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Volume II

Primer for Surveying Flood Damage for Residential Structures and Contents

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This is the second in a series of manuals designed to provide procedures and techniques to measure flood damage and to further implement the Principles and Guidelines of the U.S. Water Resources Council. This manual is a primer for conducting comprehensive flood damage and related surveys. It explains how basic principles of survey research can be applied to data collection for flood damage studies. Two prototype questionnaires (one face-to-face and one mail with a preliminary telephone supplement) are presented. Examples from previous applications of these questionnaires provide insight as to how they may be adapted and implemented for future flood damage studies.

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NATIONAL ECONOMIC DEVELOPMENT PROCEDURES MANUAL - URBAN FLOOD DAMAGE

Volume II

Primer for Surveying Flood Damage for Residential Structures and Contents

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PREFACE

This manual was prepared as part of the National Economic Development (NED) Procedures Manual Work Unit within the U.S. Army Corps of Engineers (COE) Planning Methodologies Research Program. Mr. William Hansen of the COE Water Resources Support Center (WRSC), Institute for Water Resources (IWR), manages this Work Unit under the general supervision of Mr. Michael Krouse, Chief of the Research Division, Mr. Kyle Schilling, Director of IWR, and Mr. Kenneth Murdock, Director of WRSC. Mr. Robert Daniel (CECW-PD) is the Technical Monitor for Headquarters, COE.

Dr. Allan Mills, School of Community and Public Affairs, Virginia Commonwealth University (VCU), co-authored this manual while serving under the terms of an Intergovernmental Personnel Act appointment with IWR.

Much of the information presented in this manual is based on the development and application of two different survey instruments used in on-going flood damage studies. Participating COE Districts and their study areas included: Baltimore District - the Wyoming Valley of Pennsylvania; Galveston District - Houston, Texas; and Los Angeles District - Santa Ana River Basin of California. Susan Durden, Formerly Acting Chief of Economics of the Corps Baltimore District; David Miller, Chief of Economics; and Clifford Kidd, Economist for that District, helped to facilitate the Wyoming Valley study. Also assisting with that study were James Brozena, P.E. - Luzerne County Engineer, and Jack Ruane - Flood Coordinator for the Luzerne

County Flood Protection Planning Board. The Houston study was facilitated with the help of Frank Incaprera, Former Chief of Economics for the Corps Galveston District. Also assisting from that District were Carol Hollaway, social scientist, and Roger Freeman, economist. Director, Dr. Wayne Jordan and Tobie Smith of the Texas Water Resources Institute at Texas A & M University also provided valuable assistance. Several individuals helped to facilitate the Santa Ana study in California. They include Ron Conner, Chief of Economics for the Corps Los Angeles District, and Patricia Luvender, economist with that District. Also of great assistance were Terrie Madeiras, Project Manager for the Orange County Lower Santa Ana River Project, and George Snider, Orange County Public Works Department.

Dr. Margot Garcia, Chair, and Dr. Gary Johnson of the Urban Studies and Planning Department at VCU, provided valuable assistance in designing and implementing the Wyoming Valley and Santa Ana River Basin data collection efforts. Dr. Diana Weigmann, Assistant Director for Research Administration at the Virginia Water Resources Research Center, Virginia Polytechnic Institute and State University, also provided critical administrative assistance in facilitating the VCU data collection for these projects.

TABLE OF CONTENTS

PREFACE iii

CHAPTER I INTRODUCTION 1

BACKGROUND 1

PURPOSE AND SCOPE 1

INTENDED AUDIENCE 2

ORGANIZATION OF THE MANUAL 2

CHAPTER II DETERMINING OBJECTIVES AND DATA NEEDS 7

ASSESSING EFFECTIVENESS OF FLOOD WARNING AND PREPAREDNESS SYSTEMS 9

DAMAGE ANALYSIS 11

DESCRIPTIVE PROFILE OF POPULATION 14

CONTENT AND STRUCTURE VALUES 15

UPDATE 17

OTHER OBJECTIVES 18

CHAPTER III SELECTING SURVEY APPROACH 19

FACE-TO-FACE 19

MAIL 20

TELEPHONE 22

COMBINATION 23

Table of Contents (Continued)

CHAPTER IV DESIGNING THE QUESTIONNAIRE 27

QUESTION RELEVANCE 29

QUESTION CONSTRUCTION 29

QUESTION VALIDITY 31

QUESTION RELIABILITY 33

QUESTIONNAIRE FORMAT 34

FACE-TO-FACE 35
MAIL 36

OTHER REVISIONS FOR A CHANGED METHOD OF ADMINISTRATION 38

PRETESTING THE QUESTIONNAIRE 40

CHAPTER V DESIGNING AND DRAWING THE SAMPLE 43

SAMPLING FRAME 43

SAMPLE SIZE 44

NUMERICAL QUESTIONS 45
CATEGORICAL QUESTIONS 46
SMALL POPULATIONS 47
SMALL SAMPLES FROM LARGER POPULATIONS 48

ALTERNATIVE SAMPLING METHODS 48

SIMPLE RANDOM SAMPLING 48
SYSTEMATIC SAMPLING 49
CLUSTER SAMPLING 51
MULTI-STAGE SAMPLING 52
STRATIFICATION 54

Table of Contents (Continued)

SPECIAL CONSIDERATIONS 58

SMALLER SAMPLES 58
SMALL SAMPLES OVER TIME 59

CHAPTER VI SURVEY IMPLEMENTATION 61

INTERVIEWER SELECTION 61

INTERPERSONAL SKILLS 61
SOURCES 62

INTERVIEWER TRAINING 63

FACE-TO-FACE 63
TELEPHONE 67

IMPLEMENTATION 68

FACE-TO-FACE 69
TELEPHONE 70
MAIL 72

CHAPTER VII RECOMMENDED IMPROVEMENTS 75

IMPLEMENTATION 75

FACE-TO-FACE 75
MAIL 77

QUESTIONNAIRE MODIFICATION 78

FACE-TO-FACE 78
MAIL 81

Table of Contents (Concluded)

CHAPTER VIII SUMMARY 83

DEFINING OBJECTIVES 83

SELECTING SURVEY METHOD 84

DESIGNING THE QUESTIONNAIRE 85

DRAWING A SAMPLE 86

SURVEY IMPLEMENTATION 87

FURTHER APPLICATIONS 88

LITERATURE CITED 89

APPENDIX A FACE-TO-FACE QUESTIONNAIRE AND INTRODUCTORY LETTER 91

APPENDIX B TELEPHONE SURVEY SCRIPT, MAIL QUESTIONNAIRE, AND COVER LETTERS 135

LIST OF TABLES

Table Number — Page Number

1. STEPS IN SURVEY RESEARCH METHOD 3

LIST OF FIGURES

Figure Number — Page Number

1. GEOGRAPHICAL STRATIFICATION OF FLOOD PLAIN - SANTA ANA STUDY AREA 56

2. GEOGRAPHICAL STRATIFICATION OF FLOOD PLAIN - WYOMING VALLEY STUDY AREA 57

CHAPTER I
INTRODUCTION

BACKGROUND

There is a continued need for improved techniques for identifying and measuring flood damage mitigation benefits. Research, being conducted under the U.S. Army Corps of Engineers Planning Methodologies Research Program, is addressing such issues as depth-damage relationships, content-to-structure value ratios, and the evaluation of flood warning programs. As part of this research effort, a series of residential surveys were conducted to provide needed data for analyses, specific results of which will be reported elsewhere.

From the series of residential surveys, prototype questionnaires have evolved for potential use in other flood control studies. These prototypes are very comprehensive and may address more survey objectives or may collect more detailed information than would normally be included in a planning study. Adaptation of all or part of these questionnaires to other flood control studies, however, has two benefits: 1) Corps districts and others using them will not have to completely "re-invent the wheel" of flood survey instrumentation; 2) resulting data from a series of similarly conducted flood control studies could contribute to a national data base, making further analyses possible.

PURPOSE AND SCOPE

This is a primer for conducting comprehensive flood damage surveys. It explains how the basic principles of survey research can be applied to data collection

for flood damage studies. Two prototype questionnaires (one face- to-face, and one mail with a preliminary telephone supplement) are presented. Examples from previous applications provide insight as to how these questionnaires may be adapted and implemented for future flood damage studies.

This manual is not meant to provide a comprehensive introduction to survey research methodology. Some familiarity with the survey method by the reader is assumed. A subsequent manual in this overall National Economic Development series will expand on many of the basic survey research issues not included here.

INTENDED AUDIENCE

This manual is primarily intended for use by Corps economists, other planners and administrators who must conduct flood damage surveys. It may also be useful for communities, states and other agencies who may participate as a non-Federal sponsor in a Corps study or who must design and implement their own flood damage survey. Distribution to non-Federal sponsors is encouraged whether or not they intend to take an active part in the flood damage analysis.

ORGANIZATION OF THE MANUAL

Following this introductory chapter, the manual is divided into chapters which generally correspond to the steps of the survey process as applied in flood damage studies. Some steps of the survey process must be completed in sequence, while others can be done simultaneously. The survey process, as illustrated in Table 1, consists of eleven steps, which differ somewhat depending upon the type of survey that is conducted: face-to-face, mail, or telephone. This manual, designed as a

primer for survey design and implementation, addresses the first seven of these steps, but not the last four, pertaining primarily to data processing and report writing.

TABLE 1

STEPS IN SURVEY RESEARCH METHOD

Face-to-Face Surveys	Telephone Surveys	Mail Surveys
1. Define Objectives	1. Define Objectives	1. Define Objectives
2. Select Survey Method	2. Select Survey Method	2. Select Survey Method
3. Design Questionnaire	3. Design Questionnaire	3. Design Questionnaire
4. Pretest a. Questionnaire b. Interview Process	4. Pretest a. Questionnaire b. Interview Process	4. Pretest a. Questionnaire b. Cover Letters c. Mail Procedures
5. Draw Sample	5. Draw Sample	5. Draw Sample
6. Select and Train Interviewers	6. Select and Train Interviewers	6. Select and Train Personnel
7. Conduct Interviews a. Visit Residences b. Followup Visits c. Manage Raw Data d. Supervise Interviewers	7. Conduct Interviews a. Initial Calls b. Followup Call-Backs c. Manage Raw Data d. Supervise Interviewers	7. Conduct Mail-Out(s) a. Initial Mailing b. Follow-up Mailings c. Manage Raw Data d. Supervise Personnel
8. Assess Non-Response	8. Assess Non-Response	8. Assess Non-Response
9. Code Data	9. Code Data	9. Code Data
10. Analyze Data	10. Analyze Data	10. Analyze Data
11. Write Final Report	11. Write Final Report	11. Write Final Report

It is very important that early in the process the objectives of the flood mitigation study be clearly defined (Step 1). Only after the study objectives are identified can it be determined whether or not a survey is the best method to obtain needed data, and what the more specific objectives of the survey should be. In Chapter II some typical objectives of flood mitigation studies are discussed as well as potential information needs.

Once the type of information needed and from whom it must be collected are identified, consideration can be given for selecting a survey approach (Step 2). There are basically three different ways to conduct a survey: face-to-face, telephone and mail. Some of the strengths and weaknesses of each method and some of the comparisons judged most relevant for determining which type of survey is best for different flood mitigation study situations are summarized in Chapter III.

The interrelated steps of designing (Step 3) and pretesting (Step 4) the questionnaire and survey procedures are addressed in Chapter IV. Discussed in this chapter are such issues as question relevance, validity, reliability and construction and questionnaire format; all of which should be given careful consideration when adapting the prototype questionnaires, or other previously used survey instruments, for use in new studies. Also discussed is the often overlooked step of pretesting, which is important even when only minor revisions are made to previously used questionnaires or survey procedures.

Sampling is an excellent means of reducing overall study data collection cost. Extreme care must be taken, however, to insure the sample selected is truly

representative of the population from which it is drawn. In Chapter V, the general steps for designing and drawing a sample (Step 5) for flood damage surveys are described. Also discussed are alternative sampling methods and some special considerations relevant to flood mitigation studies.

The steps of selecting and training interviewers/personnel (Step 6) and conducting the survey (Step 7) are addressed in Chapter VI. Considerations for selection of, and suggested training for, interviewers who will be contacting the public (with face-to-face and/or telephone surveys) are discussed. Survey implementation procedures for all three of the basic survey methods are illustrated through discussion of the previous applications of the prototype questionnaires.

Some recommendations for improving the prototype questionnaires, based on experience gleaned from previous applications are presented in Chapter VII. Chapter VIII provides a general summary. The manual concludes with two appendices. Appendix A contains the prototype face-to-face questionnaire, the letter announcing the survey, and the prior letter of introduction used in the Houston study. Appendix B contains the supplementary telephone survey script, the prototype mail questionnaire, cover letters, and post cards used in the Santa Ana River Basin and Wyoming Valley applications.

CHAPTER II
DETERMINING OBJECTIVES AND DATA NEEDS

It is very important that the overall objectives of the flood mitigation study be clearly defined. Only after the study objectives are identified can it be determined whether or not a survey is the best source to obtain any needed data, and what the more specific objectives of the survey effort should be. There may be just one study objective or several. It is usually cost effective to include more than one study objective in large scale flood damage survey efforts, because fixed costs of identifying the sample and contacting interviewees remain the same. If a survey is to be used, specific objectives of the survey are formulated based upon the specific kinds of data needs dictated by the study objectives.

The prototype questionnaires in Appendices A and B were developed and implemented to support both research and project-specific planning needs. As part of its Planning Methodologies Research Program, IWR is investigating several flood mitigation topics, including: 1) empirically deriving depth-damage functions and other damage (e.g., evacuation costs) relations and statistically testing factors (e.g., duration of flooding) that might influence these relationships; 2) empirically quantifying content values and deriving methods for predicting the influence of affluence and other factors over time; and 3) developing procedures for evaluating the effectiveness of flood warning systems.

As described later in this chapter, the questionnaire in Appendix A was designed to collect information to support all of the above research needs. Socio-

economic profiles of respondents were also collected for sampling purposes and to support data analysis. Much of the data collected was also intended to be used to support an on-going flood mitigation study in Houston, Texas, where the survey data were collected.

The objectives for the prototype questionnaire in Appendix B were more narrowly focused. It was developed and implemented, primarily, to respond to an Army Audit Agency review that was critical of contents-to-structure ratios used in flood mitigation studies for the Santa Ana Flood Control Project in Orange County, California, and the Wyoming Valley Levee Raising Project in Luzerne County, Pennsylvania. The primary survey objective, therefore, was to collect data needed to empirically verify existing content-to-structure ratios and to provide supporting socio-economic profiles for data analysis. As described in more detail in Chapter VI, the relevant portions of the questionnaire in Appendix A were excerpted and modified as necessary to address the more limited objectives for these planning studies. The data, however, were collected in a consistent manner so they could be compared with previously collected data from the Houston study for research purposes.

Following is a discussion of some of the more typical study objectives that might be included in flood damage survey efforts. Included is a brief discussion of information needs to support these objectives and references to particular questions or sections of the questionnaires in Appendices A and B that were used to collect this information. The objectives are discussed in the general order that questions supporting them were included in the questionnaire. The reasons for this ordering are

discussed in more detail in Chapter IV on questionnaire design. Some specific questions do support more than one study objective. For example, questions identifying content and structure values are also important in deriving depth-damage relationships.

ASSESSING EFFECTIVENESS OF FLOOD WARNING AND PREPAREDNESS SYSTEMS

One potential flood damage study objective is to assess the effectiveness of flood warning and preparedness systems. To address this objective, surveys can be used to collect detailed information on residents' awareness of watches and warnings issued before the flood. The survey can also document the type of actions taken by residents as a result of hearing these messages. Survey questions can be used to document any environmental cues (e.g. seeing the river level rise or continued heavy rain) to which individuals respond, the actions they take to prevent damages, and the amount of damages they are able to prevent in response to a warning message.

The first part of the Appendix A questionnaire, (Questions 1-30, pages 97-105) address the flood warning process. Question 1 is used to determine whether or not respondents were living in the residence at the time of the flood, and Question 2 determines which month the residence was flooded (if at all). The Houston area experienced floods in both May and June of 1989, and questions, throughout the survey, were to apply to the first of those floods that reached the respondent's home. Questions 3 through 5 determine how respondents perceive flood risk, whether they have experienced flooding, and if they evacuated in response to threat of flooding. Questions 6 through 9 determine whether respondents heard a message about

possible flooding prior to the flood, what the message was understood to say, and what day and time the message occurred. The time of the message was needed to determine how long, relative to the onset of the flood (determined by Question 11), it took to get the message out to the public and how long respondents had to react. Question 10 determines the form in which the message was received. Question 12 determines how respondents responded to the message and Question 13 rates the strength of the respondent's belief in the message.

It is sometimes necessary to issue more than one warning, and at different levels of severity, to get people to respond to messages. Question 14 is used to determine whether or not more than one message was received. If so, then Questions 15 through 20 are used to obtain similar information for the second message as was obtained for the first (with Questions 7 through 13). Questions 21 through 23 ask about any more messages received, and Question 24 asks for suggestions for ways to improve the current flood warning system.

If a warning message is received it cannot be assumed that everyone receiving it will take preventive action. Questions 25 through 29 determine whether or not residents evacuated their residence, the day and time of evacuation, the reason for evacuation, mode of evacuation, and time it took to get out of the area of danger. For those who received a warning message but did not evacuate, Question 30 determines their reasons for not evacuating.

Some additional questions needed to complete the evaluation of the effectiveness of flood warning systems were included in the second part of the

questionnaire in Appendix A, addressing costs and damages. Questions 31 through 33 (page 106) are used to determine the costs of evacuation. Question 45 (page 109) determines the amount of time that was available to spend on damage prevention. This information can be used to construct a "damage prevented lead-time" curve. Questions 46 through 48 ask about additional damages that might have been prevented if additional time were available. These questions were also included to provide data for construction of a hypothetical "damage prevention lead time" curve. In our application, however, respondents had difficulty in providing this hypothetical information, and the questions were subsequently dropped from the interview. Additional information to evaluate flood warning and preparedness systems is included in the content inventory form, described below in the section on content and structure values. Questions on whether preventive action was taken and whether an item was elevated or moved out of the structure are included.

DAMAGE ANALYSIS

One of the most important tools analysts have for estimating residential flood damage is depth-damage functions. Consequently, a frequent objective of Corps flood damage surveys is to collect data needed to derive these functions.

Depth-damage functions describe the relationship between the level of inundation to water in a structure and the amount of damage sustained. The level of sustained damage is generally measured as percent damage-to-structure and percent damage-to-contents. Percent damage-to-structure is defined by the structure damage as a percentage of total structure value, and percent damage-to-contents is defined by

content damage as a percentage of the total value of the contents. The structure is defined as the building itself and its components, as well as built-in appliances, shelves and carpeting. Contents includes all those items within the structure not permanently attached.

There are two types of depth-damage information which can be collected: 1) historic damage from actual floods recent enough that most flood victims will still be there and have records and recollections of their damages; and 2) in cases where there has not been recent flooding, an inventory of existing "damageable property" for estimating synthetic depth-damage relationships. Synthetic depth-damage relationships are derived by estimating the amount of damage that would likely occur for various levels of flooding, rather than by actual flood experience. Whether the depth-damage relations are based on actual damage or synthetic damage estimates, it is necessary to obtain estimates of structure and content value, described in more detail in a following section.

While depth-damage functions describe direct physical losses, it is also important to make a full accounting of the other costs of flooding that have occurred. For instance, costs of clean-up and temporary relocation are generally not included in standard depth-damage functions. These other costs of flooding may also be related to depth, duration of flooding, the amount of sediment in the water, or some other factor.

Part II of the Appendix A questionnaire (Questions 31-52, pages 106-110) was used to determine flood damage and costs incurred for different types of properties

and possessions. It provides much of the basic data for determining depth-damage and other damage relations. As noted above, Questions 31-33, and 45-48 are used primarily in the evaluation of the effectiveness of flood warning systems.

Questions 34 and 35 ask for the number of days and estimated wages lost as a result of the flood. Question 36 is used to determine the value of the residence before the flood occurred, and Question 37 obtains information on number of vehicles and vehicle damage. Question 38 asks whether or not the resident had National Flood Insurance coverage at the time of the flood, and Questions 39b. and 41b. ask how much in insurance payments they expected to receive. The flood insurance question was included to determine the impact of flooding on the individual households, that is to determine what portion of their losses would likely be covered by flood insurance.

More specifically for depth-damage functions, Questions 39-44 obtain information on type and amount of structure damage, total amount of content damage (more specific information on specific content damage is asked under the content inventory described below), amount of structure and content damage covered by insurance payments, and information on the depth and duration of flooding.

The end of Part II of the questionnaire (Questions 49-52) obtains information on time and costs of clean up and repair and damage or cost incurred from such other activities, as storage, vandalism or looting.

Additional depth-damage information was included in the inventory form, described below under content and structure values. Questions relating the elevation

of each room to the first floor level and the elevation of each item relative to the floor of that room were included to make synthetic damage estimates.

DESCRIPTIVE PROFILE OF POPULATION

A very basic, but important, objective of most flood damage studies is to describe the demographic and socio-economic characteristics of the floodplain population. Census data can be used to address this study objective in a very general way, but for the most accurate description a survey is usually required. To describe the floodplain population, questions such as sex, ethnicity, marital status, age, education, and income are either asked in the survey questionnaire or observed by a survey interviewer. The third part of the questionnaire in Appendix A (Questions 53-61, pages 111-112) were used to record these characteristics.

The demographic and socio-economic "background" questions included in a survey questionnaire are often important for data analysis in support of other study objectives or purposes. Resident characteristics such as education may make a difference in flood warning response, and can be included in analyses associated with flood watch/warning studies. Socio-demographic data can also be used to determine if content-to-structure ratios vary by some of these characteristics. If they do, ratios can be estimated or projected based on the underlying characteristics. The characteristic of home ownership, which is requested by Question 57 in Appendix A, may be important to consider when calculating depth/damage relationships.

Descriptive profiles can also be used for post-stratification weighting procedures to adjust for differences between sample characteristics and population characteristics

documented by the U.S. census or other sources. Examples from the Appendix A questionnaire of variables typically used for this purpose are race/ethnicity, marital status, age, education, and income.

CONTENT AND STRUCTURE VALUES

Determining structure and content values are a basic part of the floodplain inventory. Survey data can be important sources of both. In either case specific information from floodplain residents can be much more valuable than that from any secondary source.

For Corps flood damage analysis, depreciated replacement values are to be used in estimating structure value. Market value is only to be used if it can be demonstrated that it closely approximates depreciated replacement value (Engineering Regulation 1105-2-100, paragraph 6-167). Depreciated replacement values are believed to more closely measure the value of economic welfare subject to flood loss than market values.

Depreciated replacement values for structures can be determined by using the data and programs developed by firms such as Marshall and Swift Company of Los Angeles, California, or E.H. Boeckh and Company, of Milwaukee, Wisconsin. When this is done, a survey may still serve an important purpose. The survey questionnaire can document detailed information about each structure, which is then used as input for the value estimating procedure. Page 115[1] of Part IV of the Appendix A questionnaire and Questions 1-10 (pages 161-162) of the Appendix B questionnaire

[1] A cautionary note on the use of this form is the subjective nature of item "CO 5 Effective Age." Interviewer training is required to ensure consistent and reliable information is collected for this variable.

were used to obtain the information needed (e.g. building style, construction materials, and heating and cooling systems) to use the Marshall-Swift residential estimator program.

