Feb 4/88

Mike:

I'm sure you already have a copy of this or a more detailed report, but I thought I'd send you it just in case you hadn't gotten it for some reason.

It's interesting that some people felt they had received > 30 minutes warning or even > 60 minutes warning of the tornado!

Les

Resource Technologies
Alberta Research Council
Edmonton, Alberta

INTRODUCTION

Two weeks after the July 31, 1987 tornado hit Edmonton, the survey shown in Figures 1a and 1b was published in the Edmonton Journal and the Edmonton Sun, the two local daily newspapers. By October 1, just over 800 responses had been received. No major interpretation problems were encountered except, perhaps we should have requested specific locations for each of the tornado, wind, hail, rain and damage reports because many observers were in transit on that fateful day.

RESULTS

The storm warning time which the public believed they had is of major interest to public safety officials. Figure 2 indicates that nearly 50% indicated that they had no warning at all. Only 20% believed that they had more than 15 minutes warning even though the tornado was active for over one hour. Furthermore, many of the respondents experienced their severe weather during a second storm which occurred two hours after the major tornado and hail storm had passed.

Figure 3 indicates, in terms of maximum hail size, all locations where observations were made. A plotted zero means that no hail report was sent in, but it does not necessarily mean that no hail fell there: 1 stands for shot size, 2 for pea, 3 for grape, 4 for walnut, 5 for golfball, 6 for tennis ball, and 7 for even larger. The outlined area on the map indicates where tennis ball or larger was reported. It encloses 125 square kilometers or approximately 20% of the area within the city boundary. Hail

A PUBLIC SURVEY ON THE EDMONTON TORNADO

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Department of Geography
Division of Meteorology
University of Alberta
Edmonton, Alberta

and

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Resource Technologies
Alberta Research Council
Edmonton, Alberta

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samples were collected from 60 locations. To date, no record sized hailstones have been recovered, but the 204 and 212 gram stones approach the 249 gram Alberta record.

Figure 4 maps locations from which funnel clouds were sighted. The plotted digits 1 through 5 imply increasing severity because they respectively represent the funnel shapes of rope, cone, columnar, smoke-like, and multiple. Only the highest digit reported in a particular survey has been plotted. Detailed study of the reports from the northwest quadrant indicate that two other funnel clouds approached the city but they did not touch down.

Although the data plotted in Figure 4 has not been thoroughly analyzed at this time, the following analysis of code 5, multiple sightings, can be discussed. The sketch corresponding to 'multiple' as drawn in the survey (Figure 1b) suggests that the respondent report sightings of complex funnel cloud structure and what meteorologists have called suction vortices. These details are indicative of violent tornados, F3 or greater on the Fujita scale. The two areas sketched in Figure 4 outline locations where reports of multiple structure predominate. The center of each area approximates locations where the tornado was particularly violent. Very few 5's are reported outside the circled area. This suggests that the fine structure of the tornado was only visible for two or three kilometers. However, the tornado was also violent further north where it exited the river valley but no 5's were reported there.

CONCLUSIONS

The survey responses contain a wealth of information. Many of the forms are covered with notes and all are legible. Further analysis will give insight into the awareness, response and observing skills of Edmontonians. The completed surveys will also form an important historical record because they will be available in the public library.

Analysis to date, reported above, indicates that the public feels that they had little real warning, that approximately 20% of the city had to face tennis ball size hailstones, and that many citizens took note of the detailed structure of the funnel clouds. Over 100 photographs and several video tapes were also collected as a result of the survey.

Finally, the survey has provided a convenient opportunity to pass on one's experiences and opinions to scientists, safety officials, and future generations.

FIGURE 1a

A Public Request to share your Storm Experiences

Meteorologists at the University of Alberta would like all Edmonton-area residents to share their experiences of the July 31 tornado by mailing this survey.

We would like to hear from people in Calmar, Beaumont and other badly hit areas. Within the City, we would like responses from all sectors, so that the extent of hail and rain damage can be accurately determined.

THE COMPLETED SURVEYS WILL BE PUT TO THE FOLLOWING USES:

1 To assess public opinion on the efficiency of our storm warning system. Your responses will be tabulated immediately so that a study can be conducted into possible improvements in this system. For this reason, it is important that we hear from you within a week.

