

UNITED STATES DEPARTMENT OF AGRICULTURE  
SOIL CONSERVATION SERVICE  
REGIONAL TECHNICAL SERVICE CENTER  
UPPER DARBY, PENNSYLVANIA 19082

October 9, 1967

TSC TECHNICAL NOTE - WATERSHEDS - UD 19

To: State Conservationists, Northeast States  
From: Head, Engineering and Watershed Planning Unit  
Re: Economics - Basic Data for Evaluating Floodwater Damages to  
Urban Properties

This technical note and its attachments are issued in response to the request made by the States at the last Watershed Planning Meetings held October 25-26 and December 19-20, 1966, for data related to urban flood damages. The following items are attached for use by the Economist:

1. A folder of generalized urban damage data for use in preparing preliminary investigation reports and watershed work plans. This supplements the urban damage data issued at the Northeast Watershed Planning Party Economists Workshop held at Ocean City, Maryland, in July 17-21, 1961, and the Stanford Research Institute data recently issued with TSC Advisory WS-7 (UD) dated August 29, 1967.

The use of generalized data requires a determination that the data are applicable, and therefore, does not eliminate the need for personal interviews of flood-plain occupiers. Interviews are needed for the following purposes:

- a. To obtain a feeling for and to appraise the flood problem.
- b. To record high water marks.
- c. To establish the applicability of the generalized damage data by sampling a sufficient number of properties in the flood plain. If the sampled data is significantly different than the generalized data, either develop adjustment factors for the generalized data, or establish new damage data applicable to the properties found in the flood plain.

In many watershed projects, commercial properties are not found in sufficient numbers to warrant generalization. However, the attached data may then serve as a guide regarding relative increases in damages related to increased depth of flooding.

*See TSC Advisory - Watersheds - UD 19, 2-10-69*

2. Attachment No. 1 is a sample worksheet for recording field inventories of properties in the flood plain. The items and symbols given correspond to the classification parameters of the generalized damage data.

Any economic cost or losses which reasonably may be expected to be avoided, non-recurrable, made up, or offset should not be included in the estimate of flood damages.

3. Attachments Nos. 2 and 3 are suggested "damage schedules" for urban properties which will facilitate a uniform inventory of flood damages from field interviews. State summaries of the interview data, by types of properties from each State, will be made at the Unit and provided to all States. The summarized data may serve as a guide and basis for adjusting the generalized urban damage data to specific Northeast watershed situations, and for up-dating future revisions.

Indirect damages are usually computed as being a percent of direct damages. However, they may be obtained narratively or monetarily to establish percentage relationship with direct damages.

The above worksheet and schedules and conclusions developed therefrom should be filed with the watershed basic data.

*Donald E. Quinn*

ACTING



8/20/20

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DAMAGE SCHEDULE - RESIDENTIAL PROPERTY

(SAMPLE)

Date: \_\_\_\_\_

Interviewer: \_\_\_\_\_

I. RELEVANT DATA

River \_\_\_\_\_ No. \_\_\_\_\_

Date of Flood \_\_\_\_\_

City \_\_\_\_\_ No. \_\_\_\_\_

Address \_\_\_\_\_

Name \_\_\_\_\_

No. Separate Living Units  
in Building \_\_\_\_\_

Maximum Depth Floodwater:

Outside Bldg.: Depth: \_\_\_\_\_ Feet

Inside Bldg. on Floor: Yes \_\_\_ No \_\_\_ Depth: \_\_\_\_\_ Feet

Basement: Yes \_\_\_ No \_\_\_ Depth: \_\_\_\_\_ Feet

Warning Time: \_\_\_\_\_ Hours Duration of Flooding \_\_\_\_\_ Hours

Question: How much time did you work in an attempt to reduce water damage  
to the property after you heard about the rising water?

Man-Hours

II. VALUE OF PROPERTY SURVEYED

Market Value of Bldg. or Living Unit in Bldg. \_\_\_\_\_

Market Value of Contents of Bldg. or Living Unit \_\_\_\_\_

Market Value of Contents of Basements \_\_\_\_\_

III. ESTIMATED FLOODWATER DAMAGE LOSSES - Repair or replacement costs incurred, including costs to remove debris and sediment. Do not include costs or losses which reasonably may be expected to be avoided, non-recurrable, made up, or offset.