Another method to estimate structure values is to include valuation questions in a survey questionnaire; simply asking the respondents what they perceive their structure (home) is worth. For example, Question 36 in Appendix A asks for approximate market value of the home. The "market value" includes land value, which later must be deducted. But, as stated above, these market values should only be used if they can be shown to closely approximate the depreciated replacement value.

A contents inventory can provide information on what contents are present, and can also provide either direct estimates of their value or information such as age and condition which can later be used to estimate their value. Inventory forms are included in both prototype questionnaires. The inventory form can be completed by an interviewer (part V of the Appendix A questionnaire, pages 117-133), or by the respondent (pages 149-160 of the Appendix B questionnaire).

The inventory forms are used to identify specific content items located in the residential structure, not only at the time of the interview, but also during the time a previous flood occurred. Additional information such as physical location (e.g. room and/or elevation), age, and/or condition of content items can also be recorded. In our use of the Appendix A questionnaire, a range of suggested item replacement costs was also included on the inventory form. It was shown to respondents to help elicit an estimate of replacement costs if they otherwise found it difficult to provide such an

estimate. Replacement cost was defined as the approximate cost of an item if it was to be purchased new at the time of the interview.

The inventory form for the face-to-face survey has multiple purposes. The value data, the location of the room relative to the first floor, the location of the item relative to the floor, and the amount of damage can be useful in determining both synthetic depth-damage functions and depth-damage functions based on actual flood experience. Questions related to whether preventive action was taken and whether the item was elevated or evacuated are useful in determining the extent of flood warning response.

The content and structure value information, determined from flood surveys, can be used to determine content-to-structure value ratios. Content-to-structure value ratios measure the value of a building's contents as a percentage of the value of the structure. These ratios might be applied on a generalized basis to the entire project area or to other projects in the same district. Adjustments in content-to-structure value ratios can be made by the application of regression analysis, accounting for such factors as income, tenure, and marital status of the population as well as square footage and market value of the structure.

UPDATE

A survey objective may be to determine whether or not significant changes have occurred in data previously collected. In this case it may be useful to conduct a small scale survey asking a few select questions of a small sample. For example, Questions Q17 through Q20 in Appendix B provided baseline information on the

proportion of floodplain households with flood insurance for the Pennsylvania and California study areas surveyed. Future small scale survey results using these same questions would provide a crude test for changes in the information obtained. Results might be used to make a decision regarding whether or not households in the survey region should be encouraged to acquire flood insurance, or to assess the results of any such efforts made at a previous point in time. Results of the update survey may also be used to determine whether or not a more detailed survey is need.

OTHER OBJECTIVES

Surveys may be designed to collect appropriate information for one or more of the above study objectives at the same time. Additional study objectives may be determined by the flood damage analyst. A local government project sponsor or state government agency also may have additional objectives, which a Corps survey can help fulfill. Questions 17 through 20 in the Appendix B survey were included at the request of Luzerne County, Pennsylvania, officials to help with their flood mitigation strategies. It must be remembered, however, that adding additional study objectives to any one survey usually means adding additional survey questions and increasing questionnaire length. At some point a maximum tolerable length will be reached.

CHAPTER III
SELECTING SURVEY APPROACH

There are basically three alternative methods of survey design and administration: face-to-face surveys, telephone surveys, and mail surveys. The strengths and weaknesses of each method in terms of different performance characteristics have been compared in a comprehensive table by Dillman (1978: 74-75). Some of the comparisons judged most relevant for determining which type of survey is best for different flood damage study situations are summarized below.

FACE-TO-FACE

A face-to-face survey instrument is generally best for getting high response to long and complex flood damage interviews. In a face-to-face situation interviewers can verify that responses to survey questions are obtained from the appropriate respondent or spokesperson. They can also clarify survey questions for respondents and obtain complete answers. Interviewers usually record all answers given, saving the respondent this task as compared to a self-administered mail questionnaire. However, face-to-face surveys are generally more costly and require more personnel than telephone and mail survey alternatives. With face-to-face surveys, there is also the risk of the interviewer introducing bias or distorting the data collected, but this can be minimized with good interviewer training (see Chapter VI).

Critical considerations as to what type of survey is most appropriate for a particular application include the type of information to be collected, the length of the questionnaire and the size of the area from which information must be collected.

Face-to-face interviews are generally more appropriate than either mail or telephone surveys when the questionnaire is long (e.g. 15 pages or more) or very detailed. The questionnaire in Appendix A was designed to address several research objectives. As such it was quite lengthy, 36 pages, and often required obtaining considerable detail from the respondents. In addition, the Houston floodplain area was a relatively small geographic area that could be efficiently surveyed with a face-to-face approach. For these reasons, and to ensure a good response rate, the face-to-face approach was considered most desirable.

MAIL

Mail surveys may be appropriate for some flood damage studies. This is especially true when households must be sampled in a large geographical area for which face-to-face household interviews surveys would be very costly. Mail surveys are generally less successful for questions which are complex, long, or open-ended (requiring a written response rather than a choice from a list of answers).

With a mail survey, the absence of an interviewer does eliminate the chance for interviewer bias, however, it practically eliminates any possibility of assisting the respondents in understanding the questions asked. Therefore the questions must be as unambiguous as possible. Even if mail respondents are invited to telephone the analyst at no cost when they do not understand something in the questionnaire, they will seldom take the time to do so. However, many will telephone if they are angry or upset. Several potential respondents to the Appendix B mail questionnaire phoned to indicate they felt the level of detail being requested for the home content inventory

was excessively intrusive. In such cases, the callers benefitted by being able to vent their feelings. It was explained to them why this detail was needed for accurate value estimates, but they were told they did have the right to refuse to provide the information if they so desired.

Mail surveys are usually lower in cost than other methods, but can be very expensive when lengthy questionnaires must be mailed repeatedly with first class postage. Mail surveys also usually take the longest time to implement. This is because a "wave technique" is generally required to assure an adequate response. It involves several questionnaire "waves" or repeat mailings, which are sent to each household until a response is achieved. All of this can rarely be completed in less than two months. Response to mail surveys is typically not as high as with other survey methods, even with careful attention to proper procedure. The poorer the initial response, the greater the additional cost and effort needed for repeat mailings.

Techniques, such as using a booklet format for the questionnaire and hand signing each cover letter sent with the questionnaire, can help to increase response. However, response to long and detailed flood damage questionnaires is likely to be biased toward those who are more highly motivated to fill out the questionnaire or more likely to have the time to do so. Corrections for these biases can sometimes be made during analysis of the data, provided biases are identified during data collection. Data can be weighted relative to characteristics of the overall population if one or more population groups are under- or over-represented in the sample. Analysis

procedures such as multiple regression can also be used to generate results with appropriately weighted coefficients.

A mail questionnaire was used in the Santa Ana and Wyoming Valley studies because of the large geographic areas involved, particularly for Santa Ana, and the judgement that a sufficiently sophisticated and workable mail data collection instrument could be developed. The questionnaire was formatted to produce both an original and a carbonless copy of the content inventory. The carbonless copy was to be retained by respondents for their own personal records and was included in the design as an incentive to get respondents to take the time to complete and return the questionnaire. A preliminary telephone contact was also included to explain the study to all potential respondents, and to obtain verbal commitments for completing the mail survey.

TELEPHONE

Similar to face-to-face surveys, telephone surveys also require using trained interviewers who read survey questions to respondents and record the responses. Telephone surveys generally require the least number of days to complete, because interviewers do not have to physically travel to the residences being surveyed and it is not necessary to wait for questionnaires to be mailed back. Telephone surveys are also generally less costly than face-to-face surveys.

There are limits to the amount and complexity of information that it is possible to get from respondents over the telephone. The amount of time respondents are willing to spend answering questions by telephone is also limited. Lengthy questions and long lists of answer choices are difficult for some respondents to comprehend

over the telephone. Also, there may be a reluctance to answer questions considered very personal or confidential over the phone. Examples might be background questions such as family income, structure and contents values, and flood loss information. For these reasons telephone surveys are usually not the best method for conducting long and complex flood damage interviews.

A telephone survey may be appropriate for a flood damage survey objective for which the required survey questions do not have the above limitations. An example would be assessing the effectiveness of flood warning and preparedness systems. Questions 1 through 30 of the Appendix A questionnaire could be easily adapted for a telephone survey script to collect the data necessary to address this objective. Most of these questions should be relatively easy for respondents to answer and would not result in a lengthy interview. A letter mailed in advance of the telephone call may be helpful in alerting respondents to the reason for the interview and to any questions for which facts may need to be gathered from personal records.

COMBINATION

Combining telephone, mail and/or face-to-face components in a survey may be a better approach in some instances than using any one method by itself. Telephone surveys are recommended for short preliminary interviews to select (screen) appropriate respondents and get their commitment to respond to a later face-to-face or mail survey. They also can be used for followup interviews to determine reasons for refusals to participate in face-to-face interviews and for non-response to mail surveys.

As mentioned earlier, a preliminary telephone survey was combined with the mail survey procedure used to survey residents in the Santa Ana and Wyoming Valley studies. Both telephone and mail components of that survey are included in Appendix B and described in more detail in Chapter VI. A telephone contact was first used to explain the study to selected respondents and get their commitment to complete a mail questionnaire. The questionnaire was then sent with a persuasive cover letter and self-addressed, postage-paid return envelope. This was followed by a reminder post card to all respondents, and later, with a second letter and questionnaire sent to those who had not responded within three weeks. A final telephone call was made to a sample of those who did not return their questionnaire two or more months after the initial mailing. The telephone call documented reasons for refusals to respond and asked several demographic questions to check for non-response bias.

In some situations a mail survey may be conducted first, followed by a face-to-face or telephone survey. Instead of a full scale survey, the initial mail contact may be only a letter to alert potential respondents to a future telephone or face-to-face interview. A map or other illustration needed for the following interview may also be mailed with this kind of preliminary letter.

A face-to-face contact may also be used to precede a mail and/or telephone survey. Interviewers can make an initial face-to-face contact, leaving a self administered questionnaire to be mailed back or telephoned in when completed.

Survey procedures may also combine face-to-face, telephone, and mail methods all in the same survey. One example of this would be making the original

contact by telephone, mailing the questionnaire to those consenting to be interviewed, and picking it up in person from respondents at an agreed upon date rather than waiting for it to be returned. Personal contact at the time questionnaires are collected might increase the number and completeness of questionnaires returned. If necessary, a supplementary face-to-face interview could be conducted at the pickup time to fill in questionnaire omissions or obtain additional information.

Combining several methods may become just as costly as designing a complete face-to-face survey. If so, and all other considerations are equal, a face-to-face survey should generally be used. There may, however, be very good reasons to consider conducting combination surveys that are as costly or more expensive than face-to-face surveys. These include: time constraints for completing the overall study, the need for the respondent to have time to study a questionnaire or gather factual information requested before responding, and getting a higher response rate than would otherwise be possible.

CHAPTER IV
DESIGNING THE QUESTIONNAIRE

Questionnaires can be totally designed from scratch or be revisions of previous questionnaires. When previous questionnaires are used as a point of departure, it is usually necessary to modify them for conditions unique to each flood damage study. This may mean only a slight redesign, in which case many of the same questions are repeated word-for-word, or the design of a new questionnaire in which most questions have to be reworded or are completely different. Minor changes in an existing questionnaire may sufficiently adapt it for study purposes while allowing sufficient comparability with data collected over time and in other regions of the country. However, even this type of survey redesign typically involves some reformatting and rearrangement of the questions used in prior surveys.

For Corps analysts one source of previous questionnaires is the Approved Questionnaire Items for Collection of Planning Data (IWR 1984). This compendium of questionnaire items includes, not only items from questionnaires used in previously conducted flood surveys, but also items from other types of water resources development surveys. The compendium is used to periodically (every three years) obtain the necessary Office of Management and Budget clearance for public surveys to obtain planning data. General administrative guidelines for using the OMB approved questionnaires are provided in Engineer Regulation 1105-2-100.

The compendium provides the analyst with a helpful start in identifying appropriate questionnaire items and/or question formats for collection of needed data.

The analyst then proceeds to redesign, reformat, and combine items into an acceptable first draft questionnaire for the desired study (as was done in the development of the prototype questionnaires). Only questions meeting the intent of the OMB approved questions should be used. Several draft iterations are usually necessary before an acceptable final draft questionnaire is developed. This final questionnaire should again be compared to the compendium of approved items to make sure that, at least in a generic sense, all types of included question content has been previously approved.

In addition to adhering to previously approved question content, the analyst must also comply with OMB guidelines concerning implementation of the Privacy Act of 1974 (P.L. 93-579). This Act requires the protection of the privacy (confidentiality) of respondents. The questionnaire design should include introductory statements assuring: 1) confidentiality will be maintained, 2) respondent participation is voluntary, and 3) respondents have the right to refuse to answer any, or all, questions. These statements can be written on the questionnaire to be read by the respondents (Appendix B, page 148), included in introductory or accompanying letters (Appendix B, pages 141 and 142), and/or included in introductory statements made by an interviewer (Appendix A, page 95; Appendix B, page 139).

There are several other particularly important considerations for designing survey questionnaires. These include question relevance, proper construction of questions, validity, reliability, and the overall formatting of the questionnaire. Survey design also depends in part on the method of survey administration: face-to-face, mail,

telephone, or some combination of these methods. The final draft of any survey questionnaire is also dependent upon pretest results and subsequent revisions, additions, or deletions found to be necessary.

QUESTION RELEVANCE

Those who design survey questionnaires often are tempted to include extra questions simply because they think these questions might be interesting to ask. Most often the responses to these questions contribute little or nothing to the survey results. Such questions do not belong in the survey questionnaire, and they constitute a needless imposition on the respondents. All questions should be reviewed to assure they are providing information needed to respond to overall study objectives. To test for relevance, the analyst should ask him/herself exactly how each question relates to one or more of the study objectives, and how the results of the questions might be used. If no link to study objectives can be determined for a question, it probably should be dropped from the questionnaire. Including questions which are obviously not related to study objectives may cause some respondents to refuse to complete the questionnaire, or to answer questions less carefully and thereby reduce the overall validity of response.

QUESTION CONSTRUCTION

Generally in attempting to evaluate how well the questions are written, the analyst should ask him/herself if the questions are stated in as simple and straight-forward a manner as possible. A question should not be ambiguous in its meaning.

There are essentially two basic kinds of survey questions: open-ended questions, to which the respondents reply in their own words; and structured response questions, to which the respondents are provided all possible answers. There are two types of responses which open-ended questions may request. For one type respondents are asked to respond with words, phrases or sentences. For example, Questions 24 in the Appendix A questionnaire (page 103) asked for suggestions for improving flood preparedness and warning systems. When included in mail questionnaires, this type of open-ended question discourages response because of the effort required to compose and write out the answer. Therefore none of these types of questions were included in the Appendix B mail questionnaire. The second type of open-ended question simply asks respondents to give a number as their response. For example, Questions 31-36 in the Appendix A questionnaire (page 106) each ask for either a number of days or dollars as the open-ended response. The inventory forms in both Appendix A and Appendix B also contain this type of question.

In evaluating structured response questions, the answer categories provided should be just as closely scrutinized as the way in which the question is written. In doing this it is important to look for two things: first, the answer categories must be exhaustive; second, they must be mutually exclusive. Exhaustive response categories include all categories that might be relevant to the question. If not exhaustive, the question may deny some respondents the opportunity to select what they feel is an appropriate answer. For example, Question 10 (page 99) in the Appendix A questionnaire asks how respondents first heard the flood watch/warning message.

Ten possible ways were listed as responses. These were all the ways the analyst could conceive possible, and thereby appeared to fulfill the "exhaustive" requirement. However, an eleventh response entitled "other" was provided to be sure the list of all possible responses was exhausted. If in doubt as to whether structured responses provided for by a question are exhaustive, it is good practice to include such an "other" response. If it is desirable to know to what these "other" responses refer, it is also good practice to include a line for the interviewer (or mail respondent) to write in that response as an open-ended addition to such a structured question. Again, Question 10 provides an example of this.

Mutually exclusive answer categories for a question are answers which do not overlap in any way. Question 61 (page 112) in the Appendix A questionnaire, asking household income, is a good example. Analysts often inadvertently violate the mutually exclusive principle with overlapping income ranges such as $10,000-$20,000 followed by $20,000-$30,000. The eleven answer categories to Question 61 are mutually exclusive (do <u>not</u> overlap) because each income category differs from the next by one dollar. This is because most income categories were made to end with 999 while the first number of the next larger category ends in zeros.

QUESTION VALIDITY

An important consideration relating to proper question construction is the validity of survey questions. In order to confirm that a particular question in a flood damage survey is valid, the analyst must be sure that it actually measures what it is supposed to measure. Questions should also be scrutinized to make sure

wording is not used that will bias response in any way.

For example, one objective of the Houston study was to determine the overall effort involved in cleaning up the structure and contents after the flood. A question that simply asked, "What were the costs you incurred or will incur in cleaning your structure and contents?" would underestimate the level of effort, since it would not include the often extensive unpaid labor category. Similarly, just asking "How many hours have you or will you and others spend cleaning up?" would miss the cost of materials and supplies, and, possibly labor provided by commercial enterprises, such as carpet cleaners. Therefore to get a valid estimate of the total cleanup costs, two questions were included in the Appendix A questionnaire (Questions 49 and 50, page 110), one addressing monetary costs and the other unpaid labor.

Questions can also produce invalid results if subject to "response set." Response set occurs when respondents may stop reading or thinking about their answers to interviewer questions toward the end of a list of very similar questions, slipping into a pattern of answering the same way to each question. For example, Questions 12, 27, and 30 (pages 100, 104, and 105) contain lists of reasons for deciding to evacuate (Questions 12 and 27) and for deciding not to evacuate (Question 30) which could potentially induce response set in some respondents. The interviewer reads each one and waits for a "yes" or "no" reply. Many respondents answered "no" to all of these reasons. This could reflect response set in cases where one of the last reasons in the list should have been answered "yes" but was given as a "no." The previous pattern of "no" answers may cause the respondent to respond

automatically towards the end of the list, without thinking (listening to the questions). Response set is difficult to detect or confirm once the survey begins. Where the potential for it exists, lists of survey questions should be carefully pretested reordering the questions in different ways. The best question sequence should then be used. It can also be remedied by breaking lists into two or more parts, each with an introduction likely to keep respondents alert, or by separating the questions with several others, as was done in the questionnaire in Appendix A.

A similar validity problem, the "halo effect," can be remedied the same way. With this problem the response to one question conditions a respondent to respond a certain way to a subsequent question. When this happens, other questions must be interspersed between the problem questions. For example, a respondent may be asked how important he/she thinks it is to evacuate after hearing a warning message. If the person answers "very important" and the following question then asks whether or not he/she did evacuate, there may be some tendency for them to say "yes" even though they did not, just because of the way they answered the first question.

QUESTION RELIABILITY

Reliability refers to the consistency or repeatability of the information produced by particular survey questions. The most common cause of unreliable survey questions is use of words with many different meanings, where the context of the question does not make clear which meaning is being used. Different respondents answer these questions with different meanings of the word in mind. In fact, the same respondents can truthfully answer the same questions differently at different times by

attributing different meanings to a word each time. This is the essence of a reliability problem for a survey question. The analyst can guard against unreliable items by carefully evaluating every word included in a survey question. Other words should be substituted for any found to be ambiguous in the context of the rest of the question and surrounding questions. An example is the importance of specifying exactly what is meant by contents "value" requested from respondents in the inventory portion of the Appendix A and B questionnaires. The Appendix A questionnaire asks for the replacement cost of items if they were new, and the Appendix B questionnaire asks for both the current cash value and the total original purchase cost. Just asking for item "value" would produce unreliable results, because it could not be determined which definition of value respondents were using as a point of reference.

QUESTIONNAIRE FORMAT

Just as important as validity, reliability, and how well survey questions are written is survey questionnaire format and design. The first set of questions is especially critical. It should serve to arouse the respondent's interest and should be applicable to all respondents surveyed. It should also be easy to understand and answer (Dillman 1978).

One of the most important general principles in formatting questionnaires for any type of survey is leaving adequate "white space" between questions and along the margins. This is particularly important for mail and other self-administered questionnaires, to make them appear "easy" to respondents and to reduce any chances for confusion. Not leaving adequate white space can also contribute to errors

in interviewer administered questionnaires by making them more difficult to read or to accurately code responses. The basic rule is to maximize white space. It is generally better to have a six page questionnaire with ample white space than to have all questions crowded onto two or three pages with no space to spare. Accuracy and respondent cooperation may be negatively affected in the latter case.

Another important formatting principle is to group questions by topic or subject area. For example, all questions addressing flood costs and damages should be grouped together on the same page, or on consecutive pages. This helps respondents to concentrate, avoids confusion, and decreases the time necessary to answer all questions. Sensitive questions such as the income, age, and education of respondents generally should be placed near the end of the questionnaire. The last question is often an open-ended request for comments from respondents.

FACE-TO-FACE

The grouping and sequencing of questions in the Appendix A questionnaire illustrates the above points. Questions relating to the flood warning process are grouped together in Part I of the questionnaire (pages 97-105). The first two questions are easy to answer and they apply to everyone. Respondents are asked if they were living at that location at the time of the flood, and when they had been flooded. Questions three and four are similarly easy to answer, though three requires a bit more thought. Subsequent questions become somewhat more difficult. Part II of the questionnaire (pages 106-110), which begins with Question 31, groups together all questions addressing costs and damages. Much of this is factual information which

may be difficult for respondents to recall, and may require them to refer to their own written records or insurance claims. Part III of the questionnaire, entitled "Background Characteristics," (pages 111-112) was the last group of questions asked before conducting the inventory. These included the sometimes sensitive age, education, and income questions, which generally provoke fewer objections and refusals when left to the end of an interview.

The inventory portions of Appendices A and B are structured very differently. The content inventory portion of the Texas survey instrument was designed for face-to-face administration, and required that an interviewer record the information for each content item present in a residence. The fact that an interviewer administered the Appendix A questionnaire made it possible to collect much more detailed kinds of information than was possible in the mail version of the inventory shown in Appendix B. The Appendix A face-to-face questionnaire also included suggested replacement values for contents items. These were used by interviewers to prompt respondents. They could not be included in the mail questionnaire for fear they would be misinterpreted or misused by respondents with no interviewer present.

MAIL

For the mail survey, the inventory portion was placed first instead of last. This was because acquiring these inventory data was the main objective of the survey, and that is what respondents were told. They were also told they could keep a copy of the inventory as an incentive for them for taking the time necessary to complete it. By beginning the questionnaire with the inventory, respondents could immediately begin

realizing this incentive as they tore out their copy as each inventory page was completed.

The inventory part of the questionnaire had to be redesigned extensively for the mail questionnaire so that it could be easily understood and completed by respondents. First, instructions for completing the inventory were written on the inside front cover of the mail survey booklet, facing the first page of inventory items (Appendix B, page 148). Next, copy pages were designed so that respondents could easily identify them and tear them out (they were perforated) for their insurance or other records. Lastly, the number of inventory pages was shortened from that used in the face-to-face questionnaire by combining some rooms, and the number of columns of information requested on each inventory page was reduced.

