

FISCAL NOTE

DEC 31 1998

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Bill/Resolution No.: HB 1040 Amendment to:

Requested by Legislative Council Date of Request: December 23, 1998

1. Please estimate the fiscal impact (in dollar amounts) of the above measure for state general or special funds, counties, cities, and school districts.

Narrative: This bill proposes a statewide hail suppression program, at a cost of \$3.1M from the general fund in the 1999-2001 biennium. Of this, \$0.4M is to be expended during the first year for project design, planning, and environmental assessments. The annual cost of hail suppression operations in the second year of the biennium is \$2.7M. The program benefits are projected to total \$267M annually in increased business activity, which will generate an estimated additional \$5.1M in general fund revenue annually, according to an economic study of the project for the period of 1988-1997. This study used the 45% reduction in crop-hail damage reported in the Journal of Applied Meteorology (1997), and estimated increased rainfall on the order of 15%, as reported in NDSU Agricultural Economics Report No. 172 (1983). Only wheat, barley, sunflowers, soybeans, oats, corn grain, dry edible beans, and flax were included; other crops, including a forage crops, would realize additional benefits. Likewise, no estimate is made of benefits resulting from reduced property damage. The economic study was authored by F.L. Leistriz and R. Sell, both of the NDSU Department of Agricultural Economics. A copy of the executive summary of the study is attached to this fiscal note, complete copies are available upon request.

2. State fiscal effect in dollar amounts:

Table with 7 columns: 1997-99 Biennium (General Fund, Special Funds), 1999-2001 Biennium (General Fund, Special Funds), 2001-03 Biennium (General Fund, Special Funds). Rows: Revenues, Expenditures.

3. What, if any, is the effect of this measure on the appropriation for your agency or department:

- a. For rest of 1997-99 biennium: none
b. For the 1999-2001 biennium: increase of \$3.1M (general fund) over Governor's (1999-2001) recommendation
c. For the 2001-03 biennium: increase of \$5.72M (general fund) over Governor's (1999-2001) recommendation, only inflationary adjustments required for following biennium

4. County, City, and School District fiscal effect in dollar amounts:

Table with 9 columns: 1997-99 Biennium (Counties, Cities, School Districts), 1999-2001 Biennium (Counties, Cities, School Districts), 2001-03 Biennium (Counties, Cities, School Districts). Includes text: There will be no cost to cities, counties, or school districts in following bienniums, but projected additional business activity resulting from decreased hail crop and property losses and increased production should generate additional local tax revenue. Quantification of the magnitude of the additional revenue have not been attempted.

If additional space is needed, attach a supplemental sheet.

Signed [Signature]

Typed Name Bruce A. Boe, Director

Department Atmospheric Resource Board

Date Prepared: 12 - 31 - 1998

Phone Number 8 - 2788

Economic Impact of Reducing Hail and Enhancing Rainfall in North Dakota  
December 1998

Randall S. Sell and F. Larry Leistritz

### HIGHLIGHTS

*North Dakota producers experience substantial losses to farm output and fixed assets because of hail. The North Dakota Cloud Modification Project (NDCMP) has actively practiced cloud modification in five or six counties in western North Dakota during the past 10 years. A recent study concluded that crop-hail damage in the cloud modification counties was reduced by 45 percent for the wheat, barley, oats, corn, sunflower, and flax. Another impact of the cloud modification project is enhanced rainfall. Enhanced rainfall does not always benefit all producers, depending on the subsequent impacts on yield, quality, and price. The economic impact to the state of enhanced rainfall is also estimated. The crops used in estimating the combined impacts of hail reduction and rainfall enhancement were wheat, barley, oats, sunflower, corn, flax, soybeans, and dry edible beans.*

*Estimates of crop-hail losses and crop losses prevented with cloud modification for all counties were based upon crop production and hail data from 1988 to 1997. These estimates required multiplying the county level gross values of production by its annual loss-cost ratio to get the expected hail loss and then multiplying the expected loss by the 45 percent reduction factor to estimate the crop output savable with cloud modification. Slightly different equations were necessary depending on whether the county had an on-going cloud modification project in place.*

*Changes in crop production due to increased rainfall were determined. The effects of increased wheat production on price received were considered. A change in crop production was estimated by changing yields per acre, not acres of crop harvested.*

*The direct impact of hail reduction was \$34 million and the direct impact of rainfall enhancement was \$52 million statewide, which resulted in a total direct impact of nearly \$87 million annually. This direct impact results in an increase in total business activity of \$267 million or an average \$14.52 per planted acre. Seventy-five percent of the total economic impact occurred in two sectors of the economy, 'households' and 'retail trade.' Pembina County is projected to experience a slight negative impact from the additional rainfall (-\$0.28 per planted acre), but this is more than offset by the projected benefits from hail suppression activities (+\$3.05 per planted acre). All other counties are expected to be positive in both categories. Total impacts were generally greater in the eastern one-half of North Dakota while the impacts as a percentage of gross receipts were greater in western North Dakota.*

*The estimated annual cost of operating the NDCMP statewide was \$3.2 million. Increased state tax revenue from sales and use tax, personal income tax, and corporate income tax as a result of the program was \$5.1 million annually. Thus, the increased state tax revenue would substantially exceed the cost of the program.*