RECURRABLE DAMAGES ESTIMATES

Key				
-2	-1	Flood	+1	+2

Direct Damages:

Structure:

First Floor - Foundation, Walls,  
floors, wiring, etc.

\$ \_\_\_\_\_ \$ \_\_\_\_\_ \$ \_\_\_\_\_ \$ \_\_\_\_\_ \$ \_\_\_\_\_

Basement - Walls, floors, etc.

\_\_\_\_\_

Contents - Furniture, equipment ap-  
pliances, cars, personal  
belongings

First Floor

Basements

\_\_\_\_\_

Lot Improvements - Lawns, trees

\_\_\_\_\_

TOTAL

\_\_\_\_\_

Indirect Damages:

Emergency measures for relief,  
evacuation, etc.

\$ \_\_\_\_\_

Loss of income

\_\_\_\_\_

TOTAL

\_\_\_\_\_

IV. REMARKS:

DAMAGE SCHEDULE - COMMERCIAL AND INDUSTRIAL PROPERTY

(SAMPLE)

Date \_\_\_\_\_

Interviewer \_\_\_\_\_

Type of Business \_\_\_\_\_

I. RELEVANT DATA

River \_\_\_\_\_ No. \_\_\_\_\_ Date of flood \_\_\_\_\_

City \_\_\_\_\_ No. \_\_\_\_\_ Time of day \_\_\_\_\_  
when flooding began \_\_\_\_\_Name of establishment  
(doing business as) \_\_\_\_\_ Street Address \_\_\_\_\_Owner of business  
(if a tenant) \_\_\_\_\_ Parcel No. \_\_\_\_\_Owner of land and  
structure(s) \_\_\_\_\_ Area of parcel \_\_\_\_\_ sq ft/acres  
Floor space \_\_\_\_\_ sq ft/acresMaximum depth of floodwater (feet)

Outside building \_\_\_\_\_ Inside bldg. over 1st floor \_\_\_\_\_

At front \_\_\_\_\_ Over yard or lot \_\_\_\_\_

At rear \_\_\_\_\_

In basement \_\_\_\_\_

Warning time: \_\_\_\_\_ Hours Duration of flood \_\_\_\_\_ hours

Question: How much time did you work in an attempt to reduce water damage to  
the property after you heard about the rising water? \_\_\_\_\_ Man-hoursII. VALUE OF PROPERTY SURVEYED <sup>1/</sup>

Market value of structure \$ \_\_\_\_\_

Market value of fixtures owned by landlord \$ \_\_\_\_\_

Market value of equipment \$ \_\_\_\_\_

Market value of merchandise stocks \$ \_\_\_\_\_

Total market value of fixtures, equipment, and stocks \$ \_\_\_\_\_

1/ Market values may be obtained directly from owners, appraisers, etc., or estimated on basis of assessment for property tax purposes. Parcel number, name of owner of land and building, and name of owner of business (if a tenant) will assist in obtaining this information from the city or county assessor.

III. ESTIMATED FLOODWATER DAMAGES - Repair or replacement costs incurred, including costs to remove debris and sediment. Do not include costs or losses which reasonably may be expected to be avoided, non-recurrable, made up, or offset.

RECURRABLE DAMAGE ESTIMATES

	-2	-1	Key Flood	+1	+2
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Direct Damages:

Structure

First floor - Foundation, walls, wiring, floors, etc. \$ \_\_\_\_\_ \$ \_\_\_\_\_ \$ \_\_\_\_\_ \$ \_\_\_\_\_ \$ \_\_\_\_\_