A booklet format now is generally considered to be the most effective for maximizing response to mail questionnaires. According to one authority (Dillman 1978) on mail surveys, a 6 1/8" x 8 1/4" booklet of 16-pound paper is preferable. When folded, this fits into a 7 1/2" x 3 7/8" envelope. Questions are typed on standard 8 1/2" x 11" paper and reduced 79 percent to fit the booklet pages and leave adequate margins. No questions should appear on either the front or back cover. The front cover of a booklet questionnaire should display an appropriate graphic illustration to stimulate interest. The front cover also should contain the title of the study, the name and address of the sponsor, a short description of the purpose of the study, and any instructions necessary before filling out the questionnaire.

Questions should be typed, mainly, in lower case letters and numbered

consecutively on the left side of the page. Answer categories for the questions should be in all upper case and preceded by numbers, which the respondent is instructed to circle to indicate his or her answer. When possible, answer categories should also be positioned in a vertical line down the page. This creates the important psychological effect of a vertical flow pattern and gives the respondent a sense of making progress in completing the questionnaire. It also maximizes white space between questions.

The Appendix B mail questionnaire conformed to most of the above formatting principles for the "Background Questions" section of the booklet, which comprised the second half of the questionnaire. The inventory portion, comprising the first half of the booklet, was a new innovation. It was also necessary to utilize the inside of the front cover for instructions pertaining to the inventory form. This is because the inventory pages were one sided (due to duplicate pages for respondents).

OTHER REVISIONS FOR A CHANGED METHOD OF ADMINISTRATION

When questions used in one survey are to be used in another that is to be administered differently, changes in question structure are often necessary. The most revisions are necessary when the change is from an interviewer administered questionnaire to a self administered questionnaire. For example, the mail questionnaire in Appendix B included many of the same Marshall and Swift questions as were in Part IV of the Appendix A face-to-face questionnaire, and many of the same inventory items as were in Part V of that questionnaire.

In the face-to-face questionnaire, the Marshall and Swift form (page 115) was used to inventory structural characteristics such as building composition and age.

This form does not have questions written on it, just blanks to enter or responses to circle for various information categories. Interviewers were provided with verbal instructions on how to complete the form either through observation (e.g., for roofing material) or how to ask respondents for non-observable information (e.g., year structure built). For the mail questionnaire, written questions were composed for each category of information desired (see Q1 - Q10, Appendix B pages 161-162). Only the most essential items were included in the mail questionnaire. When reformatted with written questions, almost two pages were required for the items adapted from the one page form.

Converting the inventory portion of the face-to-face questionnaire to a mail format required the most revision. First of all it was decided that it would be next to impossible to obtain as much detailed information by mail as was obtained in the face-to-face questionnaire. Therefore the data requested from respondents was limited to: 1) total number of pieces of each content item, and either 2) total cash value of each type of content item, or 3) a combination of total original purchase cost and number of years ago that the item was purchased. Blanks for this information were arranged in columnar form, and respondents were given the option, in a short instruction at the top of the page, of choosing to provide either the second or third type of requested information. Each page of the mail questionnaire was limited to pertain to no more than one type of room of the house, and was clearly labeled. A detailed explanation of how to fill out each page was provided on the inside front cover of the

questionnaire. It faced the first page (room) of items, and was formatted with lines and numbers to correspond to the column format of the inventory pages.

PRETESTING THE QUESTIONNAIRE

After a questionnaire is constructed it must be pretested one or more times. Most questions written for a survey questionnaire have to be revised several times on the basis of pretests conducted with potential survey respondents. This is a normal part of questionnaire development, and one indication of potential problems with survey questions is when the survey designer admits to not having done this essential pretesting.

The initial pretest is usually done by asking several colleagues who understand the study objectives to read and try to answer the questions, and to reflect on any difficulties in understanding what the questions are asking. In addition, these colleagues may suggest other questions needed to adequately address study objectives or identify questions which should be deleted because they do not contribute to the study objectives.

After pretesting with colleagues, the questionnaire should be pretested with several members of the survey population or as similar a population as possible to those who will be surveyed. An example would be residents of another floodplain near the study area. During the pretest interviews, the interviewer watches for cues indicating respondents are having difficulty in understanding or answering any of the questions. After completing the pretest interviews, respondents are debriefed and

asked if they had problems in understanding or answering any of the questions. Revisions are made to address any problems identified, and another pretest is conducted with several more respondents. This is repeated until the questionnaire appears to be relatively free of problems.

The face-to-face questionnaire in Appendix A was first pretested with colleagues at IWR and the Corps Galveston District. After appropriate revisions it was pretested with several flood victims, at their homes, in different parts of the north Houston suburbs, which had been flooded. Revisions were made at IWR based on these pretest results. Pretests of revisions were not made, because of the cost of traveling to the Houston area, and the fact that no major changes were necessary in the questionnaire.

The mail questionnaire in Appendix B was first pretested with IWR colleagues. It was later pretested with Corps personnel in the Los Angeles and Baltimore Districts, and with County personnel residing in the Santa Ana and Wyoming Valley study areas. Each person participating in the pretest was asked to inventory his/her home contents and answer the survey questions in the same manner as if it had been received by them in the mail. Most comments were given to IWR by telephone, although some questionnaires were returned by mail to check out mail-back procedures. Appropriate changes were implemented to make the mail questionnaire more user friendly. Comments on the cover letters were also received and changes were made to improve them.

The preliminary telephone supplement to the mail questionnaire was also pretested. The Survey Research Lab at Virginia Commonwealth University (VCU) first prepared the telephone script and submitted it to IWR for review. Several changes were made based on this review. The final telephone script was then pretested with a small number of respondents taken from the sample drawn for the study. There were minor problems with some of the questions which were corrected before full scale telephone interviewing was allowed to begin. Telephone pretest interviews were retained as part of the final data set, because they were part of the sample. The only loss in data from these pretest questionnaires was for some of the problem questions which were unanswered.

CHAPTER V
DESIGNING AND DRAWING THE SAMPLE

Usually the population to be surveyed is too large or too dispersed for it to be feasible to collect data from everyone. The population must therefore be sampled and data collected from only those members of the population selected in the sample. Typical populations surveyed for flood damage studies are all adult occupants of flooded residences within an area. With very small flood damage populations, it may be possible to collect data from all population members. This is the ideal case, but in most situations a sample must be drawn.

The general steps for designing and drawing a sample for flood damage surveys are covered in this chapter. There must be a population to be sampled. This population is further described by the sampling frame or list of population elements which have known probabilities of being drawn in the sample. A sample size adequate for purposes of the study is determined. One of several alternative probability sampling methods is selected and the sample drawn. These steps are briefly described in this chapter. A more detailed discussion of the basics of survey sampling is provided by Moser and Dunning (1986) in Chapter II of The National Economic Development Procedures Manual - Recreation, Volume II, A Guide for Using the Contingent Value Methodology in Recreation Studies.

SAMPLING FRAME

The first step in survey sampling is to carefully define the population that is being surveyed and then to reduce it to a "sampling frame" or actual list of population

members, from which the sample will be drawn. It is important to select an appropriate sampling frame to adequately address the study objectives. When collecting data to compute depth-damage functions, map delineation of the appropriate floodplain is one way to define the sampling frame. For example, identifying structures within a 100 year floodplain by overlaying a floodplain map onto a map of subdivisions, would constitute a viable sampling frame for certain surveys. A sample could be drawn from such a frame so that all structures of interest within this frame, and only those structures, would have a known probability of being selected.

The "structures of interest" are determined by the purpose of the study, and the sampling frame must be defined accordingly. Two different types of survey populations are often of interest following a flood. A population consisting of only those structures which have been flooded is of interest for studies concerning historic flood damages (e.g. studies to develop depth-damage relationships). Other structures which were not flooded would not be included in this sampling frame. In contrast, a population consisting of both those structures which have been flooded and those not flooded might be of interest in a survey to assess the effectiveness of flood watch and flood warning messages. Residents receiving and potentially responding to these messages would not be limited to structures actually flooded.

SAMPLE SIZE

A needed sample size can be calculated for every question in a survey questionnaire. The calculation is generally made, however, only for a few questions that provide the data considered most important relative to the study objectives. For

example, Question 39A in the Appendix A questionnaire provides numerical data on the cost of flood damages to structures. This is typically a very important data need, and might be one question which would be used for sample size calculations.

A sample provides an estimate of what one would find if every member of the sampled population were to be surveyed. There is always some error associated with any sample. The amount of sampling error that one is willing to tolerate, or the amount of precision required, is the criterion generally used to determine sample size. The precision value is determined by the analyst as the number of percentage points of error away from the true mean that can be tolerated in the sample estimate of the true mean. The analyst must also decide the amount of confidence he or she wishes to have in attaining the desired level of precision. In general, the greater the precision and/or the greater the confidence desired, the larger the sample size needed.

NUMERICAL QUESTIONS

For numerical questions the following formula can be used to determine the sample size:

$$n = t^2 * \frac{s^2}{(\bar{Y} * r)^2}$$

where,

n = The sample size

s^2 = The variance (std. deviation squared) of critical variable. It is a best guess estimate for the study, usually the variance found in a similar study completed in the past. Another best guess estimate for the variance is the difference in the high and low values that might be expected for the variable divided by four Schaeffer et al. 1979, p. 43). It is wise to use a conservative (large) estimate of variance in this formula so as not to have the actual variance, found after data are collected, to be larger, thus creating more error than desired.

$\bar{Y}$ = An estimate of the mean of the critical variable, typically taken from a past study.

r = The level of precision desired (e.g., .05 or .10). This is the number of plus or minus percentage points of tolerable error, away from the true mean of the variable for which the sample size is being calculated.

t = The t table value corresponding to the probability that the resulting sample estimate of the variable mean will be within the specified range of precision. For example, a "t" value of 1.96 would provide 95% confidence that the estimate of the mean is within the number of percentage points of the true mean specified by the level of precision. Other commonly used "t" values are 2.58 for 99% confidence and 1.65 for 90% confidence.

For example, assume that the critical variable being considered (Y) is the estimate of structural damages. In a previous study the mean ($\bar{Y}$) of this variable was $10,000 and the standard deviation (s) was $15,000. If the criterion was for the mean of the survey estimate to be within 10% (r) of the actual mean damage value 95% of the time (t table value of 1.96), the resulting sample size would be 864. Inserting these numbers in the formula, we have:

$$n = (1.96)^2 * \frac{15{,}000^2}{(10{,}000 * .10)^2} = 864$$

CATEGORICAL QUESTIONS

A different formula is used to calculate sample size for questions resulting in categorical results expressed as proportions of respondent answers. An example would be the proportion of respondents saying "yes" they had received a flood warning. The following formula can be used to calculate the sample size necessary to produce the desired level of precision of results for such a question:

$$n = \frac{t^2 * pq}{(rp)^2}$$

where,

n = The sample size

p = An estimate of the proportion "p" of response for the question answer category of most interest (e.g. "yes" responses).

q = The proportion of other responses to the question (i.e., q = 1 - p).

r = The level of precision desired (e.g., .05 or .10). This is the number of plus or minus percentage points of tolerable error, away from the true proportion of the question category response for which sample size is being calculated.

t = The t table value corresponding to the probability that the resulting sample estimate of the proportion will be within the specified range of precision. For example, a "t" value of 1.96 would provide 95% confidence that the estimate of the proportion is within the number of percentage points of the true proportion specified by the level of precision.

SMALL POPULATIONS

For smaller populations where the sample constitutes 5 percent or more of the total population, the same desired level of precision can be obtained with a relatively smaller sample size. Multiplying the results of the above formulae by a finite population correction (fpc) factor will provide an estimate of the final sample size needed for such cases. With N being the population size and n being the initial sample size estimated by one of the above formulae, the fpc is calculated by:

$$fpc = \frac{N - n}{N - 1}$$

Continuing the previous example, if the sample of 864 was calculated for a total population of only 2000, the fpc correction factor would be (2000 - 864) divided by

1999, which equals 0.568. Multiplying 864 by 0.568 would reduce the needed sample size to 491. The fpc should not be used, however, if $n \leq N/20$ (Schaeffer et al. 1979, p 36.).

SMALL SAMPLES FROM LARGER POPULATIONS

For some types of surveys, small samples resulting in very low precision may be tolerable. For example, it may be desirable to determine if housing values derived from an earlier survey are still appropriate to use. This could be accomplished by conducting a survey with a small size "n" that could be quickly completed. Such a small update survey would have very low precision for the resulting housing values obtained. However, this may be acceptable if the objective is simply to see <u>whether or not</u> housing values have increased, not precisely how much they have increased.

ALTERNATIVE SAMPLING METHODS

After the size of the sample has been determined, attention is turned to sample selection procedures. Care must be taken to design a sample in which all members of the population being sampled have either equal or known probabilities of being drawn as part of the sample. The analyst should guard against subjectively choosing a sample and calling it "random."

SIMPLE RANDOM SAMPLING

Simple random sampling is usually the most desirable type of sample design. A number of members of the population equal to the desired sample size are independently drawn by using a random number table or some other method of randomization. The sample is constituted by randomly drawing non-duplicative

numbers[2] until the desired sample size is achieved. The sample numbers drawn each correspond to unique numbers assigned to all units of the population being sampled. For example, to draw a sample of 50 residences, a listing of all residences in a flooded region must be numbered. The first residence on the list is assigned number one, the second number two, and so on to the end of the list. If there are more than 99 but less that 1000 residences on the list, then 50 three digit numbers (for example, 001) can be drawn from a random number generator or table to achieve the required sample size.

SYSTEMATIC SAMPLING

A systematic sample (sometimes referred to as a sequential or interval sample) can be considered a random sample if the listing from which it is drawn is randomly constituted, if the starting point is randomly selected, and if the entire listing of the population sampling frame is sampled. With this kind of sample the first unit of the population selected for the sample should be randomly selected, using a random number table or some other method of randomization. Thereafter, every nth member of the numbered population list is automatically selected, where "n" is the interval or sampling fraction needed to acquire the desired sample size by going through the entire list sequentially (in other words, n is equal to the size of the population divided by the size of the sample).

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[2]Drawing non-duplicative numbers refers to sampling "without replacement," where numbers drawn from a population are <u>not</u> replaced back into the population and therefore have no chance of being drawn again in the sample.

In addition to the requirement of a random starting point, it is also necessary for the list to be randomly constituted. Alphabetically constituted lists are usually acceptable. However, if there is any periodic bias occurring in the list, it could produce a similarly biased sample. For example, if the sampling interval or sequence was 10 and every tenth house chosen in a residence sample of a flooded area was situated on top of a hill, then average flood damage reflected in the sample would probably be much lower than the actual average for all residences flooded.

For face-to-face household surveys, systematic samples are often more efficient to use in the field than simple random samples. After arriving at the random starting point for interviewing in the field, interviewers simply move systematically through the entire sampling list selecting every residence encountered at a given interval determined by the required sample size. This is usually very efficient, because such lists often can be constructed on the basis of geographical proximity of listed structures, such as the sequential occurrence of homes located on a city block. For example, if the desired sample size is fifty and the list contains 500 residences, every tenth residence on the list is selected to be included in the sample. To make the sample random, a number between one and ten must to be selected from a random number table to see which of the first ten houses on the list would be the starting point for the survey. If the list is constituted in the same order as residences are located on the ground, interviewers can efficiently walk from the first selected residence selected to the next one, ten houses away, and to every subsequent tenth residence.

CLUSTER SAMPLING

For cluster sampling, the population units to be sampled and analyzed are first aggregated into larger units or clusters. For example, each city block might be defined as a "cluster," including all houses on that block. These clusters are then treated as substitutes for the ultimate units of analysis (usually households) for purposes of drawing the sample. A sample of the clusters is then drawn, usually either sequentially (with a random start) or by a simple random sample. All houses on each randomly selected block ("cluster") then are surveyed.

In household cluster sampling, a cluster of several households is substituted for the individual household as the unit used for drawing the sample. For face-to-face household surveys involving large geographic areas, clustering is usually more efficient for the overall survey than simple random or systematic sampling. This is because less interviewer travel time is generally required than for samples in which each selected house is in a different geographic location.

In a flood damage survey, the clusters would usually be groups of houses in the geographic areas which have been flooded. Interviewers would simply go to all houses in each cluster before moving on to another cluster location. The clusters themselves should be randomly selected so as to be representative of all geographic areas being sampled. Clustering produces a somewhat larger sampling error than when the population units to be sampled are selected individually for the same size sample. A larger cluster sample can be drawn to compensate for this.

For relatively small populations in small geographic areas, a large sampling fraction (proportion selected for the sample) is often required to obtain the desired sample size. In such cases clustering may not be any more efficient in time and money than other sampling methods. For example, if a 50 percent sample is to be drawn of 200 households within one flooded "reach," selecting every other household with a systematic sample may be just as efficient for interviewing purposes as randomly selecting ten clusters of ten consecutive households each.

MULTI-STAGE SAMPLING

Multi-stage sampling is a technique which is useful for sampling large geographic areas for face-to-face interviews. It is often confused with cluster sampling, because the final "stage" may involve selecting clusters rather than individual units of analysis. In this sense the ultimate sample selected with this method <u>may</u> be a cluster sample. But this is not always the case, and even when it is, there is more to sequential sampling than that. The important fact is that one or more preliminary stages of sample selection precedes the final stage selection of sampling, the stage where the actual units are selected from which data are to be acquired.

Multi-stage sampling designs are advantageous for sampling large dispersed populations. When large geographic areas must be sampled and interviewers sent to each residence selected, it is usually too time consuming or expensive to survey all the dispersed residences that would be drawn in a normal random or sequential sample. Multi-stage sampling is also a useful technique to use when no listing of the

population to be sampled is available. The simplest case of multi-stage sampling would be a two-stage sample of a large metropolitan area, where separate samples are drawn at both the first and second stages. At the first stage a list of primary sampling units such as census tracts or city blocks is compiled. This list is sampled using either a simple random or a systematic sample, but the resulting sample is not surveyed. Instead, each of the blocks or census tracts selected in the first stage sample is subdivided into secondary sampling units (e.g. residences). These secondary sampling units (residences) are then sampled in the same proportion or percentages as the first stage units were sampled. For example, if 50 percent of the city blocks are selected in the first stage sample, then 50 percent of the households within each city block are selected in the second stage sample. Each of these selected residences is then included in the survey.

More than two stages may be appropriate for very large geographic areas. No matter how many stages are used, the first stage of multi-stage sampling is always at the most macro level and only the units selected in the final stage are included in the survey. An example of a case in which a four-stage sample might be appropriate is a large urban region with many separate geographic floodplain areas containing several census tracts each. As a first stage of sampling, the floodplain areas would be numbered and a sample of them drawn (e.g., 50 percent). The second stage sampling would be to draw samples of census tracts within each selected floodplain, in the same (50 percent) proportion, as the first stage sample. The third stage would be to draw samples, in the same (50 percent) proportion, of city blocks from within each

of the selected census tracts. The fourth stage would then be to draw samples of households, in the same (50 percent) proportion, from within each of the selected city blocks. The households selected in this fourth stage of sampling would constitute the final desired units of analysis to be included in the survey.

STRATIFICATION

It is often possible to reduce sampling error and get more precise sample estimates of population characteristics by stratifying the population into homogeneous sub-groups before the sample is drawn. A separate sample is then drawn from each sub-group and the results combined to comprise a complete stratified sample. Some key variables on which flood damage survey samples may be stratified include flood zones, urban subdivisions, and one or more structure characteristics. To stratify the sample on any one of these variables, it is necessary to have complete information for that variable for the entire population.

For example, a sample could be stratified on all three of the following structure characteristics: 1) purpose of structure (e.g., residential vs. commercial), 2) number of stories (e.g., single vs. multiple stories), and 3) whether or not a basement was present. This stratification would delineate the following eight different population sub-listings (strata):

1) Single storied residential with a basement,
2) Single storied residential without a basement,
3) Multiple storied residential with a basement,
4) Multiple storied residential without a basement,
5) Single storied commercial with a basement,
6) Single storied commercial without a basement,
7) Multiple storied commercial with a basement, and
8) Multiple storied commercial without a basement.

A separate sample would then be drawn for each of the eight strata, assuming each is represented in the population.

Normally, stratified samples like the above example are drawn proportionate to the actual population proportions of characteristics used for stratification. If 20 percent of the structures in the population list were single storied residential with a basement, then 20 percent of the stratified sample would be single storied residential with a basement, and so forth. However it is sometimes necessary to proportionately oversample some of the smaller sub-groups (strata) to assure adequate data are collected for later analysis.

The survey populations of residences in the Santa Ana River Valley and in the Wyoming Valley were stratified by disaggregating each of them into three separate subgroups (strata) corresponding to the flood risk zones in which they were located. Figures 1 and 2 show how these areas were mapped (stratified) by flood risk zones prior to drawing the samples for both surveys. The analyst preferred obtaining relatively equal sized samples from each flood risk zone to assure adequate data from each zone for analysis. Therefore samples for the Santa Ana and Wyoming Valley surveys were drawn so as to disproportionally oversample the smaller flood risk zones (equal sized samples were drawn from each zone). The resulting Wyoming Valley sample was the most disproportionate. Only 3.5 percent of the population resided within one of its flood zones, but one third of the sample was drawn from that zone. One third of the sample was also drawn from each of the other two zones, which had 30.5 percent and 66 percent of the population, respectively.