2 Meteorologists at the University of Alberta, the Alberta Weather Centre, and the Alberta Research Council would like to use your comments to better assess the severity of the storm. If you have hailstone samples, we hope that you can save them in sealed plastic bags in a cold freezer. Within a month or two a graduate student doing research may contact you in the hope that you will make your hailstones, no matter what size, available for study.

3 Within six months we will photocopy all responses to the survey, organize them by name and area, and file them with the Edmonton Public Library for use by present and future generations. Please remember that it is critically important to study past storm occurrences in great detail if we are to learn from our experience and attempt to minimize damage in the future.

If you live out of town, please feel free to give land locations in quarter section, township and range. Also feel free to approximate times when events occurred. If you cannot recall, just put a question mark in the space.

We deeply sympathize with those who lost loved ones and their homes in the storm. However, we hope that they, too, will share their experiences through this survey.

Please mail your completed forms to:

R. CHARLETON
METEOROLOGY DIVISION
GEOGRAPHY DEPARTMENT
UNIVERSITY OF ALBERTA
EDMONTON, ALBERTA
T6G 2H4

N.A. - Not Applicable
Approximate
I don't know

Todays Date _____

Your Name _____

Your Home Address _____

_____

_____

Your Type of Work _____

_____

Your Phone Numbers _____ _____

Where Did You Encounter the Severe Weather?

_____

_____

Time of Encounter (Use ~ if approximate)

Friday, July 31, 1987, _____ p.m. to _____ p.m.

How Much Warning? _____ minutes

How were the Times Above Determined? (Check)

☐ Stopped Clock ☐ Memory ☐ Other _____

Type of Encounter (Check)

☐ Tornado ☐ Hail ☐ Violent Wind ☐ Violent Rain

☐ Other _____

What First Made You Aware of the Danger? (Check)

☐ Weather Forecast	☐ Unusual Cloud	☐ Rainfall
☐ Weather Radio	☐ Funnel Cloud	☐ Talking
☐ Radio or TV Report	☐ Hail Noise	☐ Screaming
☐ Electricity Failure	☐ Wind Noise	☐ Other

Please Explain: _____

_____

What Response Did You Take to the Warnings?

Please Explain: _____

_____

_____

TORNADO REPORT

Was Funnel Seen? ☐ Yes ☐ No (Check)

Did it Touch Ground? ☐ Yes ☐ No (Check)

Time Began _____ Lasted _____ min.

Closest Distance _____

Direction From You _____

Funnel Type (Check)



☐ Multiple ☐ Smoke-Like ☐ Columnar ☐ Cone ☐ Rope

☐ Unknown ☐ Other

If Multiple, How Many? _____

From Which Direction Did it Move? _____

Unusual Noise? ☐ Yes ☐ No (Check)

Unusual Sky Colour? ☐ Yes ☐ No (Check)

If Yes, Describe: _____

_____

Video Movies? _____ Photos? _____

WIND REPORT

Damaging? ☐ Yes ☐ No (Check)

Time Began: _____ Lasted: _____ min.

Describe: _____

_____

How Damaging? (Check) ☐ Twigs Off Trees ☐ Branches Off

☐ Shingle Damage ☐ Trees Down ☐ Windows Broken

☐ Other: _____

_____

HAIL REPORT

FIGURE 1b

Largest Size (Check) ☐ Shot ☐ Pea ☐ Grape ☐ Walnut

☐ Golfball ☐ Tennis ☐ Larger _____

Most Common Size: _____

Spacing on Ground: _____

Time Began: _____ Lasted: _____ min.

Describe Largest Stone and Measure It, Please: _____

_____

Frozen Samples: _____ Photos? _____

RAIN REPORT

How Much? (Check) ☐ Light ☐ Heavy ☐ Flooded Eaves

☐ Flooded Sewers ☐ Flooded Road ☐ Other _____

_____

Time Began: _____ Lasted: _____ min.

Describe: _____

_____

DAMAGE REPORT

Number of Human Fatalities ___ Number of Human Injuries ___

Number of Animal Fatalities ___ Number of Animal Injuries ___

Describe Property Damage (Objects Moved, Their Weight, Anchored?) _____

_____

Are Photos Available? ☐ Yes ☐ No (Check)

Who Took The Photos and Where Do They Live: _____

_____

_____

Who Else May Have Information? Name, Address, Phone

_____

_____

_____

Further Comments: _____

_____

If you have any further questions, please feel free to call us at 432-5672, 432-5405, or 432-5406.

