in the Maple Watershed (MW), North Dakota, and \$102 million in the Wild Rice Watershed (WRW), Minnesota. Nonagricultural damage records were reviewed and attributed to a watershed or extrapolated to a watershed based on a county's percentage area or population within the watershed. Such adjustments reduced nonagricultural damage estimates by 80 percent (MW) and 27 percent (WRW). Agricultural damage, 55 percent (MW) and 31 percent (WRW) of total damage, was estimated by extrapolating previous estimates based on relationships between peak flood stages and cropland flooding. Without extrapolation, agricultural damage was underestimated by 77 percent (MW) and ranged from 69 percent underestimation to 72 percent overestimation (WRW). Without extrapolation and adjustments, total flood damage was underestimated by 59 percent (MW) and between 4 and 32 percent (WRW), indicating the need for improved flood damage data collection, organization, and reporting methods.