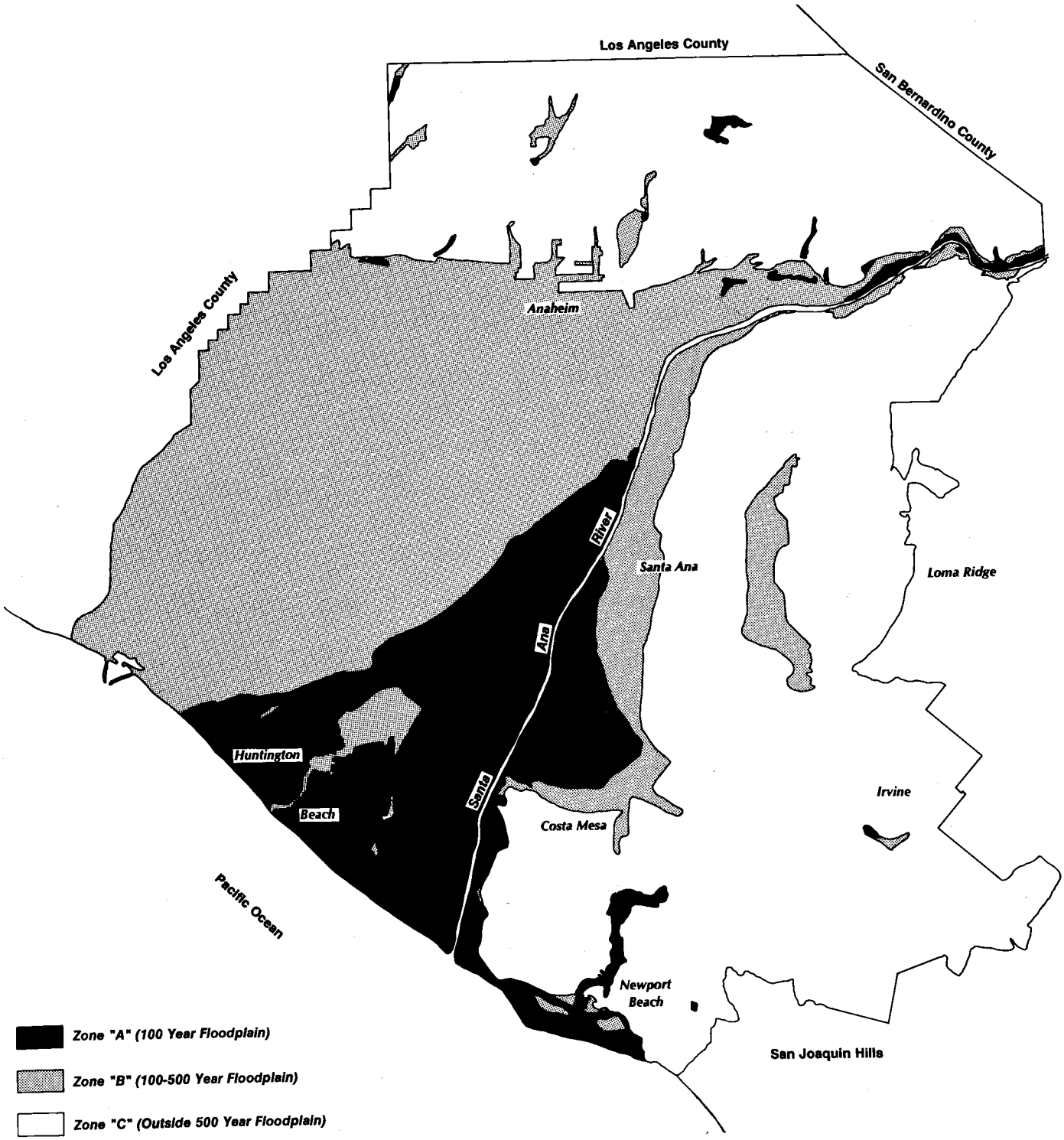

FIGURE 1. GEOGRAPHICAL STRATIFICATION OF FLOODPLAIN - SANTA ANA STUDY AREA

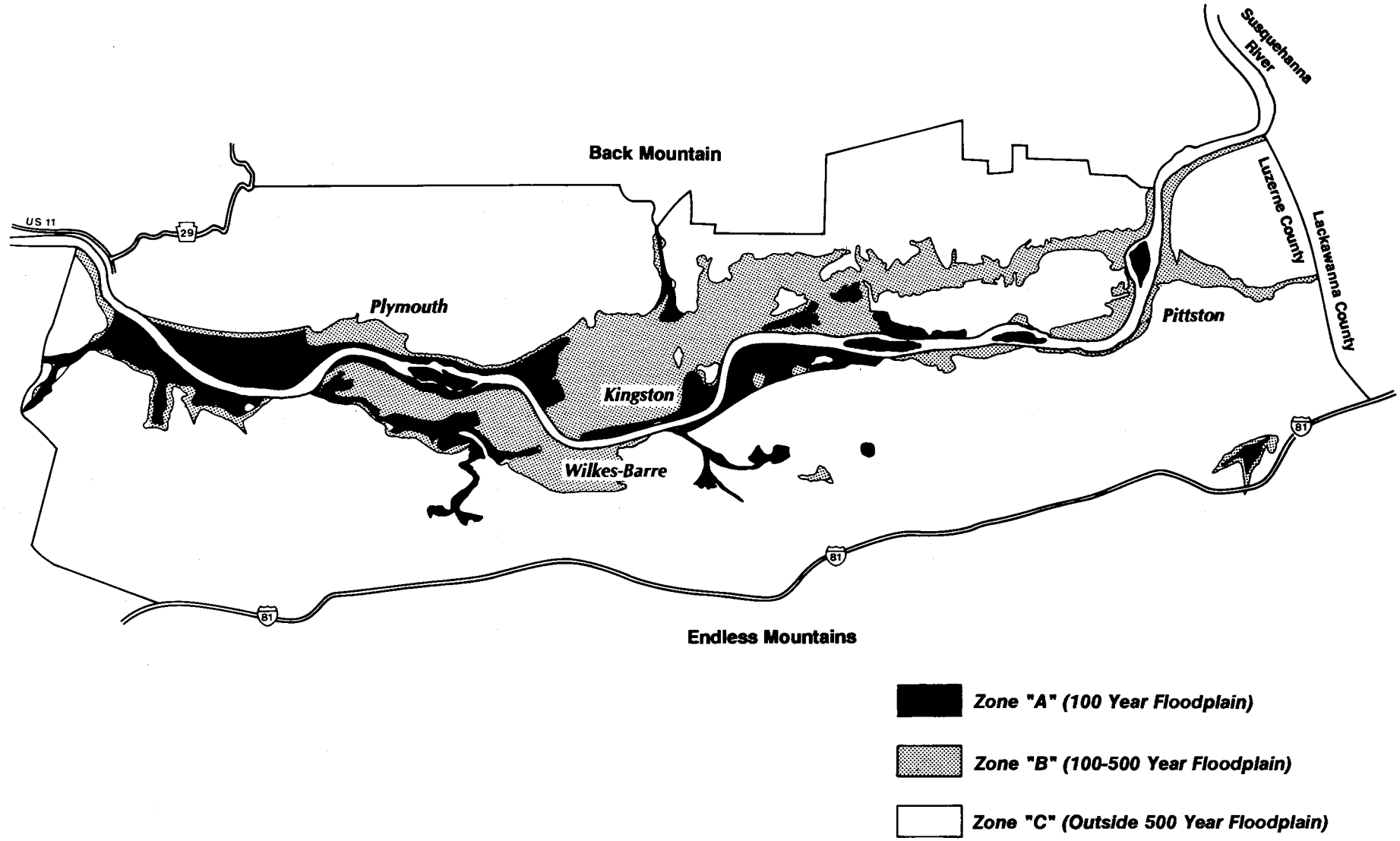

FIGURE 2. GEOGRAPHIC STRATIFICATION OF FLOODPLAIN - WYOMING VALLEY STUDY AREA

SPECIAL CONSIDERATIONS

SMALLER SAMPLES

One way to economize on survey costs is to draw smaller samples than would normally be desired. Smaller samples have higher sampling error than larger samples, making them potentially less accurate. There is less reduction in accuracy of sample estimates for reduced sample sizes for populations which are very homogeneous in their characteristics. This is because, in addition to sample size, sampling error is also a function of the amount of variance in the population for any given characteristic. An example of a homogeneous population with respect to depth of flood waters and structure type would be a relatively flat floodplain area where all houses are approximately the same size and value. Here variance in flood damages between houses would be lower than in a floodplain region with houses of different sizes and values built at different elevations above sea level.

Another way to improve the accuracy of survey data collected with small samples is to pay particular attention to controlling non-sampling error. This is because total survey error is a function of both sampling error (based on sample size and variance) and non-sampling error. Non-sampling error includes sample selection error, non-coverage (sampling frame) error, non-response error, data collection errors, and data processing (office) errors (Kish, 1965). Much of non-sampling error is simply human error, which can be as large or larger than sampling error.

Some aspects of non-sampling error are easier to control with smaller samples because, typically, fewer personnel are involved and the scope of small sample

surveys tends to be limited. Sample selection error can be minimized by ensuring that whoever selects the sample does it in a truly random manner. To minimize sampling frame error, careful pre-survey field reconnaissance is necessary to make sure that no qualifying units of analysis are omitted from the list of residences constituting the frame from which the sample will be drawn (e.g. houseboats or other non-typical dwellings). Non-response and data collection errors can be reduced by such things as preparing high quality hand signed letters for mail surveys and high quality interviewer training and supervision for face-to-face and telephone surveys. For example, monitoring of interviewer performance in the Houston survey revealed that some interviewers were turning in survey forms without the required contents inventory data. Corrective measures resulted in minimizing this non-response error for the balance of the interviewing. Replacing hand coding of data with automatic computerized data file generation, as is done with computer assisted telephone interviewing (CATI) systems or computerized face-to-face questionnaires, helps to minimize data processing errors.

SMALL SAMPLES OVER TIME

Some study objectives may not require large survey samples. One such objective may be checking for changes in areas that are flooded often (e.g. changes in structure or content values). For this objective, drawing a series of small samples from a population over time may be preferable to conducting one large sample survey at one point in time. The trade-off for these multiple data points over time is less precision at any one point in time due to the smaller sample sizes.

Another reason that small samples may be required is the need to stay within budget constraints. A small sample may be better than none at all, if that is the best that the available budget will allow. The formulae on pages 45 and 46 can be used by the analyst to determine the amount of precision that can be achieved with the affordable sample size. A sensitivity analysis can be performed, by slightly increasing or decreasing the sample size, to determine whether or not a small increase in the survey budget would substantially reduce the potential survey error. If this analysis indicates unacceptably high error from the largest possible sample size, a purposeful (rather than haphazard) selection of representative survey units may be used to help ensure meaningful data collection results. This is only true if the sample can be carefully designed to ensure representativeness. Otherwise results are likely to be misleading. Each survey unit should be carefully selected so that, in aggregate, they represent each known major difference in the population that might be a significant determinant of a critical variable. This would be called a purposive sample, because it is subject to the professional judgement of the analyst whose purpose is to ensure that the sample represents all population characteristics important to the study.

CHAPTER VI
SURVEY IMPLEMENTATION

INTERVIEWER SELECTION

Prior to survey implementation, interviewers must be selected and trained for face-to-face and telephone surveys. The requirement of involving interviewers in the survey process has direct implications for the quality of data obtained by these two survey methods. Careful interviewer selection and training is essential for quality results. It is therefore important to have a highly competent person in charge of selecting and training interviewers.

INTERPERSONAL SKILLS

The best persons to select as interviewers are individuals who have good interpersonal skills and are not likely to be perceived as a threat by those who are to be interviewed. The principle of being non-threatening is more important than many other characteristics of interviewers. For instance, tone of voice and clarity of speech are important screening variables for selecting good telephone interviewers. Middle-aged women often make very good face-to-face or telephone interviewers because they tend to be perceived as non-threatening by most segments of the general population.

All interviewer applicants should be screened, and the best selected, based upon their attitudes toward people, non-threatening demeanor, apparent patience, and positive references. Appropriate dress and general appearance is also important for face-to-face interviewers. Patience is an especially important characteristic for good

interviewers. It is sometimes necessary to be very patient while waiting out extensive unrelated commentaries, opinions on tangential issues, or hostile outbursts from respondents. Interviewers must be able to patiently wait until these are over and then calmly redirect the discussion, resisting any urge to acknowledge or in any way encourage this kind of undesirable respondent behavior. Interviewers must never feel they have the right to argue with, or provoke, the respondent on these kinds of occasions, and applicants who will not accept this behavioral constraint should not be hired.

It is also often preferable for face-to-face flood damage surveys to select interviewers who are comfortable working in two person male/female teams. Although experience to date has shown that interviewers working alone can do the job, team interviewing may often be advisable. It can improve the interview from the standpoint of maximizing rapport with interviewees during long interviews. It can also shorten total interview time when a contents inventory is part of the survey, by allowing team members to concurrently conduct inventory and other interview tasks, provided these tasks have been clearly defined as mutually exclusive. Team interviewing may also be advisable from the standpoint of interviewer safety, especially for female interviewers.

SOURCES

Conducting a survey often requires many interviewers working on the survey for a relatively short period of time. Interviewer personnel needs often require outside recruitment and selection. Colleges and universities can be an excellent source of

dependable and low cost student interviewers. For example, interviewers were recruited from the University of Houston and Prairie View A & M University to administer the face-to-face survey questionnaire in the Houston study. Most interviewers recruited for the Santa Ana/Wyoming Valley telephone survey were Virginia Commonwealth University (VCU) students in Richmond, Virginia. At times of the year when university students are not available, interviewers can be recruited by placing a newspaper advertisement, briefly describing the type of survey (face-to-face or telephone), for which interviewers are required. Some of the Santa Ana/Wyoming Valley telephone survey interviewers were recruited from the general population of the Richmond metropolitan area by placing such newspaper advertisements.

It is often cost effective to contract or sub-contract telephone survey work to a telephone survey research institute, or independent survey research firm. In addition to being equipped with a computerized telephone research laboratory, they usually maintain a pool of trained interviewers. Their interviewers can be moved from completion of one survey project to a new project with minimal retraining.

INTERVIEWER TRAINING

FACE-TO-FACE

Adequate training for face-to-face interviewing usually requires one to two days. The training procedure followed for the Houston flood damage survey is illustrative of what should be involved.

Training of the interviewers began at 9 a.m. The trainer first gave a 15 minute orientation to the day's training activities. Then trainees were given a copy of the

questionnaire to be used in the flood damage survey. An hour and 15 minutes was spent familiarizing trainees with each question. The trainer read through each question, modeling appropriate interviewer behavior for asking each. Then the rationale for each question was explained so that everyone understood its importance.

Following a 15 minute break, a 30 minute audio tape was played which illustrated several principles of good interviewer performance. Trainees followed along with a copy of the questionnaire being used on the tape. Interviewers were trained to read questions exactly as written, so as not to introduce their own interpretations of question meaning. A 15 minute question-and-answer period followed.

The trainer then presented a 30 minute mini-lecture to: 1) sensitize trainees to some special considerations for interviewing flood damage victims, and 2) review some of the basic principles and tasks of face-to-face interviewing. Trauma associated with being a flood victim and the need to listen patiently to victims who insist upon "telling their stories" were emphasized. In addition to listening techniques for dealing with trauma, techniques for dealing with "displaced aggression" and other potential forms of hostility were discussed.

After a one hour lunch break, trainees were given two handouts, one listing common "feedback phrases" and another listing common "probes." Feedback phrases are used to assure the respondent, in a positive way, that he or she is adequately responding to the interviewer's questions. Probes are used to prompt the respondent to provide additional or more precise information in response to a

question. Trainees participated in an hour long exercise utilizing audio tape examples of appropriate and inappropriate probes and feedback phrases.

The form for inventorying household contents was then handed out. An hour was spent explaining how to conduct a household contents inventory, using each item in the form. Division of inventory tasks between each person in two person teams was explained as the most expedient way to complete the inventory. Trainees were instructed to attempt to persuade flood damage victims to allow them to walk through their house and record contents on a room-by-room basis. They also were instructed to probe the memories of victims regarding contents that may have been damaged and not replaced. Alternative procedures for identifying and determining values of content items which cannot be observed were also explained.

After a 15 minute break, trainees were instructed to pair up and role play one complete interview, including the inventory of household contents. Trainees conducting these hypothetical interviews were instructed to write all answers down on the questionnaire and to hand in completed questionnaires at the end of the role playing session.

After the first role playing interview was completed, those trainees who had acted as hypothetical flood victims were instructed to switch roles and become interviewers. A second round of role playing was then conducted, at the end of which the completed questionnaires were again collected. A subsequent debriefing session was held to go over any questions arising from the role playing experience. At this time interviewers were sensitized to the need to record data in the specific places

called for in the questionnaire, and in a legible manner. It was explained how important this is for the task of later accurately coding the data into computer files. A question and answer period ended this first day of training at 5 p.m.

A second day of training is advisable. Normally, the second day of interviewer training begins with one half hour of critique by the instructor on the way data had been recorded on the previous afternoon's role playing questionnaires. The importance of recording data legibly and exactly in accordance with the written interviewer instructions is again emphasized.

Each trainee may then be given an opportunity to participate in one more role play interview with a different partner than the day before. This takes approximately one hour and 15 minutes, and is followed by 15 minutes of questions and answers.

After a 15 minute break, trainees are briefed on how they will spend the rest of the day conducting practice interviews in the field. First, they are assigned a partner. Trainees hired especially for the study are paired with experienced personnel or training consultants. In each case, the designated person in charge for each team should have had interviewing experience. Each team ideally is given two addresses at which appointments have been made for them, one at mid day and the other at mid or late afternoon. They are then told to leave and have an early lunch, so as to arrive on time for their first interview. Each team member is instructed to conduct only one of the two interviews. The experienced person should conduct the first interview, modeling appropriate behavior for the inexperienced interviewer.

All trainees are instructed to be back at the training site by 5 p.m. for a debriefing session. They are also instructed to note any problems encountered during the day with either the survey questionnaire or contents inventory form. During the debriefing, any problems are discussed and all completed questionnaires are turned in to the instructor.

TELEPHONE

The training of interviewers for the telephone screening phase of the Santa Ana and Wyoming Valley surveys is illustrative of the kind of training needed. The Telephone Survey Research Institute of VCU was sub-contracted for this phase of the study. They hired and trained all of the interviewers for this work.

The VCU Survey Research Lab begins its training by giving each new interviewer a paper copy of the telephone survey questionnaire to take home and study. A sequence of supervised role playing and practice interviews is then followed, similar to the procedure described for training face-to-face interviewers.

The VCU telephone interviewers are taught to use a computer assisted system of telephone interviewing (CATI), in which the questionnaire questions are read to respondents over the telephone directly from a computer screen. Interviewers must correctly enter responses on the computer keyboard in the form of appropriate code numbers.

Telephone interviewers must also be taught "call-back" procedures for those respondents who are not at home or who are too busy to complete the interview when

first called. The telephone interviewer is taught how to try to persuade these people to agree to another time when they can be called back and the interview completed.

IMPLEMENTATION

Face-to-face, telephone, and mail surveys are all implemented somewhat differently. This is illustrated by descriptions of the implementation of the face-to-face survey in Houston and the telephone and mail components of the surveys in the Santa Ana Basin and Wyoming Valley.

No matter the type of survey used, it is important to gain the awareness and trust of potential respondents. Local officials can be important partners in communicating the need for cooperation by the public and the benefit to the public of the effort. Press releases in local newspapers can be used to announce forthcoming survey efforts, to identify the support of and/or level of participation by local officials, and for local officials to request cooperation by the public. Although it is realized that many individuals will not be reached by press releases, they will reach many in the community not sampled, thus creating more awareness and potential support for the survey effort. As described below, survey materials, including introductory or cover letters and opening interviewer comments, should also identify participation by local agencies and local officials that can be contacted for validation of the survey effort.

Provided there are no major problems with the survey questionnaire or inventory form, the first day of survey implementation should be the day immediately following interviewer training. Interviewers are told that the study is now beginning, but that on this first day they are still to look for and report any perceived problems

with either the questionnaire or the assigned procedures. A debriefing session is held for this purpose at the end of the day.

FACE-TO-FACE

A letter announcing the survey (Appendix A, page 93) was mailed to all floodplain residences shortly before field surveying began. The letter indicated approximately when surveys would be conducted, gave three reasons why it was important, and provided points of contact (with telephone numbers) for additional information at the Corps Galveston District Office and the Harris County Flood Control District (the local project sponsor). It also indicated that the Harris County Police Department would verify the identity of interviewers if requested. Each interviewer also provided potential respondents with a letter of introduction (Appendix A, page 94) containing the same information. Both of these letters were signed by the Acting Director of the Corps Institute for Water Resources.

A quota of two to four interviews per interviewer was assigned each day by a field supervisor for the Houston Corps flood damage survey. Their household interview locations were also assigned to them by the field supervisor, who referred to a listing of households to be included in the sample.

Data collected from households the first day of the study should be temporarily held apart from the rest of the total listed sample. Data from these first interviews may later be added to data gathered in the full study sample, provided no major problems occur. If problems occur, the data collected this first day can be discarded without materially affecting the overall study sample. If problems occur the first day,

interviewers are told to delay reporting back for work until the day when corrections in the questionnaire and/or procedures have been completed.

One study supervisor should be assigned to oversee the interviewers each day in the field. This supervisor should see to it that all completed questionnaires and inventory forms are collected at the end of each day. The supervisor should check over each one of these for data recording errors and legibility. Errors must be corrected before the completed instruments are filed for computer data entry. The supervisor is also responsible for all field logistics and for controlling close adherence to the sample of households drawn for the study. Scheduling of interviewers is another supervisor responsibility. Some must be assigned to work evenings, since this is the only time certain residents can be found at home. Safety of the interviewers is another supervisor responsibility. The supervisor should know at all times generally where every interviewer is in the field. It is advisable to have periodic meetings between the supervisor(s) and interviewers. Interpersonal problems and disciplinary actions are also the concern of the field supervisor.

TELEPHONE

Computer assisted telephone interviewing (CATI) was used to implement the Santa Ana/Wyoming Valley surveys. The telephone survey script used is provided in Appendix B, pages 139-140. With CATI all questions are programmed to automatically come up on the screen to be read by the interviewer in the sequence desired. Skips or branches in the questionnaire can be included in the programming, automating this task for the interviewer. Another important aspect of CATI is that the

interviewer uses the computer keyboard to directly enter responses into a data file. As mentioned in the previous chapter, this reduces human error by eliminating the need for hand recording responses onto survey forms and the subsequent need for manual data coding. The CATI system also allows for programmed restrictions on what response data the interviewer can enter, thereby further reducing potential data entry errors.

One key to implementing a high quality telephone survey is having a highly qualified person supervising it. The supervisor should be constantly monitoring the telephone survey process. The VCU telephone survey supervisor is seated at a desk on one end of the lab, facing toward a semi-circle of telephone work stations. Telephone interviewers sit at the work stations facing toward the outside wall of the lab looking into their computer screens, and are surrounded on three sides by sound-proof wall partitions. The supervisor periodically monitors the telephone interviews. The supervisor can also observe the progress of data entry on his/her own computer terminal. In this way the supervisor can check to see if questions are being asked properly and if the data are being entered correctly. At the VCU Survey Research Lab the ratio of interviewers to supervisors is never more than 5 to 1.

The telephone phase of the Santa Ana/Wyoming Valley surveys was primarily used to identify individuals willing to complete a detailed mailed inventory and survey form. The interviewers also verified the correct complete mailing addresses for the respondents.

MAIL

The Santa Ana and Wyoming Valley mail surveys were implemented with graduate student personnel supervised by the Director of the Center for Public Affairs and the Chair of the Department of Urban Studies and Planning at VCU. The mailings were conducted from a room in the Urban Studies and Planning Department dedicated to that purpose for the duration of the survey. It was possible to mail a questionnaire to all residences in the sample within one week of their initial telephone contact, by using computerized mailing lists from which appropriate mailing labels could be generated.

The mail survey was conducted in three "waves." The first wave consisted of mailing a questionnaire with accompanying materials to everyone who had agreed, by phone, to participate in the survey. This mailing was initiated by the graduate students by first checking the address mailing labels provided from the telephone survey to be sure they were located within the survey boundary. Next they selected a color coded mail questionnaire corresponding to the flood risk zone in which the address was located (see Figures 1 and 2 on pages 56 and 57). Blue was for the highest risk flood zone "A" (100 year flood plain), grey for zone "B" (100-500 year flood plain), and green for the lowest risk flood zone "C" (outside 500 year floodplain). The color code was used to separate completed return questionnaires into proper flood risk zones for data coding and subsequent analyses. The questionnaire was then placed in an envelope together with a hand signed cover letter Appendix A, page 141), a postage paid return envelope, and a postage paid return post card (page 142).

This post card was to be returned, signed by the respondent at the same time as, but separate from, the questionnaire. It informed researchers the completed questionnaire was being mailed back separately. In order to ensure confidentiality, no respondent identification was attached to the questionnaire itself.

Upon receiving the return post card with the respondent's signature, student employees deleted the respondent's name and address from the computer file of mailing addresses. Upon receiving the completed questionnaires, the student employees gave each returned questionnaire a sequential code number, which also indicated whether they had been sent back from the Santa Ana or from the Wyoming Valley sample, and which of the three flood risk zones they were from (as indicated by the color code).

The second "wave" of the mail survey implementation was a hand signed post card (Appendix B, page 143), sent to everyone addressed in the first mailing. It thanked those who had responded and reminded those who had not to do so. This was mailed approximately one week after the first mailing.

Approximately three weeks after the post card reminder, a third "wave" mailing went out, but only to those who had not yet responded. This consisted of a revised cover letter (Appendix B, page 144) composed to persuade those who had not yet responded to do so, together with another copy of the questionnaire with postage paid mail back envelope and post card to send back separately.

