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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-recurrrable, 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.

Gold E. Quinn

ACTING



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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 appliances, 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 ^{1/}

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

		Key			
	-2	-1	Flood	+1	+2

Direct Damages:

Structure

First floor - Foundation, walls, wiring, floors, etc.	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____
Basement - Walls, floors, wiring, etc.	_____	_____	_____	_____	_____
<u>Contents</u> - Furniture, furnishings, fixtures, equipment, merchandise stocks					
First floor	_____	_____	_____	_____	_____
Basement	_____	_____	_____	_____	_____
<u>Lot improvements</u> - 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>SFL.</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	17	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
Lfg

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	73.3	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	57.9	60.5	61.9	63.4	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	37.9	39.9	41.7	43.2	43.9	44.7	49.8	53.1			
A	1 1/2	N	A	-	A						0	0.2	0.4	0.6	5.9	11.9	21.7	30.1	34.1	36.0	37.4	38.4	38.9	45.2	49.1			
A	2	Y	A	-	A	0	2.3	5.3	8.2	10.0	10.9	11.5	12.0	12.4	16.7	22.9	25.5	28.6	30.5	32.0	33.0	33.7	33.9	33.4	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	29.6	32.6	39.1			
B	1	Y	A	-	A	0	2.3	4.1	6.1	7.5	8.8	9.6	10.5	18.0	30.7	43.9	53.8	58.8	61.1	62.9	64.5	65.0	65.0	72.6	76.1			
B	1	N	A	-	A						0	0.2	0.4	0.6	9.4	21.7	37.1	50.8	57.5	60.2	62.3	64.2	64.9	71.8	79.1			
B	1 1/2	Y	A	-	A	0	1.4	2.4	3.5	4.2	4.6	5.0	5.7	9.9	17.5	24.9	31.7	34.4	36.1	37.4	38.1	38.2	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	35.2	36.6	37.0	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	25.5	31.4	33.7	35.7	37.4	37.9	42.8	45.1				
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	27.8	32.1				
B	2	Y	A	10'	A		0	1.6	2.8	4.2	5.3	5.9	6.4	9.7	12.0	14.1	17.7	20.8	22.5	23.6	24.5	25.2	25.0	25.1				
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	23.8	23.8				
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	70.9	72.5	74.4	75.9	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	40.9	41.7	43.2	43.9	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	20.2	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	21.9	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	20.9	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				
T			L		A								0	1.7	10.0	20.0	30.0	38.3	43.3	46.7	50.0	53.3	58.3	66.7	—			
T			A		A								0	1.0	6.0	14.0	22.0	28.0	34.0	38.0	40.0	46.0	50.0	50.0	—			
T			G		A								0	0.6	2.5	7.5	12.5	15.0	17.5	20.0	22.5	24.0	24.0	—	—			
D	1	N	A	-	A								0	4.0	9.5	17.5	26.0	34.0	38.5	40.5	40.5	40.5	40.5	45.5	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	25.2	27.5	28.8	30.1	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.