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.

Gerald E. Duncan

ACTING

Attachment No. 2

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:

Attachment No. 3

DAMAGE SCHEDULE - COMMERCIAL AND INDUSTRIAL PROPERTY

(SAMPLE)

Date _____

Interviewer _____

Type of Business _____

I. RELEVANT DATA

River _____ No. _____ Date of flood _____

Time of day

City _____ No. _____ 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/acres

Maximum depth of floodwater (feet)

Outside building

At front _____

At rear _____

In basement _____

Inside bldg. over 1st floor _____

Over yard or lot _____

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-hours

II. 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				
	-2	-1	Key Flood	+1	+2
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-With Basement (18)	Split Level No Basement (05)	Split Level With Basement (23)	Mobile Homes (10)
		SEL.	SEL.	SEL.	SEL.	SEL.	SEL.	SEL.
-3	1			0 %	0 %		0 %	
-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	16	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			

S TO RESIDENTIAL PROPERTY 1/

Building Description						FLOOD DAMAGE FACTORS IN PERCENT OF PROPERTY VALUES Stage-Damage @ Feet Above and Below First Floor																	
Class	Storage	Basement	Size	Ceilings	Furnishings	-9	-8	-7	-6	-5	-4	-3	-2	-1	1st Flr. 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.
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	61.9	63.4	71.4	75.
A	1½	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	37.0	39.2	41.7	43.2	44.5	44.7	49.8	53.
A	1½	N	A	-	A						0	0.2	0.4	0.6	5.0	11.9	21.7	32.1	34.1	36.0	37.4	38.4	38.9	45.2	49.
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	33.9	39.4	42.
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	28.4	28.9	35.6	39.
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	65.0	73.6	76.
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	74.8	79.
B	1½	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	38.4	38.9	45.4	48.
B	1½	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.
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	30.8	35.
B	2	N	A	-	A						0	0.1	0.3	0.4	4.0	8.5	13.5	17.9	20.5	21.9	23.0	23.8	23.9	29.8	32.
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	26.0	25.
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	23.
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	55.2	55.4	63.8	66.
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.
C	1½	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	45.9	49.
C	1½	N	A	-	A						0	0.4	0.8	0.8	7.9	15.4	24.2	31.3	37.3	40.0	41.7	43.3	43.8	54.6	60.
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	20.3	20.4	25.8	28.
C	2	N	A	-	A						0	0.3	0.5	0.5	4.3	8.0	12.0	15.0	18.3	19.5	20.3	21.0	21.2	27.8	30.
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	20.3	20.8	21.5	21.7	21.7	21.
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	21.9	22.5	22.8	22.8	22.
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	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	25.0	25.0	—
D	1	N	A	-	A									0	4.0	9.5	17.5	26.0	34.0	38.5	40.5	43.5	43.5	48.5	51.
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	26.3	27.5	28.8	30.

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.

NETSC, Broomall, Pa.
April 1978