Management of the mail outs of each of these "waves" involved several tasks which had to be completed daily from the beginning of the survey until survey

implementation was completed. It was important to closely supervise students working on these mail out tasks to ensure that each task was being done correctly and completed on schedule.

Another critical procedural point for the success of this and similar mail surveys is having an authoritative and responsible individual requesting the information and identified as a point of contact. For the Santa Ana and Wyoming Valley mail surveys, that person was the Chairperson of the Department of Urban Studies and Planning at VCU. She hand signed each of the letters and post cards sent out to each person who had agreed by phone to participate in the mail survey. Her name and phone number were also placed on the cover of the survey booklet, with an invitation for respondents to phone her "collect" if they had any questions. This served to confirm to respondents that the survey was part of a legitimate study, and they could confirm this by telephone at no charge.

CHAPTER VII
RECOMMENDED IMPROVEMENTS

Despite prior pretesting and revision of questionnaires, some things were learned during administration of the face-to-face and mail surveys which should aid in improving questionnaire design for future studies. Some of the problems encountered are discussed below, with specific recommendations for improvement.

IMPLEMENTATION

FACE-TO-FACE

The sampling frame for the Houston survey was a listing of street addresses, most of which did not have names attached. Interviewers initially telephoned sampled residents during the day and attempted to set up a time for a face-to-face interview. This often resulted in either no answers or refusals. The telephone numbers for these phone calls were obtained from Cole's Directory, a directory arranged by street address rather than by name. However, this directory did not include unlisted telephone numbers, nor listings for some outlying areas in the sampling frame. Due to these difficulties, this procedure of preliminary phone contacts to set up the interview was largely discontinued. Residents of most households in the sample were subsequently approached in person, although some residents were still reached by telephone in the evenings.

In place of the initial telephone contacts, a letter (Appendix A, page 93) was sent to all residences within the flooded area (the sampling frame) informing residents of the survey. The letter was mailed on May 4th. As described in the previous

chapter, the letter indicated that a survey would be conducted in the area during May and June, gave three reasons for the importance of the survey, and provided points of contact (with telephone numbers) at the Corps Galveston District Office and the Harris County Flood Control District (the local project sponsor), from whom additional information could be obtained. It also indicated that the Harris County Police Department would verify the identity of the interviewers. The letter was signed by the Acting Director of the Corps Institute for Water Resources.

The letter was very effective, to the point that some people whose neighbors were interviewed were disappointed that they weren't. Many residents receiving the letter were not interviewed, because it was sent to all residences in the sampling frame, not just those selected in the sample. A letter like this should be used in future face-to-face surveys, but it is recommended that it only be mailed to those households selected in the sample.

Some respondents were reluctant to allow interviewers to inventory their household contents or enter all rooms of their home. Some would not allow interviewers to inventory room contents on a second floor of the house. These respondents indicated that since the second floor had not been flooded it was not relevant. These data were needed, however, for determining contents-to-structure ratios and percent damage to total content value. When respondents objected, an alternative to walking through all rooms in the house was for the interviewer to sit with the respondent and have them conduct a mental tour of the house. Residents who object to giving interviewers a tour of their house should be asked to cooperate in this

way. If they refuse because they are pressed for time, the interviewer should offer to come back at a more convenient time to complete the inventory.

MAIL

As previously described, a telephone screening of the Santa Ana and Wyoming Valley samples was conducted to identify sampled household residents willing to complete the more comprehensive mail questionnaire. The proportions agreeing to participate were 57.6 percent and 60.5 percent for the two respective samples. However, despite obtaining this preliminary telephone "commitment," less than 40 percent of the sampled households who agreed to do so actually completed and returned their questionnaires. This was even after the repeated mailings described earlier for the mail-out procedure.

Possible reasons for nonresponse include the amount of detail required and failure by telephone interviewers to fully convey the amount of time it would take to complete the questionnaire. From comments on returned questionnaires and a telephone sampling of non-response, many respondents indicated that when they said they would participate, it was without knowing how much time and effort were required to complete the questionnaire. It is recommended that pre-screening telephone interviewers be instructed to make an attempt to confirm that respondents who agree to participate in the mail survey are sincere in their commitment <u>after</u> being informed of the amount of effort required. However, there may be a trade-off in that this more frank approach might produce more phone refusals.

In some cases, agreement from someone in a residence to participate was obtained by telephone interviewers with a second phone call, which was placed after a person in that residence had previously refused to participate. It is unlikely that such persistence always obtains sincere agreement to participate. It is recommended once a refusal is given by any occupant of a residence, no further attempts should be made to persuade anyone in that residence to participate.

QUESTIONNAIRE MODIFICATION

FACE-TO-FACE

The following comments pertain to the face-to-face questionnaire (Appendix A).

Front Cover: Some respondents were disturbed by the cover sheet (Appendix A, page 95) containing a place for their name and address, when they had been assured by interviewers that their ". . . name will not be associated with your answers." Interviewees should be assured that the cover sheet is only for the survey administrator to verify that the interview has been completed, that the cover sheet will be discarded after data are coded, that names and addresses will not be coded with the data, and that it will therefore be impossible to associate names or addresses with answers during analysis. Keeping cover sheets physically separate from questionnaires, with only sequential identification numbers on the questionnaires, would also help to convince respondents of the confidentiality of their responses.

Question 2: This item was used to determine whether respondents had been flooded by the first, second, or both 1989 floods. This question was somewhat unique to the Houston survey, because two different floods occurred in the area in 1989 approximately two months apart. This item should be omitted in adaptations of this questionnaire for similar face-to-face surveys in which only one flood had taken place during the year. The question worked well for identifying which flood(s) affected residents, but those respondents who reported being flooded both times found it difficult to respond to subsequent questions asking damages for only one of the two floods (the "first" flood experienced). For a survey similar to the Houston case where residences have been flooded two or more times, it is recommended the subsequent questions about damages be repeated with reference to each particular flood.

Question 6: This item referred to the period "just before" the first 1989 flood that affected respondents. Some people interviewed were confused by this and wanted to know how many days "just before" meant. The words "During the 24 hour period" or something similar should be added to the beginning of this question to define an exact time period of reference.

Questions 7 & 15: These items refer to the "first" and "second" messages received just before the first flood that affected respondents. Respondents often became upset with these questions because the listed responses were generally not part of the messages they had received. Messages which were received tended to be more general, referring to heavy rains rather than flooding, and without instructions for specific actions to be taken. An open-ended question inserted before Questions 7 and 15 asking what were the respective first and second messages received should help to relieve respondents' frustration and make them less prone to becoming upset. It would also allow the interviewer to record many of the required answers to components of Questions 7 and 15, without verbally asking for them, based upon what respondents say in their initial open-ended response.

Question 30: This item referred to those who did not evacuate and their decision not to evacuate. This was "somewhat difficult to follow" for some respondents, and difficult for some interviewers to administer; perhaps because two negatives were used in writing the question. Interviewers said that having a blank to check after each response would have made it less confusing for them than having to circle either a "no" or a "yes" as instructed. It is recommended that the question be shortened, omitting the first negative to: "Which of the following affected the decision of you or others in your residence NOT to evacuate?" The "no" or "yes" responses to be circled could then be replaced with an open bracket and instructions to the interviewer to check all that apply.

Question 40: This question was actually a full page of related items. The items refer to specific types of structure damages and measures taken to prevent these damages. As presented in the Houston questionnaire, these items were found confusing by respondents for two reasons: 1) too much specific detail being requested, and 2) a difficult to follow matrix format. With respect to the first reason, there was just too much information requested at one time for respondents (and interviewers) to grasp. Six pieces of information are asked for, on each of eleven lines. Two of these ask for a percentage that each line response is of the eleven line total. This was not needed; it could be calculated during analysis.

With respect to the format problem, a matrix is one of the most difficult formats for respondents to understand. If included in similar future face-to-face surveys, these items should be completely reformatted. It is recommended that each of the eleven lines of items on this question page be converted into four written questions. Following is an example of how line one could be reformatted:

1A. For built-in shelves and appliances:

a) What was the replacement value of damages? $_____

b) How many hours were required to repair or install replacement shelves and appliances, in addition to time paid for in the dollar value of damages given above?

_____HOURS

c) Were any actions taken to prevent these damages?

1 YES 2 NO

d) If yes, what do you estimate was the dollar value of the damage <u>prevented</u> by your actions to prevent damages?

$_____

<u>Questions 46, 47 & 48:</u> These items ask how much damage (to contents) could have been prevented if 3, 6, or 12 hours evacuation notice (respectively) had been received. Most respondents found these questions too difficult to answer, perhaps because they were too hypothetical. They were found to be a problem during the pretest of the questionnaire, but were included because the information was important for the study objectives. Approximately half way through the survey sample, interviewers were instructed to stop asking these questions because of the difficulties encountered. They should not be included in future surveys without additional research and pretesting.

<u>Inventory Items:</u> Many respondents became impatient with the inventory because of the time required to complete it and difficulty in providing the requested dollar values for contents. The only apparent way to address the time issue is to eliminate or combine some of the different items on the inventory sheets so as to shorten them. The trade-off is that less

precise information is obtained and the loss of information and precision may at some point be unacceptable.

Some respondents could not give a "replacement value" for some items, because they felt such items as family mementos could literally not be replaced. Additional research is needed to develop improved value measures for such items.

MAIL

The following comments pertain to the Santa Ana/Wyoming Valley questionnaire (Appendix B).

Questions 7 & 8: The items refer to the square footage of the home and basement, if present. Many respondents either did not provide this requested information or gave numbers that were obviously too small for any normal dwelling. Future surveys should revise these questions to ask for approximate length and width of their dwelling and basement area in feet. Pretesting this revision will show whether or not further revisions are necessary to improve validity of response to these items.

Question 14: Some respondents did not know the market value of their homes, and either noted this or left this question blank. After the question in parentheses are the words "YOUR BEST GUESS." This could be expanded to read "Give your best guess, considering the price of any homes similar to yours recently sold in your neighborhood." A pretest should give an indication of whether or not this change will prompt additional response to this question.

Inventory Items: Some respondents did not completely fill out all inventory pages. Some filled out none, answering only the background questions. Reasons given included the fact that they did not have the time, that it was too much work, and that we were being "too intrusive." Some respondents put question marks on the answer blanks rather than a number. Others grouped items listed on the questionnaire and gave only one value for the entire group. This makes it difficult to attribute the appropriate values to each inventory item when coding the data. A similar problem was encountered in coding the age of content items for some respondents, who gave a range of ages (e.g. 5-10 years old) rather than the exact age. These problems could be addressed in the cover letter. For example, a short paragraph could be added near the end of the letter, but underlined or highlighted so as to draw attention to it. The first sentence could stress confidentiality and the importance for

respondents to provide complete and accurate information for each inventory item. One or more following sentences could specifically ask respondents NOT to group items, giving only one value for them together, and NOT to give ranges of values or ages in place of giving one value or age per item. When making these additions to the cover letter, care should be taken to keep it one page in length. This may require a revision of the complete letter, or, alternatively, only making reference in the letter to an attached page of "special inventory instructions." The instructions on the back of the front cover of the questionnaire should be similarly revised and pretested.

CHAPTER VIII
SUMMARY

This manual was designed as a primer for use by Corps economists, other planners, administrators, and others who must conduct surveys of actual or potential flood damage to residential structures and contents. It is not a completely comprehensive and exhaustive primer. It is limited to residential structures and contents, although many of the survey principles illustrated could also be applied to non-residential property. This primer is also limited to the steps in survey research relating to survey design and implementation; with no reference to assessing, coding, and analyzing survey data, or to writing final reports.

DEFINING OBJECTIVES

It is important that the first step in the study process be a clear and explicit definition of study objectives and data needs. The process of defining study objectives often reveals that a survey is not necessary to obtain the data necessary to address them. Sometimes the desired information may be acquired from local government records or by merely observing relevant properties. Surveys are costly and time consuming and should only be used when necessary. When the decision has been made that a survey is needed, it is usually cost effective to design it so that data are collected to address more than one objective. However, there are trade-offs and limitations to the number of study objectives that can be addressed at one time, relative to the acceptable length and complexity of the survey questionnaire. The

prototype 36 page face-to-face questionnaire displayed in Appendix A approaches the upper limits of tolerable length and complexity.

SELECTING SURVEY METHOD

Selection of the appropriate survey method is usually the next step in the survey process. There are three alternative methods of survey administration that are most often used: face-to-face, telephone, and mail. Each has strengths and weaknesses relative to different survey objectives, constraints, and flood damage situations. In general, face-to-face surveys are best for getting a high response to flood damage surveys. These types of surveys tend to involve long and complex questionnaires. Well trained interviewers can generally obtain larger amounts of complex and sensitive information in face-to-face interviews than would be possible using other survey methods.

The main advantage of telephone surveys is they can usually be implemented relatively quickly. They may be appropriate for addressing some kinds of flood damage objectives where the level of detail and complexity of necessary questions is not great. It is not recommended that telephone surveys be used to address study objectives requiring inventory of household contents.

Mail or telephone surveys (for certain objectives) may be more appropriate than face-to-face when large or dispersed geographic areas must be surveyed. In such cases it is usually not practical or cost effective to send interviewers to every residence selected in the sample.

At the time of selecting the survey method some thought must also be given to how the population to be surveyed will be sampled. This is because mail and telephone surveys usually depend upon the existence of a complete listing of the addresses or telephone numbers of the population to be surveyed. If such a list does not exist, or cannot be created, the possibility of utilizing either of these survey methods is usually precluded.

DESIGNING THE QUESTIONNAIRE

Flood damage questionnaires and other questionnaire items in the Approved Questionnaire Items for Collection of Planning Data (IWR 1984), together with the prototypes in the appendices of this manual, should be used by Corps analysts as a point of departure for questionnaire design. Some redesign of these questionnaires will usually be required to adapt them to the unique conditions of each new flood damage study. Design of some new survey questions within the approved general subject areas might also be needed.

Important considerations for designing survey questionnaires include: question relevance, question reliability and validity, and the overall proper construction of questions and formatting of the questionnaire. To meet the relevance test, all questions in a survey questionnaire must in some way relate to the study objectives. To be judged reliable and valid, questions must consistently measure (reliability) what they are supposed to measure (validity). A number of other principles for proper construction of questions and formatting of the questionnaire, explained in Chapter IV,

must also be simultaneously taken into account when designing any survey questionnaire.

When questions are taken from one type of survey (e.g. face-to-face) and incorporated into questionnaires designed for another method of administration (e.g. mail), changes in format and other revisions are usually necessary. Failure to make these revisions will jeopardize survey results.

Pretesting of the questionnaire is the final phase of questionnaire design and should never be overlooked. Ideally, questionnaires should be first pretested with colleagues (and revised) before pretesting with several respondents who either are from the actual population to be surveyed, or reside in similar residential and flood risk areas. After respondents finish the pretest interview, they should be debriefed to identify all potential problems with the questionnaire. The questionnaire should then be revised and pretested again, until all problems have been corrected. For mail and telephone surveys, the telephone and mail-out procedures should also be pretested to be sure that nothing critical has been overlooked that might jeopardize survey success.

DRAWING A SAMPLE

Usually the population to be surveyed is too large or too dispersed for it to be feasible to collect data from everyone. The population must therefore be sampled and data collected from only those members of the population selected in the sample. The study population is first carefully defined and reduced to a "sampling frame" or listing of population members from which the sample will be drawn. An adequate sample

size is then determined, based upon the levels of precision and confidence desired for final results, as well as minimum numbers of observations needed for statistical procedures which the analyst may plan to use. Samples should be randomly drawn to assure that data collected will represent the study population in all respects. The accuracy of sample estimates of population characteristics which are of particular importance to the study can be improved by stratifying the sample on the basis of those characteristics.

SURVEY IMPLEMENTATION

Careful selection, training, and supervision of survey personnel is critical to successful implementation of any survey effort. This is especially true for face-to-face and telephone interviewers who will be contacting the public. The best persons to select for interviewers are individuals with good interpersonal skills and who are not likely to be perceived as threatening or overbearing to those who are to be interviewed.

An often overlooked aspect of a successful survey is the careful monitoring and concern for detail in implementation of the survey process. Whether its maintaining a survey schedule, reviewing data entry for accuracy and legibility, monitoring "wave" mailings and returns, or any of the myriad other logistical details, poor quality control during survey administration can quickly negate the best efforts in questionnaire design and survey sampling.

FURTHER APPLICATIONS

As stated at the beginning of the present chapter, this manual is not meant to be a completely comprehensive and exhaustive primer. Rather, it illustrates how two different flood damage surveys were conducted, following the steps of the survey process, and provides the questionnaires used in those surveys as prototypes for those who must conduct similar surveys elsewhere.

It is important to emphasize that those who apply all or part of either of these survey prototypes must carefully consider all steps of the survey process within the context of their particular study situation. All studies are unique in some ways, and inadequate attention to any of the steps in the survey process could seriously affect survey results. Corps analysts are encouraged to apply the methodology presented in this manual, but to do so with appropriate adaptations to effectively address the specific study objectives of future applications. In doing so, particular attention should be given to the recommended questionnaire modifications in Chapter VII.

With each additional application lessons are learned that contribute to the knowledge and experience of the individual analyst and to the improvement of the overall survey process. As such prior to implementing any survey effort, contact with individuals with previous experience with appropriate questionnaires or implementation procedures can be a useful source of information to avoid previous mistakes or to identify potential pit falls.

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APPENDIX A

FACE-TO-FACE QUESTIONNAIRE AND INTRODUCTORY LETTERS

TABLE OF CONTENTS

	Page
Preliminary Letter Announcing Survey	93
Interviewer Letter of Introduction	94
Face-to-Face Survey Questionnaire	95

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, WATER RESOURCES SUPPORT CENTER
INSTITUTE FOR WATER RESOURCES
CASEY BUILDING
FORT BELVOIR, VIRGINIA 22060-5586

REPLY TO
ATTENTION OF:

May 4, 1990

CEWRC-IWR-R

Dear Resident:

During the month of May, employees of the U.S. Army Corps of Engineers, Texas A&M University, and Prairie View University will be in your area to conduct a survey regarding flood losses, potential flood loss, and response to flooding that occurred from Cypress Creek and Greens Bayou during May and June of 1989.

We are conducting this survey in cooperation with the Galveston District, Corps of Engineers and the Harris County Flood Control District. Your response to this survey will enable to help us better determine the economic loss of these and other floods, to determine your response to the flood threat, as it occurred and to any flood warning messages you may have heard.

This study will be very important to us in three ways:

1) It will help in the evaluation of the flood control projects that our Galveston District is planning for your area.

2) The increased understanding of flood losses which we get from this survey will help us more accurately determine the benefits of other flood damage reduction projects throughout the United States.

3) It will help the Corps and other agencies plan and evaluate more effective flood warning and preparedness systems.

Should you have any concerns or questions, please contact Mr. Frank Incaprera, Chief of Economics, Galveston District, Corps of Engineers, at 1-800-392-6412, extension 3127 (This is a toll-free call.), or Ms. Markett Ryza, Information Services Manager, Harris County Flood Control District, at 684-4000. Also, the Harris County Police Department is aware of this survey, and can verify the identity of our interviewers. Thank you for your cooperation.

Sincerely,

Kyle E. Schilling
Acting Director

PRELIMINARY LETTER ANNOUNCING SURVEY

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, WATER RESOURCES SUPPORT CENTER
INSTITUTE FOR WATER RESOURCES
CASEY BUILDING
FORT BELVOIR, VIRGINIA 22060-5586

REPLY TO
ATTENTION OF:

CEWRC-IWR-R

Dear Resident:

The purpose of this letter is to introduce Mr. Anthony Greisinger. Mr. Greisinger is employed by the University of Houston and is working for us under an inter-agency agreement. Mr. Greisinger and several Texas A&M employees are conducting interviews in the Cypress Creek and Greens Bayou areas of Harris County. These interviews are being done because of floods that occurred in your area in May and June 1989. We are conducting this survey in cooperation with the Galveston District, U.S. Army Corps of Engineers and the Harris County Flood Control District. Your response to this survey will help us better determine the economic loss of these and other floods and to determine your response to the flood threat as it occurred as well as to any flood warning messages you may have heard.

This study will be very important in three ways:

1) It will help in the evaluation of the flood control projects that Galveston District is planning for your area.

2) The increased understanding of flood losses which we get from this survey will help us more accurately determine the benefits of other flood damage reduction projects throughout the United States.

3) It will help the Corps and other agencies plan and evaluate more effective flood warning and preparedness systems.

Should you have any concerns or questions, please contact Mr. Frank Incaprera, Chief of Economics, Galveston District, Corps of Engineers, at 1-800-392-6412, extension 3127 (This is a toll-free call.), or Ms. Markett Ryza, Information Services Manager, Harris County Flood Control District, at 684-4000. Also, the Harris County Police Department is aware of this survey, and can verify the identity of our interviewers. Thank you for your cooperation.

Sincerely,

Kyle E. Schilling
Acting Director

INTERVIEWER LETTER OF INTRODUCTION

OMB Approval #0710-0001
Expiration Date 11/30/92

U.S. Army Corps of Engineers
Institute for Water Resources and
Galveston District

Residential Flood Survey

The U.S. Army Corps of Engineers is conducting a study of your community to identify possible projects to prevent future flood damage. Your help in discussing how you responded to the recent flood(s) will be greatly appreciated.

Before we get started, I want to assure you that the answers you give will be kept confidential. Your name will not be associated with your answers and your answers will be combined with those we get from everyone else. This interview is voluntary and you are entirely free not to participate or not to answer any of the questions you choose. You are also free to terminate the interview at any time. Are you willing to participate?

Name of interviewee: _____

Address of interviewee: _____

_____

Name of interviewer: _____

Date of interview: _____

Interview number: _____

Survey Number_____
OMB Approval #0710-0001
Expiration Date 11/30/92

FLOOD SURVEY - RESIDENTIAL
U. S. Army Corps of Engineers
Institute for Water Resources

Part I - The Warning Process

Most of the questions in the first part of this survey concern flood watch and flood warning messages you may have received prior to the recent floods in this area. There are no right or wrong answers. Instead, we want to know what you heard and did before and during this flood.

---

1. Were you living at this residence in both May and June of 1989?

   0. NO (If NO, fill-in address :_____)
   1. YES, BOTH MAY AND JUNE
   2. MAY, BUT NOT JUNE
   3. JUNE, BUT NOT MAY

2. In what month or months of 1989 was your residence flooded?

   1. NO MONTHS (If NONE, Only do contents inventory and Marshall & Swift.)
   2. MAY
   3. JUNE
   4. MAY AND JUNE
   5. OTHER MONTHS

3. Before February, what would you have said the chance was of major flooding that would cause an evacuation of your neighborhood? (circle one)

   1. NO CHANCE
   2. SLIGHT CHANCE
   3. MODERATE CHANCE
   4. STRONG CHANCE
   5. EXTREMELY LIKELY CHANCE

4. Before the first flood you experienced this year, had your home ever been flooded? (circle one)

   0. NO **If No, SKIP to Q6**
   1. YES

5. Please give me the year that these previous floodings occurred, and whether or not you evacuated your home each time.

YEAR		
____	0. DID NOT EVACUATE	1. EVACUATED
____	0. DID NOT EVACUATE	1. EVACUATED
____	0. DID NOT EVACUATE	1. EVACUATED

THESE QUESTIONS ONLY APPLY TO THE FIRST FLOOD TO ENTER YOUR HOME IN 1989.