Basement - Walls, floors, wiring, etc. \_\_\_\_\_

Contents - Furniture, furnishings, fixtures, equipment, merchandise stocks

First floor \_\_\_\_\_

Basement \_\_\_\_\_

Lot improvements - Lawns, trees, parking, fences, etc. \_\_\_\_\_

TOTAL \$ \_\_\_\_\_ \$ \_\_\_\_\_ \$ \_\_\_\_\_ \$ \_\_\_\_\_ \$ \_\_\_\_\_

Indirect Damages:

Loss of business net income \_\_\_\_\_

Loss of employees' wages not counted elsewhere \_\_\_\_\_

Other indirect loss, including costs of evacuation and re-occupation, flood prevention work, flood relief, etc. \_\_\_\_\_

TOTAL \$ \_\_\_\_\_ \$ \_\_\_\_\_ \$ \_\_\_\_\_ \$ \_\_\_\_\_ \$ \_\_\_\_\_

IV. REMARKS

January 21, 1974

DEPTH PERCENT DAMAGE  
STRUCTURES

(Flood Insurance Admin.)

Depth in Feet	Relative Weights in Curve Fitting	One Story- No Basement (01)	Two or More Stories-No Basement (03)	One Story- With Basement (13)	Two or More Stories-No Basement (18)	Split Level No Basement (05)	Split Level With Basement (23)	Mobile Homes (10)
		<u>SEL.</u>	<u>SEL.</u>	<u>SEL.</u>	<u>SEL.</u>	<u>SEL.</u>	<u>SEL.</u>	<u>SEL.</u>
				0 %	0 %		0 %	
-3	1							
-2	2			4	3		3	
-1	15	0 %	0 %	8	5	0 %	5	0 %
0	10	7	5	11	7	3	6	8
1	5	10	9	18	11	9	16	45
2	2	14	13	20	17	13	19	64
3	1	26	18	23	22	25	22	74
4	1	28	20	28	28	27	27	79
5	1	29	22	33	33	28	32	80
6	1	41	24	33	35	33	35	81
7	1	43	26	44	38	34	36	82
8	1	44	31	49	40	41	44	↓
9	1	45	36	51	44	43	48	
10	1	46	38	53	46	45	50	
11	1	47	40	55	48	46	52	
12	1	48	42	57	50	47	54	
13	1	49	44	59	52	48	56	
14	1	50	46	60	54	49	58	
15	1	↓	47	↓	56	50	59	
16	1	↓	48	↓	58	↓	60	
17	1		49		59		↓	
18	1		50		60			