MAIL YOUR REPORT TO: R. CHARLTON, METEOROLOGY DIV., GEOGRAPHY DEPT., UNIVERSITY OF ALBERTA, EDMONTON T6G 2H4

THANK YOU!

FIGURE 2

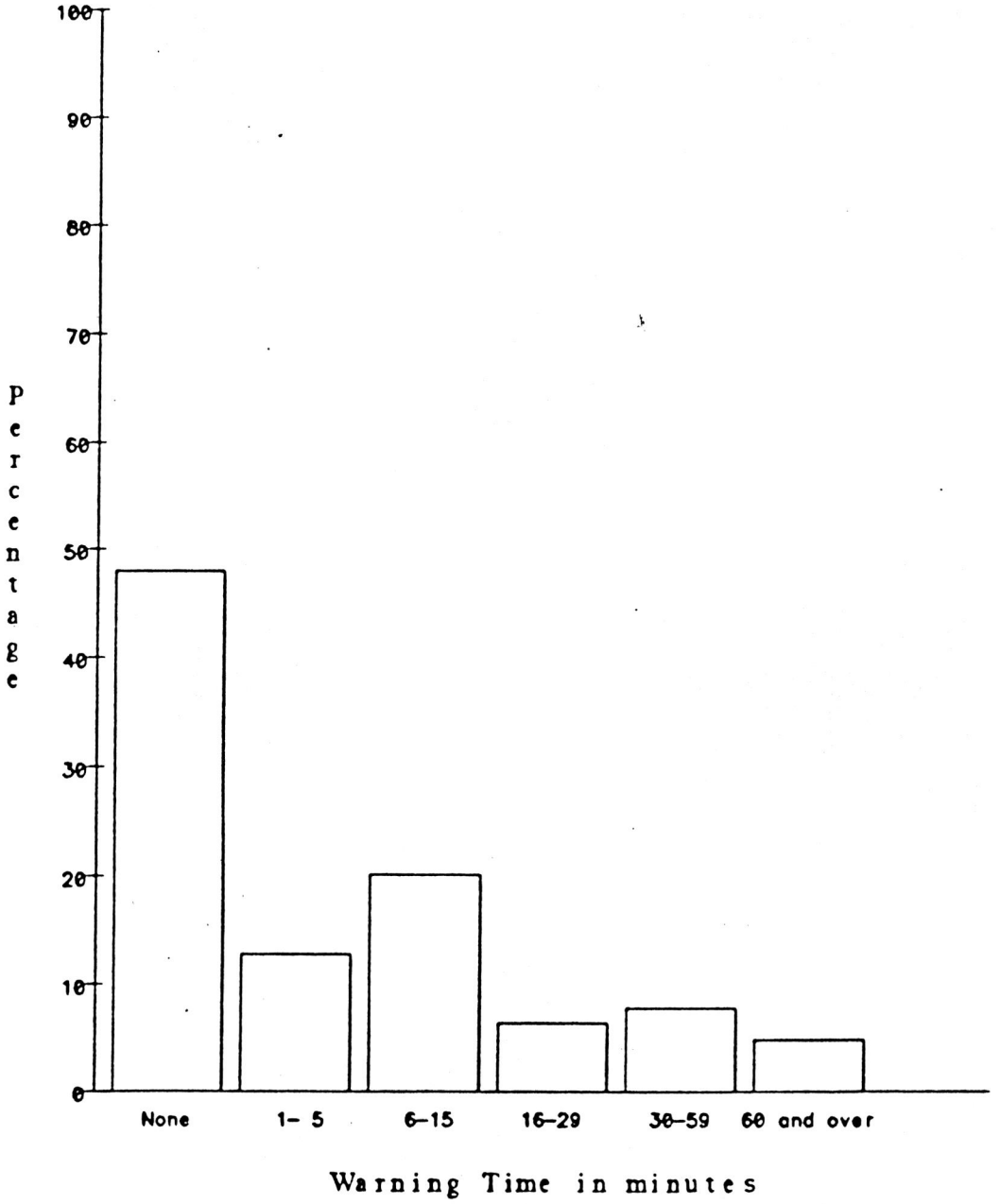
100
90
80
70
60
50
40
30
20
10
0
Percentage
None
1- 5
6-15
16-29
30-59
60 and over
Warning Time in minutes