->6. Just before the first flood that affected you in 1989, did anyone at this residence hear from anyone or receive any other communication that flooding was possible? (circle one)

0. NO **If No, SKIP to Q24**
1. YES

7. Did the FIRST such message that you received include any of the following information? [Read list and circle responses.]

a) "Conditions possible for a flood in your community?"	0. NO	1. YES
b) "Watch the river or stream for flooding?"	0. NO	1. YES
c) "It's possible your home will be flooded."	0. NO	1. YES
d) "Flooding will occur; take action?"	0. NO	1. YES
e) "Evacuate your home?" (no instructions)	0. NO	1. YES
f) "Evacuate your home?" (with instructions)	0. NO	1. YES
g) The time that flooding would occur.	0. NO	1. YES
h) Other information in the message.	0. NO	1. YES

(Specify:)_____

8. What would you call this first message that you received? (circle one)

1. A FLOOD WATCH
2. A FLOOD WARNING
3. NEITHER ONE
4. UNSURE

9. On what date and at what time of day did you hear this message?

MO.	DAY	TIME (Hours and Minutes):
__/	__/	__:___ (circle one): AM or PM

10. How did you hear this first message? (circle one only)

1. TV
2. RADIO
3. TELEPHONE BY PUBLIC OFFICIAL
4. TELEPHONE BY OTHER
5. FACE TO FACE BY PUBLIC OFFICIAL
6. FACE TO FACE BY OTHER
7. LOUDSPEAKER
8. SIREN
9. C.B., HAM RADIO or POLICE SCANNER
10. NEWSPAPER
11. OTHER:_____

["Probe" for HOW.]

11. On what date, and at what approximate time did the flood waters reach your block? [Put a Number on each Blank, or Check [ ] if DON'T KNOW]

DATE TIME (Hours and Minutes):

____ __:___ (circle one): AM or PM

12. **I will now read through a list of possible actions to take as a result of hearing a flood watch or warning message. Please answer yes or no to each to indicate the actions that you took, if any, as a result of this first message you heard. Remember, these are only actions with respect to the first message you heard.**

[Read list and circle responses.]

In response to the first message did you :

a) Listen to TV or Radio?	0. NO	1. YES
b) Contact family members?	0. NO	1. YES
c) Contact other people?	0. NO	1. YES
d) Disconnect appliances?	0. NO	1. YES
e) Pack or prepare any household possessions for an evacuation?	0. NO	1. YES
f) Elevate possessions above the floor of the first story of your house, things such as furniture or documents?	0. NO	1. YES
g) Move any possessions to a safer location outside of the house?	0. NO	1. YES
h) Go out and look at the stream?	0. NO	1. YES
i) Move cars or other vehicles to higher ground?	0. NO	1. YES
j) Evacuate from the structure?	0. NO	1. YES
k) Take any other actions? (If yes, list below)	0. NO	1. YES

_____

13. On a scale of 1 to 10 how would you estimate the strength of your belief in this first message? (1 represents ultimate disbelief and 10 represents ultimate belief)

_____ (fill-in with number between 1-10)

14. The previous questions asked about the first message you received. Did you receive a **DIFFERENT MESSAGE LATER ON** indicating that flooding was possible or the possibility of flooding had increased?

0. NO **If No, SKIP to Q 24**
1. YES

15. Did the SECOND message that you received include any of the following information? [Read list and circle responses.]

a) "Conditions possible for a flood in your community?"	0. NO	1. YES
b) "Watch the river or stream for flooding?"	0. NO	1. YES
c) "It's possible your home will be flooded."	0. NO	1. YES
d) "Flooding will occur; take action?"	0. NO	1. YES
e) "Evacuate your home?" (no instructions)	0. NO	1. YES
f) "Evacuate your home?" (with instructions)	0. NO	1. YES
g) The time that flooding would occur.	0. NO	1. YES
h) Other information in the message.	0. NO	1. YES

(Specify:)_____

16. What would you call this SECOND message that you received? (circle one)

1. A FLOOD WATCH
2. A FLOOD WARNING
3. NEITHER ONE
4. UNSURE

17. On what date, and what time of day did you hear this message?

MO.	DAY	TIME (Hours and Minutes):	
__/	__/	__:___	(circle one): AM or PM

18. How did you hear this SECOND message? (circle one only)

1. TV
2. RADIO
3. TELEPHONE BY PUBLIC OFFICIAL
4. TELEPHONE BY OTHER
5. FACE TO FACE BY PUBLIC OFFICIAL
6. FACE TO FACE BY OTHER
7. LOUDSPEAKER
8. SIREN
9. C.B., HAM RADIO or POLICE SCANNER
10. NEWSPAPER
11. OTHER:_____

["Probe" for HOW.]

19. Please answer yes or no to each to indicate which of the following actions, if any, that you took as a result of this SECOND message you heard. [Read list and circle responses.]

In response to the second message did you :

a) Listen to TV or Radio?	0. NO	1. YES
b) Contact family members?	0. NO	1. YES
c) Contact other people?	0. NO	1. YES
d) Disconnect appliances?	0. NO	1. YES
e) Pack or prepare any household possessions for an evacuation?	0. NO	1. YES
f) Elevate possessions above the floor of the first story of your house, things such as furniture or documents?	0. NO	1. YES
g) Move any possessions to a safer location outside of the house?	0. NO	1. YES
h) Go out and look at the stream?	0. NO	1. YES
i) Move cars or other vehicles to higher ground?	0. NO	1. YES
j) Did the SECOND message cause you to evacuate from the structure?	0. NO	1. YES
k) Did the SECOND message cause you to take any other actions? (If yes, list below)	0. NO	1. YES

_____

20. On a scale of 1 to 10 how would you estimate the strength of your belief in this second message?
(1 = ulitmate disbelief, and 10 = ultimate belief)

_____ (fill-in with number between 1-10)

21. After receiving the second message, did you receive any later messages which caused you to take further action?

0. NO **If No, <u>SKIP to Q 24</u>.**
1. YES
2. UNSURE

22. Please describe the (those) later message(s).

_____

_____

23. What additional actions, if any, did you take as a result of hearing the (those) later message(s)?

_____

_____

->24. Do you have any suggestions on ways to improve the current flood warning system?

_____

_____

25. For each of the following categories, please tell me the total number of people who were in the residence, the number who did evacuate, and the number who did not:
[Put a Number or Zero on each Blank]

	TOTAL	EVAC-UATED	DID NOT
a) Household members <u>under</u> 13:	_____	_____	_____
b) Household members 13-64 yrs. old:	_____	_____	_____
c) Household members 65 and over:	_____	_____	_____
d) <u>Non</u>-household members < 13:	_____	_____	_____
e) <u>Non</u>-household members 13-64 yrs. old:	_____	_____	_____
f) <u>Non</u>-household members 65 and over:	_____	_____	_____

26. During the flooding this year, how many people evacuated from your household using each of the following modes of transportation? [Put a Number or Zero on each blank.]
[SKIP to Q 30, if no one evacuated.]

	Number Evacuating
a) CAR OR TRUCK?	_____
b) BOAT?	_____
c) WALKING?	_____
d) OTHER TRANSPORTATION?	_____

(What kind?)_____

27. For you and/or others who decided to evacuate from your residence, which of the following affected the decision to evacuate? Please answer yes or no to each.

Did you evacuate because of:

a) Messages on TV or Radio?	0. NO	1. YES
b) A telephone message from friends or relatives?	0. NO	1. YES
c) A face to face message from friends or relatives?	0. NO	1. YES
d) Telephone messages from local officials?	0. NO	1. YES
e) Face to face messages from local officials?	0. NO	1. YES
f) Experience you or other residents had with floods in previous years?	0. NO	1. YES
g) High stream level or flood waters close to the residence?	0. NO	1. YES
h) Because it was physically impossible to remain in the structure?	0. NO	1. YES
i) To find or meet family members?	0. NO	1. YES
j) Because the neighbors were evacuating?	0. NO	1. YES
k) Other Reason(s) for Decision to Evacuate?	0. NO	1. YES

[Probe for reasons]_____

28. On what date, and at what time of day did you last leave your house to go to a place of safety?

MO. DAY TIME (Hours and Minutes):

__/ __/ __:___ (circle one): AM or PM

29. How much time did it take in your evacuation to get out of the area of flood danger?
[Put a Number or a Zero on each Blank]

_____HOURS; _____MINUTES

Check Box if everyone evacuated [ ], **and SKIP to Q31.**

->30. If you and others did NOT evacuate when warned, which of the following affected your decision NOT to evacuate or to delay doing so? [Read list and circle responses]

a) Did not believe messages on TV or Radio? 0. NO 1. YES

b) A telephone message from friends or relatives? 0. NO 1. YES

c) A face to face message from friends or relatives? 0. NO 1. YES

d) Telephone messages from local officials? 0. NO 1. YES

e) Face to face messages from local officials? 0. NO 1. YES

f) Experience you or other residents had with floods in previous years? 0. NO 1. YES

g) Location of flood waters in relation to the residence? 0. NO 1. YES

h) Because it was physically impossible to leave the structure? 0. NO 1. YES

i) Because of location of family members? 0. NO 1. YES

j) Because the neighbors were not evacuating? 0. NO 1. YES

k) Fear of looting? 0. NO 1. YES

l) Other Reason(s) for Not Evacuating? 0. NO 1. YES

[Probe for Reasons]_____

PART II - COSTS AND DAMAGES

The next group of questions are for the purpose of determining flood damages for different types of properties and possessions. <u>These questions should apply only to the first flood that entered your home in 1989.</u>

[If no one evacuated, skip to Q. 34]

->31. How many days did you or will you spend in temporary residence due to the evacuation or while flood damage to your home is (was) being repaired?

_____DAYS

32. How much money did your household spend, or will you spend, on travel and lodging (including trailer rental or purchase) due to your evacuation(s) this year?

_____DOLLARS

33. Due to the evacuation(s), how much money did your household spend, or will you spend, on food in excess of what you normally would have spent?

_____DOLLARS

->34. How many days of work were lost by all wage earners in this household due to all aspects of this year's flooding?

_____WORK DAYS LOST

35. How many dollars in pay do you estimate were lost by all wage earners in this household this year due to all aspects of this year's flooding?

$ _____WAGES LOST

36. How much was your house worth just before this year's flooding?

$_____

37. At the time of flooding this year . . .

a) How many vehicles were located at this residence?

_____VEHICLES

[If zero, enter above and skip to Q. 38]

b) How many of those vehicles were damaged by the flood?

_____DAMAGED

Check Box if Not Applicable [ ];
If zero enter above and skip to Q. 38

c) What was the total dollar replacement cost to your household for vehicles damaged by the flood?

$_____

d) How much of the total dollar replacement cost for vehicle damage was covered by insurance?

$_____

->38. At the time of flooding, did you have National Flood Insurance coverage?

0. NO 1. YES

39. a) What is the cost of the structural damage to your home?

$_____

[If zero, enter above and skip to Q.40 for estimate of damages prevented.]

b) How much in insurance payments did you or will you receive for this structural damage?

$_____

Check Box if Not Applicable [ ]

REAL ESTATE DAMAGES (fill-in table with $ or % of total when applicable)

40. a) Can you break-down your total real estate damages into the following categories?
    b) Can you also break-down any additional time that was spent on repairs other than paid labor hours?
    c) Did you take any damage prevention measures for these categories?
    d) Can you estimate the value of damages prevented due to these actions?

AREA OF DAMAGE	VALUE OF DAMAGES			PREVENTION MEASURES		
	IN $	IN % OF TOTAL	HOURS TO REPAIR OR INSTALL, IN ADDITION TO $ SPENT	ACTION TAKEN TO PREVENT DAMAGE? (Y/N)	VALUE OF DAMAGE PREVENTED: IN $	IN % OF TOTAL
1. BUILT-IN SHELVES AND APPLIANCES						
2. ELECTRICAL						
3. PLUMBING						
4. EXTERIOR WALLS, WINDOWS, DOORS (PAINTING INCLUDED) AND ROOFING						
5. FOOTINGS AND FOUNDATION						
6. INTERIOR DOORS AND WALLS (PAINTING INCLUDED)						
7. INTERIOR FLOORS, CARPET AND CEILINGS						
8. MECHANICAL SYSTEMS - HEAT, A/C, SUMP PUMP, BUILT-IN VACUUM						
9. OUTBUILDINGS, DECKS, FIREPLACES AND GARAGES						
10. OUTSIDE PROPERTY AND LANDSCAPING						
11. SEPTIC, SEWER AND WATER SYSTEMS						
TOTAL (FROM Q.39 a.)						

41. a) What is the cost of flood damage to the contents of your home?

$_____

b) How much in insurance payments did you or will you receive for that flood damage to your contents?

$_____

Check Box if Not Applicable [ ]

42. How high in feet and inches did the water get relative to the front entryway of your house?

_____FEET; _____INCHES (ABOVE, BELOW) FRONT ENTRYWAY
[circle]

43. For each of the following stories in your house, please give the distance in feet between the floor and the ceiling, and the maximum height in feet above the floor reached by water.

	Have?	Room Height	Feet of Water
a) Basement :	0. NO 1. YES	_____FEET	_____FEET
b) 1st Floor:	0. NO 1. YES	_____FEET	_____FEET
c) 2nd Floor:	0. NO 1. YES	_____FEET	_____FEET
d) 3rd Floor:	0. NO 1. YES	_____FEET	_____FEET

44. How many hours did the waters remain in your residence?

_____HOURS

45. *[If no flood damage prevention measures were taken, skip to Q.46]*

a) How long a time period did the flood damage prevention take?

_____HOURS; _____MINUTES

b) Approximately how many person hours were spent on damage prevention?

_____HOURS

c) How many person hours did it take to put the contents of your house back into their original positions?

_____HOURS

->46. If you had been told to evacuate in THREE hours, how much damage could you have prevented from the flood you experienced this year? Consider preventive measures such as moving things, taking them with you, disconnecting the electricity, or any other measure.

$_____IN DAMAGE

47. If you had been told to evacuate in SIX hours, how much damage could you have prevented from the flood you experienced this year? Consider preventive measures such as moving things, taking them with you, disconnecting the electricity, or any other measure.

$_____IN DAMAGE

48. If you had been told to evacuate in TWELVE hours, how much damage could you have prevented from the flood you experienced this year? Consider preventive measures such as moving things, taking them with you, disconnecting the electricity, or any other measure.

$_____IN DAMAGE

49. What was the monetary cost to you for labor and supplies to clean-up the structure and contents of your house after the flood?

$_____

50. How many total unpaid hours will you and others spend on clean-up for the structure and contents of your house after the flood?

_____HOURS

51. How many total unpaid hours will you and others spend on repair of the contents of your house? (Only Contents; Do not include repairs to the structure of the house)

_____HOURS

52. How much, if anything, did each of the following cost you in actual dollar expenditures as a result of all of the flooding this year?

a) Costs for moving furniture and other belongings? $_____

b) Costs for storing furniture and other belongings? $_____

c) Vandalism, Looting, or Theft Costs? $_____

d) Costs from flooding-related medical problems? $_____

e) Any other costs due to 1989 flooding? $_____

(Specify):_____

Part III: BACKGROUND CHARACTERISTICS

The following background questions are necessary to help us determine the characteristics of different types of potential flood victims, so that warning messages can be more effectively communicated to different residents in the area. We need this information, but you have the right to refuse to answer any questions you would rather not respond to.

53. [*Interviewer: Observe type of structure and CIRCLE below.*]

    1. One Story Structure
    2. One and One Half Story Structure
    3. Two Story Structure
    4. Mobile Home or Trailer
    5. High-Raised Structure (8 Ft. or Higher)
    6. Apartment (Living Quarters on One Level)
    7. Condominium (Living Quarters on 2+ Levels)
    8. Other (Specify)_____

54. Are you the head of this household (the principal wage earner)?

    (**Probe, and Note Gender of Head of Household**)

    0. Male
    1. Female

55. Which of the following racial or ethnic groups best describes the head of this household? (circle one)

    1. American Indian
    2. Black American
    3. Hispanic or Mexican American
    4. Oriental
    5. Caucasian
    6. Other (Specify)_____

56. What is the longest time in years and months that any member of your household has lived in this residence?

    _____YEARS; _____MONTHS

57. At the time of flooding this year, did you own, rent or lease this residence?

    1. OWNED
    2. RENTED or LEASED
    3. OTHER (Specify):_____

58. At the time of flooding this year, what was the marital status of the head of this household?

1. MARRIED
2. SINGLE
3. WIDOWED
4. DIVORCED OR SEPARATED
5. OTHER (Specify):_____

59. At the time of flooding this year, what was the age of the head of this household?

_____YEARS OLD

60. How many total years of schooling have been completed by the principal wage earner of this household?

Grade School	**High School**	**College/Technical**	**Graduate School**
1 2 3 4 5 6 7 8	9 10 11 12	13 14 15 16	17 18 19 20 21+

61. What is your approximate total yearly household income? Include total income before taxes for you and all other members of this household.

1. Less than $10,000
2. $ 10,000 - $ 19,999
3. $ 20,000 - $ 29,999
4. $ 30,000 - $ 39,999
5. $ 40,000 - $ 49,999
6. $ 50,000 - $ 59,999
7. $ 60,000 - $ 69,999
8. $ 70,000 - $ 79,999
9. $ 80,000 - $ 89,999
10. $ 90,000 - $ 99,999
11. $100,000 or more

STRUCTURE AND CONTENTS INVENTORY

Thank you for your cooperation in answering the survey questions. The last thing we would like to do is inventory the structure and furnishings of your house. This information will help the U.S. Army Corps of Engineers to determine the type of flood losses flood victims suffered as a result of the flood and to estimate the value of damages avoided due to damage prevention measures taken. The inventory information is also needed to help the Corps in making decisions for future flood prevention programs. The first portion of this inventory concerns the age and structural composition of your house; the second section consists of an inventory of the contents of your house.

INSTRUCTIONS TO INTERVIEWER FOR CONTENTS INVENTORY: We are attempting to get three major pieces of information from the following contents inventory. These are: the depreciated value of the contents of each house by elevation at the time of the flood (this is to be used to estimate damages with given flood heights), the value of actual damages incurred due to the flood, and an account of the damage prevention measures taken by the residents after receiving a flood warning.

In order to get values for the contents of people's homes, the elevation of each item will be determined. The first step involved with each room of the house is to enter the approximate distance from the entryway to the floor of the room which is to be inventoried. This distance should be similar to the height values obtained from Q. 45 for the various floors of the house. Next, the elevation of each item from the floor of the room should be entered in the first column of the inventory form. This elevation must represent the elevation of the item at the time before the flood hit, not the current elevation or the elevation of the item after damage prevention measures were taken.

The next item of information to be obtained is the value of the contents of each house <u>at the time of the flood</u> by elevation. The type of value we are attempting to get is called "depreciated replacement value." This value is the cost to the owner to replace each item with an item of similar quality and age. In order to simplify this task, we have included two columns on the inventory sheet which, when combined, give an approximation of depreciated replacement cost. These columns are the "age" and the "replacement cost (new)" columns. If the interviewee is unwilling or unable to provide this information, the "suggested replacement cost" columns are to be consulted for estimates of possible replacement values. These estimates are to be used as guidelines for estimating the depreciated replacement prices; if you believe that a particular item, such as an antique, does not fall in the suggested price range, these figures should not be

followed. When the interviewee refuses to estimate a replacement cost, use these columns as a guide to ask the interviewee if one of these estimates sounds to be about right. It is important to note that many of these suggested costs represent the value of one item in cases where there is likely to be more than one item in a room (e.g., the firearms cost range of $230-$600 represents the cost of only one such item, not a gun collection) and a few suggested costs (e.g., books) represent the cost for a collection of such items.

The second major focus for the inventory deals with the value of contents damages from the flood. The "value of damages" column should be filled-in with the interviewee's assessment of damages incurred to each item as a result of the flood. These values should again represent the replacement cost for a similar new item.

Lastly, the inventory is designed to attain information on flood damage prevention measures taken. This information should be entered in the last two columns of the inventory forms. The "action taken to prevent damage" columns should be answered with either a "Y" if a damage prevention measure was taken, or a "N" if no prevention action was taken. The last column on the form is for entering the specific way in which an attempt to prevent damage was undertaken: if the item was elevated, the approximate number of feet that the item was placed relative to the first floor should be entered; if the item was moved out of the structure, a "M" should be placed in that column. This information will later be used to estimate the value of damages prevented.

MARSHALL AND SWIFT RESIDENTIAL ESTIMATOR

GI 1 **Property Owner** _____
GI 2 **Address** _____
GI 3 **City, State, ZIP** _____
GI 4 **Surveyed by** _____
GI 5 **Date of Survey** _____

CO 1 _____ **Type**
1 Single Family
2 Low-rise Multiple
3 Town House, End Unit
4 Town House, Inside Unit
5 Duplex
6 Mobile Home

CO 2 _____ **Zip Code**

CO 3 _____ **Quality**
1 Low
2 Fair
3 Average
4 Good
5 Very Good
6 Excellent

CO 4 _____ **Finished Floor Area**

CO 5 _____ **Effective Age** _____ Year Built

CO 6 _____ **Condition**
1 Worn Out
2 Badly Worn
3 Average
4 Good
5 Very Good
6 Excellent

CO 7 _____ **Style**
1 One-Story
2 Two-Story
3 Three-Story
4 Split-Level
5 1-1/2 Story Finished
6 1-1/2 Story Unfinished
7 2-1/2 Story Finished
8 2-1/2 Story Unfinished
9 3-1/2 Story Finished
10 3-1/2 Story Unfinished
11 Bi-Level

CO 8 _____ **Heating and Cooling**

Heating:
1 Forced Air
2 Gravity Furnace
3 Floor Furnace
4 Wall Furnace
5 Floor, Radiant, Hot Water
6 Ceiling, Radiant, Electric
7 Baseboard, Electric
8 Baseboard, Hot Water
9 Radiators, Hot Water
10 Radiators, Steam

Heating & Cooling:
11 Warmed and Cooled Air
12 Heat Pump System

Cooling only:
13 Evaporative with Ducts
14 Refrigerated with Ducts
15 Refrigerated Window Unit

CO 9 _____ **Exterior Wall**

Wood Frame:
1 Plywood
2 Hardboard Sheets
3 Stucco
4 Siding
5 Shingle
6 Masonry Veneer

Masonry:
7 Common Brick
8 Face Brick
9 Stone
10 Concrete Block

CO10 _____ **Roofing**
1 Composition Shingle
2 Built-up Rock
3 Wood Shingle
4 Wood Shake
5 Concrete Tile
6 Clay Tile
7 Galvanized Metal
8 Slate
9 Composition Roll
10 Plastic Tile

CO11 _____ **Number of Units** (Low-rise Multiples only)

MISCELLANEOUS ITEMS

GARAGE & BASEMENT

GAT _____ SF Attached Garage
GDT _____ SF Detached Garage
GBU _____ SF Built-in Garage
CPT _____ SF Carport (flat roof)
TBA _____ SF Total Bsmt. Area
BMF _____ SF Bsmt. Min. Finish
BPF _____ SF Bsmt. Prtn. Finish

BUILDING

OSP _____ SF Open Slab Porch
SLA _____ SF or % Slab on Ground
PLA _____ SF or % Plaster Interior
SFP _____ Number of Single Fireplaces
DFP _____ Number of Double Fireplaces

GENERAL

LAN _____ Land
SIT _____ Site Improvements
PHY _____ Physical Deprec.
FUN _____ Functional Deprec.
LOC _____ Locational Deprec.