See  
Lfr

Building Description						FLOOD DAMAGE FACTORS IN PERCENT OF PROPERTY VALUES																						
Class	Storage	Basement	Size	Ceilings	Furnishings	Stage-Damage @ Feet Above and Below First Floor																						
						-9	-8	-7	-6	-5	-4	-3	-2	-1	0	+1	+2	+3	+4	+5	+6	+7	+8	+9	+10			
A	1	Y	A	-	A	0	3.6	8.1	12.3	14.9	16.3	17.0	17.7	18.4	27.0	39.0	51.6	61.5	66.7	69.1	70.6	71.9	71.3	80.5	83.1			
A	1	N	A	-	A					0	0.3	0.5	0.8	8.8	20.4	36.5	49.6	56.3	58.9	60.5	61.2	60.4	71.4	75.1				
A	1 1/2	Y	A	-	A	0	2.3	5.4	8.2	9.6	10.2	10.8	11.4	11.9	16.9	24.2	31.2	27.0	30.2	41.7	48.2	43.9	44.7	49.8	53.1			
A	1 1/2	N	A	-	A					0	0.2	0.4	0.6	5.0	11.9	21.7	30.1	34.1	36.0	37.4	38.4	38.0	45.2	49.9				
A	2	Y	A	-	A	0	2.3	5.3	8.2	10.0	10.9	11.5	12.0	12.4	16.7	22.0	25.5	28.6	30.5	32.0	33.0	33.7	33.5	39.4	42.1			
A	2	N	A	-	A					0	0.2	0.4	0.6	4.7	10.1	16.2	21.6	24.7	26.7	27.7	28.6	28.9	28.6	39.2	42.1			
B	1	Y	A	-	A	0	2.3	4.1	6.1	7.5	8.8	9.6	10.5	18.0	30.7	43.0	53.8	58.8	61.1	62.9	64.5	64.0	71.6	76.1				
B	1	N	A	-	A					0	0.2	0.4	0.6	9.4	21.7	37.1	50.8	57.5	60.8	62.3	64.5	64.8	74.8	79.1				
B	1 1/2	Y	A	-	A	0	1.4	2.4	3.5	4.2	4.6	5.0	5.7	9.0	17.5	24.9	31.7	34.4	36.1	37.4	38.4	38.9	45.4	48.1				
B	1 1/2	N	A	-	A					0	0.2	0.3	0.5	5.2	11.9	20.9	29.5	33.3	35.0	36.6	38.0	38.3	45.6	48.1				
B	2	Y	A	-	A	0	1.5	2.7	4.1	5.0	5.8	6.3	6.5	9.8	15.2	19.2	22.5	24.4	25.7	26.7	27.4	27.5	32.8	35.1				
B	2	N	A	-	A					0	0.1	0.3	0.4	4.0	8.5	13.5	17.9	20.5	21.2	22.0	22.9	23.0	22.8	22.1				
B	2	Y	A	10'	A		0	1.6	2.8	4.2	5.3	5.9	6.4	2.7	12.0	14.1	17.7	20.8	22.5	23.6	24.5	25.0	25.0	25.0				
B	2	N	A	10'	A					0	0.1	0.3	0.4	4.0	7.6	10.5	15.3	18.6	21.3	22.3	23.1	23.2	23.8	23.1				
C	1	Y	A	-	A		0	2.5	4.2	5.8	8.8	10.0	10.8	17.9	25.4	35.0	42.5	50.0	52.1	53.8	55.0	55.4	63.8	66.1				
C	1	N	A	-	A					0	0.6	1.3	1.3	11.9	25.0	40.6	53.1	66.9	70.0	72.5	74.4	75.0	87.5	92.1				
C	1 1/2	Y	A	-	A		0	1.9	3.1	4.4	6.6	7.5	8.1	13.4	18.1	24.1	28.8	32.5	34.1	35.3	36.6	36.9	45.0	49.1				
C	1 1/2	N	A	-	A					0	0.4	0.8	0.8	7.9	15.4	24.2	31.3	37.2	40.0	41.7	43.2	43.8	54.6	60.1				
C	2	Y	A	-	A		0	1.3	2.1	2.9	4.4	5.0	5.4	8.5	11.0	14.0	16.0	17.9	19.0	19.6	20.7	20.4	25.8	28.1				
C	2	N	A	-	A					0	0.3	0.5	0.5	4.3	8.0	12.0	15.0	18.3	19.5	20.2	21.0	21.2	27.8	30.1				
C	2	Y	A	10'	A		0	1.3	2.1	2.9	4.4	5.0	5.4	9.0	11.7	14.8	17.1	19.0	20.0	20.8	21.5	21.7	21.7	21.1				
C	2	N	A	10'	A					0	0.3	0.5	0.5	4.8	8.8	13.0	15.3	19.5	20.8	21.8	22.5	22.8	22.8	22.1				
T			L		A						0	1.7	10.0	20.0	30.0	38.3	43.3	46.7	50.0	53.3	55.3	66.7						
T			A		A						0	1.0	6.0	14.0	22.0	28.0	34.0	38.0	40.0	42.0	46.0	50.0	50.0					
T			S		A						0	0.6	2.5	7.5	12.5	15.0	17.5	20.0	22.5	25.0	26.0	26.0						
D	1	N	A	-	A							0	4.0	9.5	17.5	26.0	34.0	38.5	40.5	43.5	43.5	43.5	43.5	51.1				
D	2	Y	A	-	A		0	1.3	2.5	7.5	8.8	10.0	12.5	17.5	20.0	22.5	23.8	24.1	25.0	26.0	27.5	28.8	30.1					

1/ For average size residences and average furnishings - See "Residential Flood Damage Appraisal System." See Table 2 for factors to adjust for other sizes and furnishings classes.