FIGURE 3

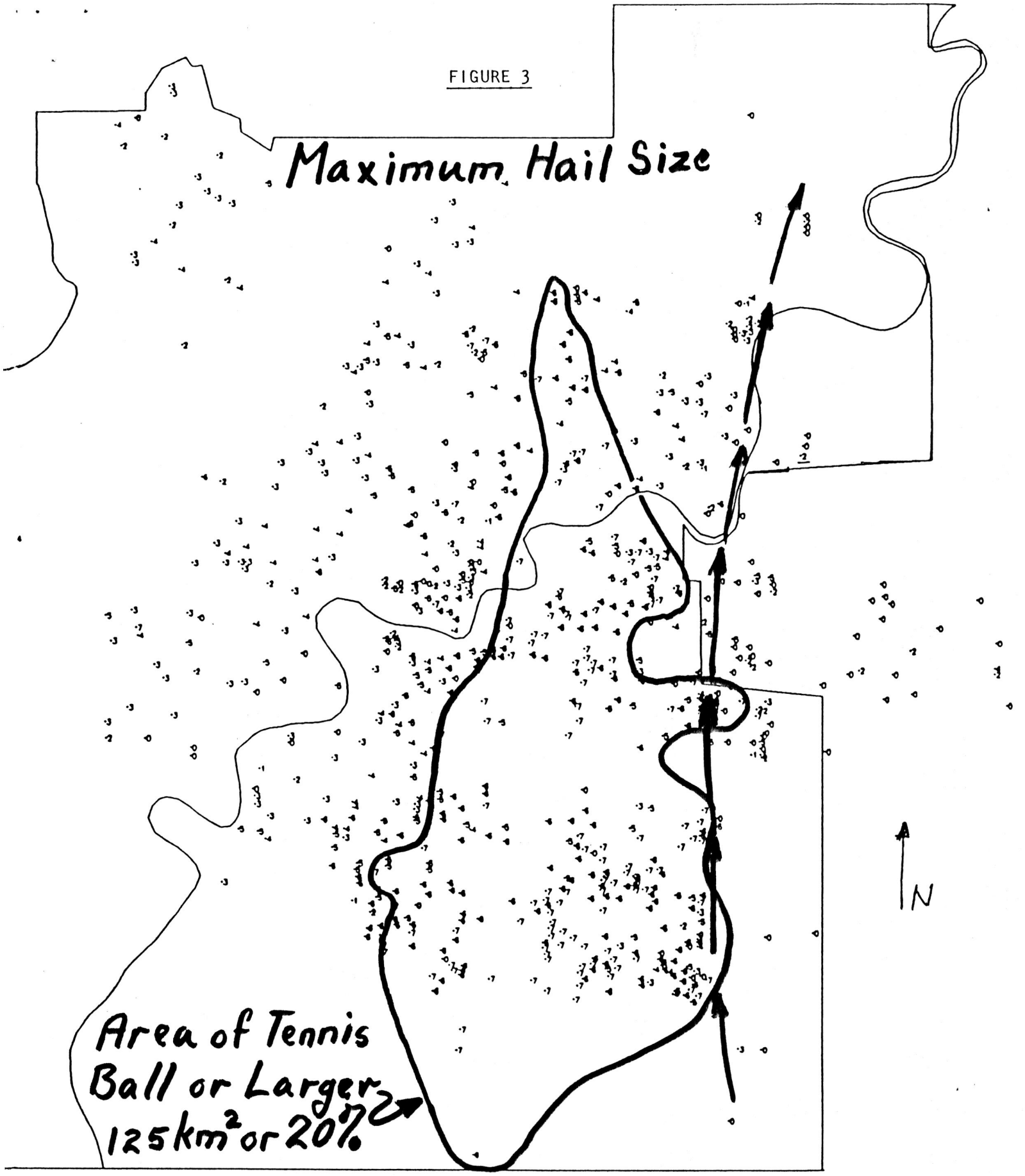
Maximum Hail Size
Area of Tennis Ball or Larger 125 km² or 20%
N

FIGURE 4