☐ See back for additional miscellaneous items

ADDITIONS AND REMARKS

	Description	Cost	Options
AD1		$	
AD2		$	
AD3		$	
AD4		$	

RE1 _____
RE2 _____

SAVE _____

LIVING ROOM

FLOOR ELEVATION ABOVE/BELOW ENTRANCE: _____ FT.

I.D. NUMBER	ITEM	ELEVATION FROM FLOOR (FEET)	AGE	REPLACEMENT COST (NEW) ($)	SUGGESTED REPLACEMENT COST LOW	MED	HIGH	VALUE OF DAMAGES ($)	ACTION TAKEN TO PREVENT DAMAGE? (Y/N)	IF ELEVATED: NEW ELEVATION (REL.TO ENTRY) OR "M" IF MOVED OUT
101	RUGS				10	60	150			
102	DRAPES/CURTAINS/BLINDS				50	150	300			
103	PICTURES									
104	COUCH/SOFA #1				150	350	900			
	#2									
	#3									
105	CHAIR #1				100	225	495			
	#2									
	#3									
106	LIVING ROOM SUITE									
107	___ TABLES				110	180	300			
108	___ TABLE LAMPS				40	150	260			
109	___ FLOOR LAMPS				70	100	150			
110	TABLE TV				150	275	400			
111	CONSOLE/BIG SCREEN TV				700	1300	2500			
112	VCR/VIDEO TAPES				300	500	1000			
113	BOOKS/BOOKCASE (not built-in)				150	500	1450			
114	CLOCKS				25	65	125			
115	STEREO EQUIPMENT				250	1000	1500			
116	PHONO. RECORDS/COMPACT DISCS				250	300	350			
117	MIRROR									
118	DESK				125	200	350			
119	FAN				15	35	70			
120	AIR CONDITIONER				550	700	800			
121	KNICK-KNACKS									
122	TOYS, VIDEO GAMES EQUIP.				200	450	850			
199	MISCELLANEOUS									

DINING ROOM

FLOOR ELEVATION ABOVE/BELOW ENTRANCE: _____ FT.

I.D. NUMBER	ITEM	ELEVATION FROM FLOOR (FEET)	AGE	REPLACEMENT COST (NEW) ($)	SUGGESTED REPLACEMENT COST LOW	MED	HIGH	VALUE OF DAMAGES ($)	ACTION TAKEN TO PREVENT DAMAGE? (Y/N)	IF ELEVATED: NEW ELEVATION (REL.TO ENTRY) OR "N" IF MOVED OUT
201	RUGS				10	60	150			
202	DRAPES/CURTAINS/BLINDS				50	150	300			
203	PICTURES									
207	___ TABLES				110	180	300			
208	___ TABLE LAMPS				40	150	260			
209	___ FLOOR LAMPS				70	100	150			
214	CLOCKS				25	65	125			
217	MIRROR									
220	AIR CONDITIONER				550	700	800			
221	KNICK-KNACKS									
223	DINING TABLE & CHAIRS				250	550	1200			
224	DINING TABLE									
225	DINING CHAIRS									
226	BUFFET				350	450	550			
227	CHINA CABINET				450	600	750			
228	CHINA				200	350	600			
229	SILVERWARE				150	300	600			
299	MISCELLANEOUS									

DEN

.OOR ELEVATION ABOVE/BELOW ENTRANCE: _____ FT.

I.D. NUMBER	ITEM	ELEVATION FROM FLOOR (FEET)	AGE	REPLACEMENT COST (NEW) ($)	SUGGESTED REPLACEMENT COST LOW	MED	HIGH	VALUE OF DAMAGES ($)	ACTION TAKEN TO PREVENT DAMAGE? (Y/N)	IF ELEVATED: NEW ELEVATION (REL.TO ENTRY) OR "M" IF MOVED OUT
301	RUGS				10	60	150			
302	DRAPES/CURTAINS/BLINDS				50	150	300			
303	PICTURES									
304	COUCH/SOFA #1				150	350	900			
	#2									
305	CHAIR #1				100	225	495			
	#2									
	#3									
307	___ TABLES				110	180	300			
308	___ TABLE LAMPS				40	150	260			
309	___ FLOOR LAMPS				70	100	150			
310	TABLE TV				150	275	400			
311	CONSOLE/BIG SCREEN TV				700	1300	2500			
312	VCR/VIDEO TAPES				300	500	1000			
313	BOOKS/BOOKCASE (not built-in)				150	500	1450			
314	CLOCKS				25	65	125			
315	STEREO EQUIPMENT				250	1000	1500			
316	PHONO. RECORDS/COMPACT DISCS				250	300	350			
317	MIRROR									
318	DESK				125	200	350			
319	FAN				15	35	70			
320	AIR CONDITIONER				550	700	800			
321	KNICK-KNACKS									
322	TOYS, VIDEO GAMES EQUIP.				200	450	850			
330	COMPUTER HARDWARE				500	1500	3000			
331	COMPUTER SOFTWARE				130	430	1000			
332	BAR (not built-in)				330	550	770			
333	SPORTS EQUIPMENT				1000	1200	1500			
334	SEWING MACHINE				160	260	400			
399	MISCELLANEOUS									

HALL & HALL CLOSET(S)

FLOOR ELEVATION ABOVE/BELOW ENTRANCE: _____ FT.

I.D. NUMBER	ITEM	ELEVATION FROM FLOOR (FEET)	AGE	REPLACEMENT COST (NEW) ($)	SUGGESTED REPLACEMENT COST LOW	MED	HIGH	VALUE OF DAMAGES ($)	ACTION TAKEN TO PREVENT DAMAGE? (Y/N)	IF ELEVATED: NEW ELEVATION (REL.TO ENTRY) OR "M" IF MOVED OUT
401	RUGS				10	60	150			
402	DRAPES/CURTAINS/BLINDS				50	150	300			
403	PICTURES									
407	___ TABLES				110	180	300			
408	___ TABLE LAMPS				40	150	260			
413	BOOKS/BOOKCASE (not built-in)				150	500	1450			
414	CLOCKS				25	65	125			
417	MIRROR									
419	FAN				15	35	70			
420	AIR CONDITIONER				550	700	800			
421	KNICK-KNACKS									
422	TOYS, VIDEO GAMES EQUIP.				200	450	850			
433	SPORTS EQUIPMENT				1000	1200	1500			
434	SEWING MACHINE				160	260	400			
435	VACUUM									
436	DRESSER									
437	LUGGAGE				200	350	450			
438	MUSICAL INSTRUMENTS									
439	CLOTHING									
440	TOWELS/LINENS/BLANKETS				300	400	500			
441	FIREARMS				230	400	600			
499	MISCELLANEOUS									

BATH

FLOOR ELEVATION ABOVE/BELOW ENTRANCE: _____ FT.

I.D. NUMBER	ITEM	ELEVATION FROM FLOOR (FEET)	AGE	REPLACEMENT COST (NEW) ($)	SUGGESTED REPLACEMENT COST LOW	MED	HIGH	VALUE OF DAMAGES ($)	ACTION TAKEN TO PREVENT DAMAGE? (Y/N)	IF ELEVATED: NEW ELEVATION (REL.TO ENTRY) OR "M" IF MOVED OUT
501	RUGS				10	60	150			
502	DRAPES/CURTAINS/BLINDS				50	150	300			
503	PICTURES									
514	CLOCKS				25	65	125			
517	MIRROR									
519	FAN				15	35	70			
520	AIR CONDITIONER				550	700	800			
521	KNICK-KNACKS									
540	TOWELS/LINENS/BLANKETS									
542	MEDICINES/SUPPLIES									
599	MISCELLANEOUS									

BATH

FLOOR ELEVATION ABOVE/BELOW ENTRANCE: _____ FT.

I.D. NUMBER	ITEM	ELEVATION FROM FLOOR (FEET)	AGE	REPLACEMENT COST (NEW) ($)	SUGGESTED REPLACEMENT COST			VALUE OF DAMAGES ($)	ACTION TAKEN TO PREVENT DAMAGE? (Y/N)	IF ELEVATED: NEW ELEVATION (REL.TO ENTRY) OR "M" IF MOVED OUT
					LOW	MED	HIGH			
501	RUGS				10	60	150			
502	DRAPES/CURTAINS/BLINDS				50	150	300			
503	PICTURES									
514	CLOCKS				25	65	125			
517	MIRROR									
519	FAN				15	35	70			
520	AIR CONDITIONER				550	700	800			
521	KNICK-KNACKS									
540	TOWELS/LINENS/BLANKETS									
542	MEDICINES/SUPPLIES									
599	MISCELLANEOUS									

BATH

FLOOR ELEVATION ABOVE/BELOW ENTRANCE: _____ FT.

I.D. NUMBER	ITEM	ELEVATION FROM FLOOR (FEET)	AGE	REPLACEMENT COST (NEW) ($)	SUGGESTED REPLACEMENT COST			VALUE OF DAMAGES ($)	ACTION TAKEN TO PREVENT DAMAGE? (Y/N)	IF ELEVATED: NEW ELEVATION (REL.TO ENTRY) OR "M" IF MOVED OUT
					LOW	MED	HIGH			
501	RUGS				10	60	150			
502	DRAPES/CURTAINS/BLINDS				50	150	300			
503	PICTURES									
514	CLOCKS				25	65	125			
517	MIRROR									
519	FAN				15	35	70			
520	AIR CONDITIONER				550	700	800			
521	KNICK-KNACKS									
540	TOWELS/LINENS/BLANKETS									
542	MEDICINES/SUPPLIES									
599	MISCELLANEOUS									

BEDROOM # ___

FLC .EVATION ABOVE/BELOW ENTRANCE: _____ FT.

I.D. NUMBER	ITEM	ELEVATION FROM FLOOR (FEET)	AGE	REPLACEMENT COST (NEW) ($)	SUGGESTED REPLACEMENT COST LOW	MED	HIGH	VALUE OF DAMAGES ($)	ACTION TAKEN TO PREVENT DAMAGE? (Y/N)	IF ELEVATED: NEW ELEVATION (REL.TO ENTRY) OR "M" IF MOVED OUT
601	RUGS				10	60	150			
602	DRAPES/CURTAINS/BLINDS				50	150	300			
603	PICTURES									
605	CHAIR #1				100	225	495			
	#2									
607	___ TABLES				110	180	300			
608	___ TABLE LAMPS				40	150	260			
609	___ FLOOR LAMPS				70	100	150			
610	TABLE TV				150	275	400			
611	CONSOLE/BIG SCREEN TV				700	1300	2500			
612	VCR/VIDEO TAPES				300	500	1000			
613	BOOKS/BOOKCASE (not built-in)				150	500	1450			
614	CLOCKS				25	65	125			
615	STEREO EQUIPMENT				250	1000	1500			
616	PHONO. RECORDS/COMPACT DISCS				250	300	350			
617	MIRROR									
618	DESK				125	200	350			
619	FAN				15	35	70			
620	AIR CONDITIONER				550	700	800			
621	KNICK-KNACKS									
622	TOYS, VIDEO GAMES EQUIP.				200	450	850			
630	COMPUTER HARDWARE				500	1500	3000			
631	COMPUTER SOFTWARE				130	430	1000			
634	SEWING MACHINE				160	260	400			
636	DRESSER #1									
	#2									
639	CLOTHING									
643	BED/MATTRESS				100	300	500			
644	BEDROOM SUITE									
645	RADIO				5	50	110			
648	BEDDING/LINENS				300	400	500			
699	MISCELLANEOUS									

BEDROOM # ___

FLOOR ELEVATION ABOVE/BELOW ENTRANCE: _____ FT.

I.D. NUMBER	ITEM	ELEVATION FROM FLOOR (FEET)	AGE	REPLACEMENT COST (NEW) ($)	SUGGESTED REPLACEMENT COST LOW	MED	HIGH	VALUE OF DAMAGES ($)	ACTION TAKEN TO PREVENT DAMAGE? (Y/N)	IF ELEVATED: NEW ELEVATION (REL.TO ENTRY) OR "M" IF MOVED OUT
601	RUGS				10	60	150			
602	DRAPES/CURTAINS/BLINDS				50	150	300			
603	PICTURES									
605	CHAIR #1				100	225	495			
	#2									
607	___ TABLES				110	180	300			
608	___ TABLE LAMPS				40	150	260			
609	___ FLOOR LAMPS				70	100	150			
610	TABLE TV				150	275	400			
611	CONSOLE/BIG SCREEN TV				700	1300	2500			
612	VCR/VIDEO TAPES				300	500	1000			
613	BOOKS/BOOKCASE (not built-in)				150	500	1450			
614	CLOCKS				25	65	125			
615	STEREO EQUIPMENT				250	1000	1500			
616	PHONO. RECORDS/COMPACT DISCS				250	300	350			
617	MIRROR									
618	DESK				125	200	350			
619	FAN				15	35	70			
620	AIR CONDITIONER				550	700	800			
621	KNICK-KNACKS									
622	TOYS, VIDEO GAMES EQUIP.				200	450	850			
630	COMPUTER HARDWARE				500	1500	3000			
631	COMPUTER SOFTWARE				130	430	1000			
634	SEWING MACHINE				160	260	400			
636	DRESSER #1									
	#2									
639	CLOTHING									
643	BED/MATTRESS				100	300	500			
644	BEDROOM SUITE									
645	RADIO				15	50	110			
646	BEDDING/LINENS				300	400	500			
699	MISCELLANEOUS									

BEDROOM # ___

FLOOR ELEVATION ABOVE/BELOW ENTRANCE: _____ FT.

I.D. NUMBER	ITEM	ELEVATION FROM FLOOR (FEET)	AGE	REPLACEMENT COST (NEW) ($)	SUGGESTED REPLACEMENT COST LOW	MED	HIGH	VALUE OF DAMAGES ($)	ACTION TAKEN TO PREVENT DAMAGE? (Y/N)	IF ELEVATED: NEW ELEVATION (REL.TO ENTRY) OR "M" IF MOVED OUT
601	RUGS				10	60	150			
602	DRAPES/CURTAINS/BLINDS				50	150	300			
603	PICTURES									
605	CHAIR #1				100	225	495			
	#2									
607	___ TABLES				110	180	300			
608	___ TABLE LAMPS				40	150	260			
609	___ FLOOR LAMPS				70	100	150			
610	TABLE TV				150	275	400			
611	CONSOLE/BIG SCREEN TV				700	1300	2500			
612	VCR/VIDEO TAPES				300	500	1000			
613	BOOKS/BOOKCASE (not built-in)				150	500	1450			
614	CLOCKS				25	65	125			
615	STEREO EQUIPMENT				250	1000	1500			
616	PHONO. RECORDS/COMPACT DISCS				250	300	350			
617	MIRROR									
618	DESK				125	200	350			
619	FAN				15	35	70			
620	AIR CONDITIONER				550	700	800			
621	KNICK-KNACKS									
622	TOYS, VIDEO GAMES EQUIP.				200	450	850			
630	COMPUTER HARDWARE				500	1500	3000			
631	COMPUTER SOFTWARE				130	430	1000			
634	SEWING MACHINE				160	260	400			
636	DRESSER #1									
	#2									
639	CLOTHING									
643	BED/MATTRESS				100	300	500			
644	BEDROOM SUITE									
645	RADIO				15	50	110			
646	BEDDING/LINENS				300	400	500			
699	MISCELLANEOUS									

BEDROOM # ___

FLOOR ELEVATION ABOVE/BELOW ENTRANCE: _____ FT.

I.D. NUMBER	ITEM	ELEVATION FROM FLOOR (FEET)	AGE	REPLACEMENT COST (NEW) ($)	SUGGESTED REPLACEMENT COST LOW	MED	HIGH	VALUE OF DAMAGES ($)	ACTION TAKEN TO PREVENT DAMAGE? (Y/N)	IF ELEVATED: NEW ELEVATION (REL.TO ENTRY) OR "M" IF MOVED OUT
601	RUGS				10	60	150			
602	DRAPES/CURTAINS/BLINDS				50	150	300			
603	PICTURES									
605	CHAIR #1				100	225	495			
	#2									
607	___ TABLES				110	180	300			
608	___ TABLE LAMPS				40	150	260			
609	___ FLOOR LAMPS				70	100	150			
610	TABLE TV				150	275	400			
611	CONSOLE/BIG SCREEN TV				700	1300	2500			
612	VCR/VIDEO TAPES				300	500	1000			
613	BOOKS/BOOKCASE (not built-in)				150	500	1450			
614	CLOCKS				25	65	125			
615	STEREO EQUIPMENT				250	1000	1500			
616	PHONO. RECORDS/COMPACT DISCS				250	300	350			
617	MIRROR									
618	DESK				125	200	350			
619	FAN				15	35	70			
620	AIR CONDITIONER				550	700	800			
621	KNICK-KNACKS									
622	TOYS, VIDEO GAMES EQUIP.				200	450	850			
630	COMPUTER HARDWARE				500	1500	3000			
631	COMPUTER SOFTWARE				130	430	1000			
634	SEWING MACHINE				160	260	400			
636	DRESSER #1									
	#2									
639	CLOTHING									
643	BED/MATTRESS				100	300	500			
644	BEDROOM SUITE									
645	RADIO				15	50	110			
646	BEDDING/LINENS				300	400	500			
699	MISCELLANEOUS									

KITCHEN

FLOOR ELEVATION ABOVE/BELOW ENTRANCE: _____ FT.

I.D. NUMBER	ITEM	ELEVATION FROM FLOOR (FEET)	AGE	REPLACEMENT COST (NEW) ($)	SUGGESTED REPLACEMENT COST LOW	MED	HIGH	VALUE OF DAMAGES ($)	ACTION TAKEN TO PREVENT DAMAGE? (Y/N)	IF ELEVATED: NEW ELEVATION (REL.TO ENTRY) OR "M" IF MOVED OUT
701	RUGS				10	60	150			
702	DRAPES/CURTAINS/BLINDS				50	150	300			
703	PICTURES									
705	___ CHAIRS									
707	___ TABLES				110	180	300			
708	___ TABLE LAMPS				40	150	260			
709	___ FLOOR LAMPS				70	100	150			
714	CLOCKS				25	65	125			
720	AIR CONDITIONER				550	700	800			
721	KNICK-KNACKS									
729	SILVERWARE				150	300	600			
730	TV				150	275	400			
747	KITCHEN TABLE & CHAIRS				450	550	650			
748	KITCHEN TABLE									
749	DEEPFREEZE									
750	DISHWASHER (portable only)				475	600	750			
751	COOKING UTENSILS									
752	TOASTER									
753	DEEPFRYER									
754	COFFEE MAKER									
755	MIXER									
756	BLENDER									
757	DISHES									
758	FOODSTUFFS				250	600	1000			
759	FOOD PROCESSOR				154	175	193			
760	MICROWAVE (not built-in)				246	400	760			
761	COOKWARE				100	175	250			
762	RANGE/OVEN (not built-in)				385	600	1200			
763	REFRIGERATOR (not built-in)				583	737	979			
799	MISCELLANEOUS									

LAUNDRY-UTILITY ROOM

FLOOR ELEVATION ABOVE/BELOW ENTRANCE: _____ FT.

I.D. NUMBER	ITEM	ELEVATION FROM FLOOR (FEET)	AGE	REPLACEMENT COST (NEW) ($)	SUGGESTED REPLACEMENT COST			VALUE OF DAMAGES ($)	ACTION TAKEN TO PREVENT DAMAGE? (Y/N)	IF ELEVATED: NEW ELEVATION (REL.TO ENTRY) OR "M" IF MOVED OUT
					LOW	MED	HIGH			
801	RUGS				10	60	150			
802	DRAPES/CURTAINS/BLINDS				50	150	300			
805	CHAIR #1									
	#2									
807	___ TABLES				110	180	300			
808	___ TABLE LAMPS				40	150	260			
809	___ FLOOR LAMPS				70	100	150			
819	FAN				15	35	70			
820	AIR CONDITIONER				550	700	800			
833	SPORTS EQUIPMENT				1000	1200	1500			
834	SEWING MACHINE				160	260	400			
835	VACUUM									
851	DEEPFREEZER									
864	LAUNDRY SUPPLIES									
865	CLOTHES WASHER									
866	CLOTHES DRYER									
899	MISCELLANEOUS									

GARAGE

FLOOR ELEVATION ABOVE/BELOW ENTRANCE: _____ FT.

I.D. NUMBER	ITEM	ELEVATION FROM FLOOR (FEET)	AGE	REPLACEMENT COST (NEW) ($)	SUGGESTED REPLACEMENT COST LOW	MED	HIGH	VALUE OF DAMAGES ($)	ACTION TAKEN TO PREVENT DAMAGE? (Y/N)	IF ELEVATED: NEW ELEVATION (REL.TO ENTRY) OR "M" IF MOVED OUT
919	FAN				15	35	70			
933	SPORTS EQUIPMENT				1000	1200	1500			
941	FIREARMS				230	400	600			
951	DEEPFREEZER									
964	LAUNDRY SUPPLIES									
965	CLOTHES WASHER									
966	CLOTHES DRYER									
967	LAWNMOWER				165	325	2420			
968	EDGER/TRIMMER									
969	GARDER TILLER									
970	FISHING EQUIP.				50	125	200			
971	CAMP EQUIPMENT				150	300	500			
972	CHAIN SAW				83	200	440			
973	DRILL									
974	SANDER									
975	LATHE									
976	OTHER POWER TOOLS									
977	BICYCLES				110	300	600			
978	LAWN FURNITURE									
979	CAR/TRUCK #1									
	#2									
999	MISCELLANEOUS									

BASEMENT - FINISHED OR UNFINISHED (circle one)

FLOOR ELEVATION ABOVE/BELOW ENTRANCE: _____ FT.

I.D. NUMBER	ITEM	ELEVATION FROM FLOOR (FEET)	AGE	REPLACEMENT COST (NEW) ($)	SUGGESTED REPLACEMENT COST LOW	MED	HIGH	VALUE OF DAMAGES ($)	ACTION TAKEN TO PREVENT DAMAGE? (Y/N)	IF ELEVATED: NEW ELEVATION (REL.TO ENTRY) OR "M" IF MOVED OUT
1001	RUGS				10	60	150			
1003	PICTURES									
1004	COUCH/SOFA #1				150	350	900			
	#2									
1005	CHAIR #1				100	225	495			
	#2									
	#3									
1007	___ TABLES				110	180	300			
1008	___ TABLE LAMPS				40	150	260			
1009	___ FLOOR LAMPS				70	100	150			
1010	TABLE TV				150	275	400			
1011	CONSOLE TV				700	1300	2500			
1012	VCR/VIDEO TAPES				300	500	1000			
1013	BOOKS/BOOKCASE (not built-in)				150	500	1450			
1014	CLOCKS				25	65	125			
1015	STEREO EQUIPMENT				250	1000	1500			
1016	PHONO. RECORDS/COMPACT DISCS				250	300	350			
1017	MIRROR									
1018	DESK				125	200	350			
1019	FAN				15	35	70			
1020	AIR CONDITIONER				550	700	800			
1021	KNICK-KNACKS									
1022	TOYS, VIDEO GAMES EQUIP.				200	450	850			
1030	COMPUTER HARDWARE				500	1500	3000			
1031	COMPUTER SOFTWARE				130	430	1000			
1032	BAR (not built-in)				330	550	770			
1033	SPORTS EQUIPMENT				1000	1200	1500			
1034	SEWING MACHINE				160	260	400			
1041	FIREARMS				230	400	600			
1051	DEEPFREEZER									
1064	LAUNDRY SUPPLIES									
1065	CLOTHES WASHER									
1066	CLOTHES DRYER									
1067	LAWNMOWER				165	325	2420			
1068	EDGER/TRIMMER									
1069	GARDER TILLER									

BASEMENT - (cont'd.)

I.D. NUMBER	ITEM	ELEVATION FROM FLOOR (FEET)	AGE	REPLACEMENT COST (NEW) ($)	SUGGESTED REPLACEMENT COST			VALUE OF DAMAGES ($)	ACTION TAKEN TO PREVENT DAMAGE? (Y/N)	IF ELEVATED: NEW ELEVATION (REL.TO ENTRY) OR "M" IF MOVED OUT
					LOW	MED	HIGH			
1070	FISHING EQUIP.				50	125	200			
1071	CAMP EQUIPMENT				150	300	500			
1072	CHAIN SAW				83	200	440			
1073	DRILL									
1074	SANDER									
1075	LATHE									
1076	OTHER POWER TOOLS									
1077	BICYCLES				110	300	600			
1078	LAWN FURNITURE									
1099	MISCELLANEOUS									

PORCH/ITEMS OUTSIDE OF STRUCTURE

FLOOR ELEVATION ABOVE/BELOW ENTRANCE: _____ FT.

I.D. NUMBER	ITEM	ELEVATION FROM FLOOR (FEET)	AGE	REPLACEMENT COST (NEW) ($)	SUGGESTED REPLACEMENT COST LOW	MED	HIGH	VALUE OF DAMAGES ($)	ACTION TAKEN TO PREVENT DAMAGE? (Y/N)	IF ELEVATED: NEW ELEVATION (REL.TO ENTRY) OR "M" IF MOVED OUT
1104	COUCH/SOFA #1				150	350	900			
1105	CHAIR #1				20	65	100			
	#2									
	#3									
1107	___ TABLES				110	180	300			
1121	KNICK-KNACKS									
1133	SPORTS EQUIPMENT				1000	1200	1500			
1151	DEEPFREEZER									
1167	LAWNMOWER				165	325	2420			
1168	EDGER/TRIMMER									
1169	GARDER TILLER									
1170	FISHING EQUIP.				50	125	200			
1171	CAMP EQUIPMENT				150	300	500			
1172	CHAIN SAW				83	200	440			
1173	DRILL									
1174	SANDER									
1175	LATHE									
1176	OTHER POWER TOOLS									
1177	BICYCLES				110	300	600			
1178	LAWN FURNITURE									
1179	GRILL				100	180	240			
1180	PLANTS & POTS									
1181	SWING				90	120	150			
1182	BOAT									
1183	CAR/TRUCK #1									
1184	#2									
1185	LIVESTOCK									
1186	MOTOR HOME									
1187	MOTORCYCLE #1									
1188	#2									
1189	SHED (PORTABLE)									
1199	MISCELLANEOUS									

APPENDIX B

TELEPHONE SURVEY SCRIPT, MAIL QUESTIONNAIRE, AND COVER LETTERS

TABLE OF CONTENTS

	Page
Telephone Survey Script	137
Initial Cover Letter	141
Post Card to be Returned at Same Time as Questionnaire	142
Post Card Reminder	143
Second Cover Letter	144
Mail Questionnaire	145

NOTE: The following script was used in a computerized telephone survey, in which questions appeared on a computer screen in front of the interviewer while talking to the respondent on the telephone. Answers to the telephone questions were recorded by the interviewer by typing the appropriate number from numbers placed to the left of the question responses.

The Computer Assisted Telephone Interview (CATI) software system was used to program the actual telephone script. The programmed question routines were somewhat less complicated than the two pages of telephone script shown here. In this two page illustration, lines are drawn to show different sequences of text read to the respondents, depending upon how they answer each question. These question sequences appeared automatically on the computer screen during the telephone interviewing. The text read by the interviewers is shown within quotation marks, but they were allowed to paraphrase this and did not always verbalize everything exactly as it appears. They were also given some supplementary phrases to use with respondents, if needed. For example, respondents concerned about the legitimacy of the survey were given a County official's name and telephone number to call so they could confirm that the study being conducted was legitimate.

"Hello, I'm (Name of Interviewer) calling from Virginia Commonwealth University in Richmond Virginia for our Department of Urban Studies and Planning." Is this (Phone Number) in Area Code ____?"

1 Yes - possible household
2 No - first contact with a wrong phone number
3 No - second contact with a wrong phone number
4 Answering service - possible residence

"Have I reached you at your home phone?"

1 Yes
No - SAY: "Thank you for your time"
Then hang up and record type below, if possible.

5 Business, Commercial, Pay, or Mobile Phone
6 Group Quarters, Institution
7 Other Non-Household

"We are conducting a study for the U.S. Army Corps of Engineers in cooperation with (Luzerne, PA) or (Orange, CA) County. Are you 18 years of age or older?"

1 Yes
2 No....[GO TO TOP OF NEXT PAGE]

READ: "The information gathered will be used in determining flood protection programs, such as the one proposed by the (Project Name). Your participation is extremely important because you were selected as part of a scientific sample of residents in the area. All information that is gathered is being kept strictly confidential.

If you participate you will be mailed a questionnaire requesting information on your household contents. The questionnaire is designed so that you may keep a copy of the information. This record of your possessions will be very helpful if you ever have a loss of property from flood, earthquake, fire or some other disaster.

The questionnaire takes a fair amount of time to fill out, but we sincerely need your help in providing the necessary information for our study. Your participation is voluntary, and you may refuse to give any or all of the requested information. Are you willing to participate in this mail survey?"

1 Yes - SAY: "Thank you for your time"
Then hang up and record any problems.
2 No - SAY: "Thank you for your time"
Hang up and record reason, if possible.

TELEPHONE SURVEY SCRIPT

"May I speak to someone 18 years of age or older who lives there?"

1 Adult comes to phone
2 Adult not home, cannot come to phone now [CALL BACK LATER]
3 No one 18 or older in household

"May I speak to someone 16 or 17 years of age who lives there?"

1 Yes, is on phone already [READ BOX PREVIOUS PAGE]
2 Yes, comes to phone
3 Is not home now or cannot come to phone [CALL BACK LATER]

4 No one 16 or older lives there [TERMINATE INTERVIEW]

READ: - "Hello, I'm (Name of Interviewer) calling from Virginia Commonwealth University in Richmond Virginia for our Department of Urban Studies and Planning. We are conducting a study for the U.S. Army Corps of Engineers in cooperation with (Luzerne, PA) or (Orange, CA) County. The information gathered will be used in determining flood protection programs, such as the one proposed by the (Project Name). Your participation is extremely important because you were selected as part of a scientific sample of residents in the area. All information that is gathered is being kept strictly confidential.

If you participate you will be mailed a questionnaire requesting information on your household contents. The questionnaire is designed so that you may keep a copy of the information. This record of your possessions will be very helpful if you ever have a loss of property from flood, earthquake, fire, or some other disaster.

The questionnaire takes a fair amount of time to fill out, but we sincerely need your help in providing the necessary information for our study. Your participation is voluntary, and you may refuse to give any or all of the requested information. Are you willing to participate in this mail survey?"

1 Yes - SAY: "Thank you for your time"
Then hang up and record any problems.
2 No - SAY: "Thank you for your time"
Hang up and record reason, if possible.

TELEPHONE SURVEY SCRIPT

Virginia Commonwealth University

72415

July 3, 1990

Respondent's Name
Street Address
Garden Grove, California 92401

Dear Respondent's Name

Recently, you agreed over the phone to assist us with our research on the value of homes and their contents. Your participation is extremely important because you were selected as a member of a scientifically drawn sample of residents in the area. Results of this study will be used in determining the economic efficiency of plans for the Santa Ana Flood Control Project and similar projects throughout the United States. You may confirm the importance of our study and your participation by contacting Terrie Medeiros, Project Manager for the Lower Santa Ana River Flood Control Project, Orange County Environmental Management Agency in Santa Ana at 714-834-3388.

The enclosed booklet questionnaire requests the information described to you over the telephone. It is designed so that you may keep a copy of the information on the value of your household items. You may need this in case you ever have a loss from fire, flood, earthquake or other disasters. Countless millions are lost each year by homeowners and renters who do not prepare proper claims for losses. Insurance claims based on memory are usually faulty and result in less money being recovered. Factual claims backed-up by a written record are more accurate and should result in a larger recovery of your loss.

Please take the time necessary to fill out the information requested for each room in your residence. I do not expect you to have every item, but please fill it out the best you can. Then complete the background information questions at the end of the booklet. Move the tagboard separator to behind the yellow sheet as you write so that your marks will not show through on every page, just on the appropriate one. After you have completed the questionnaire, tear out the yellow sheets on the perforated line and put them in a safe place outside your home. Then please mail the booklet back to us in the enclosed self-addressed stamped envelope.

I can assure you that all of the information you furnish us will be kept strictly confidential. Neither your name nor address will be placed on the questionnaire booklet. We have enclosed a postcard for you to return separately from the questionnaire so that we can know that you have mailed the questionnaire back. Please mail both the questionnaire and the postcard in order to avoid us sending you a second questionnaire. Information from all questionnaires received back will combined for analysis, and the results will be reported as group statistics for your area.

As director of this project, I want to thank you for your time and effort. It is through the help that you and others give that we can improve public policy and make government more efficient. If you have any questions about filling out this questionnaire please call me at 804-367-1134 between 9 a.m. and 5 p.m. Eastern Daylight Time. Thank you for your help.

Sincerely,

Margot W. Garcia

Margot W. Garcia, PhD, AICP
Project Director

INITIAL COVER LETTER

I mailed the completed survey booklet on _____

Date

_____

Signature

❑ Check here if you would like an Executive Summary of our findings.

POST CARD TO BE RETURNED AT SAME TIME AS QUESTIONNAIRE

Dear Resident:

Last week you were mailed a questionnaire, designed to provide us with information on the value of residential buidlings and their contents. This information is needed by Virginia Commonwealth University to assist in the Corps of Engineers' flood damage prevention efforts.

I am writing now to encourage you to complete the questionnaire at your earliest convenience. Information related to your home is vital, if we are to successfully complete this study.

If you have already completed and mailed the questionnaire, please accept our thanks. Your efforts are greatly appreciated.

Sincerely,

Margot Garcia, Project Director

P.S. If you did not receive a questionnaire, please call us collect at (804) 367-1134 between 9 am and 5 pm Eastern Daylight Savings time.

POST CARD REMINDER

Virginia Commonwealth University

71195

July 5, 1990

Respondent's Name
Street Address
Orange, California 92665

Dear Respondent's Name

About a month ago you agreed over the phone to assist us with our research on the value of homes and their contents and we sent you a questionnaire and follow-up postcard. We have not yet received your filled in questionnaire, or if you sent us your questionnaire, we did not receive the postcard which told us it had been mailed. Your participation is extremely important because you were selected as a member of a scientifically drawn sample of residents in the area. With all the news of the floods this spring you can understand the importance of flood control programs.

Enclosed is another copy of the questionnaire. Please take the time necessary to fill out the information requested for each room in your residence. I do not expect you to have every item, but please fill it out the best you can. Then complete the background information questions at the end of the booklet. Move the tagboard separator to behind the yellow sheet as you write so that your marks will not show through on every page, just the appropriate one. After you have completed the questionnaire, tear out the yellow sheets and put them in a safe place outside your home. Then please mail the booklet back to us in the enclosed self-addressed stamped envelope and also mail the postcard enclosed in the packet so we will know that you have completed the survey.

I can assure you that Neither your name nor address will be placed on the questionnaire booklet. Information from all questionnaires received back will be combined for analysis and the results will be reported as group statistics for your area. The results of this study will be used in determining the economic efficiency of plans for the Corps of Engineer' s Santa Ana Flood Control Project and similar projects throughout the United States. You may confirm the importance of our study and your participation by contacting Terrie Mederios, Project Manager for the Lower Santa Ana River Flood Control Project, Orange County Environmental Management Agency in Santa Ana at 714-834-3388.

As director of this project, I want to thank you for your time and effort. Citizens often complain they have no way to influence governmental actions. You can take pride in the fact that by filling out this questionnaire you are helping us make government more efficient. If you have any questions about filling out this questionnaire, please call me collect at 804-367-1134 between 9 a.m. and 5 p.m. Eastern Daylight time. Again, thank you very much for your help.

Sincerely,

Margot W. Garcia

Margot W. Garcia, PhD, AICP
Project Director

SECOND COVER LETTER

NOTE: The mail questionnaire depicted on pages 147-165 was printed and collated in booklet form. Glossy card stock was used for the front and back covers. As described in Chapter VI, three different colors of card stock were used for the covers, so that returned questionnaires could be easily identified by the flood risk zone in which the sampled residences were located. Instructions for completing the inventory (page 148) were printed on the inside of the front cover so that they would be immediately opposite the first inventory page. The inventory forms (pages 149-160) were printed on two-part carbonless paper, and, as such, were not collated front-to-back as depicted in this appendix. The first (original) page of each inventory form was printed on white paper, and the carbonless copy was yellow. The copy also contained a statement (see page 150) identifying that page as the respondent's personal copy. The pages were perforated so that the copy could be easily torn out of the booklet and retained by the respondent. The "Background Questions" (pages 161-164) were printed front-to-back, on white paper. In addition to the questionnaire booklet, a tagboard separator (page 146) was included in the mailing with instructions for its use when completing the inventory forms.

OMB Approval #0702-0116
Expiration Date: 10/31/92

Home Contents Value Survey

Virginia Commonwealth University
U.S. Army Corps of Engineers

Thank you for your help by filling out this questionnaire. If you have any questions please phone collect (804) 367-1134 between 9 a.m. and 5 p.m. Eastern Daylight Time.

Please return this questionnaire in the enclosed, postage paid envelope to:

Dr. Margot W. Garcia
Department of Urban Studies and Planning
Virginia Commonwealth University
812 W. Franklin Street
Richmond, Virginia
23284-2008

INVENTORY INSTRUCTIONS:

Most pages of this questionnaire are designed for you to do a thorough inventory of the contents of your home. Contents are items within your home which are not permanently attached to the building.

The simplest way for you to complete this inventory is to walk through the room to which each page applies. For each type of item listed on a page:

(1)	AND EITHER (2)	OR (3)	
Indicate how many pieces of each item there are in the room(s) to which the page applies.	Indicate total current cash value for each item.	Indicate total original costs when purchased, for each type of item. If you obtained an item as a gift or if you inherited it, enter total cash value you think it was worth at the time.	Indicate the number of years ago that you obtained each item. If you obtained more than one of the item over the years, estimate the average number of years ago that you obtained the items.

The information you provide does not have to be absolutely precise. If in doubt, make your best guess. Be sure to fill out each page which lists items found in your house. Most types of items will be listed on only one page. If an item you own is listed on a room page different from the room where the item is found in your house, put the value and number of years owned for the item on that page.

After you complete the inventory sheets, please answer the final background questions and mail back our questionnaire. DON'T FORGET TO TEAR OUT THE YELLOW COPIES TO KEEP WITH YOUR INSURANCE RECORDS.

Your participation in this survey is voluntary and you may refuse to give any or all of the requested information.

LIVING ROOM

For All such items, please give:
1) the total number of pieces,
AND EITHER
2) the total current cash value,
OR
3) the original purchase cost, and average number of years owned.

(1) Total No. of Pieces		(2) Total Current Cash Value	(3) Total Original Purchase Costs	Average Number of Years Ago Items Obtained
_____	Unattached Bookcases	$_____	$_____	____Years Ago
_____	Books	$_____	$_____	____Years Ago
_____	Couches/Sofas	$_____	$_____	____Years Ago
_____	Chairs	$_____	$_____	____Years Ago
_____	Tables	$_____	$_____	____Years Ago
_____	Lamps	$_____	$_____	____Years Ago
_____	Curtains/Drapes/Blinds	$_____	$_____	____Years Ago
_____	Unattached Carpets/Rugs	$_____	$_____	____Years Ago
_____	Stereo Equipment	$_____	$_____	____Years Ago
_____	Records/CDs/Cassettes	$_____	$_____	____Years Ago
_____	Television Sets	$_____	$_____	____Years Ago
_____	VCR Equipment	$_____	$_____	____Years Ago
_____	Video Tapes	$_____	$_____	____Years Ago
_____	Pictures	$_____	$_____	____Years Ago
_____	Antiques	$_____	$_____	____Years Ago
_____	Pianos	$_____	$_____	____Years Ago
_____	Other	$_____	$_____	____Years Ago
_____	.....	$_____	$_____	____Years Ago
_____	.....	$_____	$_____	____Years Ago
_____	.....	$_____	$_____	____Years Ago

LIVING ROOM

For All such items, please give:
1) the total number of pieces,
AND EITHER
2) the total current cash value,
OR
3) the original purchase cost, and average number of years owned.

(1) Total No. of Pieces		(2) Total Current Cash Value	(3) Total Original Purchase Costs	Average Number of Years Ago Items Obtained
____	Unattached Bookcases	$____	$____	____Years Ago
____	Books	$____	$____	____Years Ago
____	Couches/Sofas	$____	$____	____Years Ago
____	Chairs	$____	$____	____Years Ago
____	Tables	$____	$____	____Years Ago
____	Lamps	$____	$____	____Years Ago
____	Curtains/Drapes/Blinds	$____	$____	____Years Ago
____	Unattached Carpets/Rugs	$____	$____	____Years Ago
____	Stereo Equipment	$____	$____	____Years Ago
____	Records/CDs/Cassettes	$____	$____	____Years Ago
____	Television Sets	$____	$____	____Years Ago
____	VCR Equipment	$____	$____	____Years Ago
____	Video Tapes	$____	$____	____Years Ago
____	Pictures	$____	$____	____Years Ago
____	Antiques	$____	$____	____Years Ago
____	Pianos	$____	$____	____Years Ago
____	Other	$____	$____	____Years Ago
____		$____	$____	____Years Ago
____		$____	$____	____Years Ago
____		$____	$____	____Years Ago

Your Personal Copy
1990 Household Inventory

This is an illustration of the carbonless copy that the respondents kept for their records. It was on yellow paper, as opposed to the white of the original first page. It was perforated along the left margin so that it could be easily torn out of the questionnaire booklet.

DINING ROOM

For All such items, please give:
1) the total number of pieces,
AND EITHER
2) the total current cash value,
OR
3) the original purchase cost, and average number of years owned.

(1) Total No. of Pieces		(2) Total Current Cash Value	(3) Total Original Purchase Costs	Average Number of Years Ago Items Obtained
____	Unattached Buffet/Bar	$____	$____	____Years Ago
____	Chairs	$____	$____	____Years Ago
____	Tables	$____	$____	____Years Ago
____	Unattached China Cabinets	$____	$____	____Years Ago
____	China	$____	$____	____Years Ago
____	Glassware	$____	$____	____Years Ago
____	Silverware	$____	$____	____Years Ago
____	Curtains/Drapes/Blinds	$____	$____	____Years Ago
____	Linens	$____	$____	____Years Ago
____	Unattached Carpets/Rugs	$____	$____	____Years Ago
____	Tables	$____	$____	____Years Ago
____	Other	$____	$____	____Years Ago
____	.....	$____	$____	____Years Ago
____	.....	$____	$____	____Years Ago
____	.....	$____	$____	____Years Ago
____	.....	$____	$____	____Years Ago
____	.....	$____	$____	____Years Ago

KITCHEN AND PANTRY

For All such items, please give:
1) the total number of pieces,
AND EITHER
2) the total current cash value,
OR
3) the original purchase cost, and average number of years owned.

(1) Total No. of Pieces		(2) Total Current Cash Value	(3) Total Original Purchase Costs	Average Number of Years Ago Items Obtained
_____	Fresh Food	$_____	$_____	____Years Ago
_____	Canned Food	$_____	$_____	____Years Ago
_____	Frozen Food	$_____	$_____	____Years Ago
_____	Liquor	$_____	$_____	____Years Ago
_____	Freezers	$_____	$_____	____Years Ago
_____	Refrigerators	$_____	$_____	____Years Ago
_____	Microwave Ovens	$_____	$_____	____Years Ago
_____	Chairs	$_____	$_____	____Years Ago
_____	Tables	$_____	$_____	____Years Ago
_____	Dishes & Crockery	$_____	$_____	____Years Ago
_____	China	$_____	$_____	____Years Ago
_____	Glassware & Crystal	$_____	$_____	____Years Ago
_____	Silverware	$_____	$_____	____Years Ago
_____	Knives/Other Utensils	$_____	$_____	____Years Ago
_____	Pans & Cooking Ware	$_____	$_____	____Years Ago
_____	Curtains/Drapes/Blinds	$_____	$_____	____Years Ago
_____	Appliances	$_____	$_____	____Years Ago
_____	Desk/File Cabinets	$_____	$_____	____Years Ago
_____	Lamps	$_____	$_____	____Years Ago
_____	Other	$_____	$_____	____Years Ago

BEDROOMS

For All such items, please give:
1) the total number of pieces,
AND EITHER
2) the total current cash value,
OR
3) the original purchase cost, and average number of years owned.

(1) Total No. of Pieces		(2) Total Current Cash Value	(3) Total Original Purchase Costs	Average Number of Years Ago Items Obtained
____	Beds	$____	$____	____Years Ago
____	Box Springs/Mattresses	$____	$____	____Years Ago
____	Bedding/Bedspreads/Etc	$____	$____	____Years Ago
____	Chest of Drawers	$____	$____	____Years Ago
____	Night Tables	$____	$____	____Years Ago
____	Other Tables	$____	$____	____Years Ago
____	Lamps	$____	$____	____Years Ago
____	Chairs	$____	$____	____Years Ago
____	Trunks (Hope Chests)	$____	$____	____Years Ago
____	Curtains/Drapes	$____	$____	____Years Ago
____	Unattached Rugs	$____	$____	____Years Ago
____	Pictures	$____	$____	____Years Ago
____	Television Sets	$____	$____	____Years Ago
____	Other	$____	$____	____Years Ago
____		$____	$____	____Years Ago
____		$____	$____	____Years Ago
____		$____	$____	____Years Ago
____		$____	$____	____Years Ago
____		$____	$____	____Years Ago
____		$____	$____	____Years Ago

MEN'S CLOTHING

For All such items, please give:
1) the total number of pieces,
AND EITHER
2) the total current cash value,
OR
3) the original purchase cost, and average number of years owned.

(1) Total No. of Pieces		(2) Total Current Cash Value	(3) Total Original Purchase Costs	Average Number of Years Ago Items Obtained
_____	Coats and Jackets	$_____	$_____	____Years Ago
_____	Raincoat	$_____	$_____	____Years Ago
_____	Ties/Neckwear	$_____	$_____	____Years Ago
_____	Pants	$_____	$_____	____Years Ago
_____	Shirts	$_____	$_____	____Years Ago
_____	Suits	$_____	$_____	____Years Ago
_____	Sweaters	$_____	$_____	____Years Ago
_____	Underwear	$_____	$_____	____Years Ago
_____	Socks (pairs)	$_____	$_____	____Years Ago
_____	Shoes and Boots (pairs)	$_____	$_____	____Years Ago
_____	Jewelry	$_____	$_____	____Years Ago
_____	Belts	$_____	$_____	____Years Ago
_____	Other	$_____	$_____	____Years Ago
_____		$_____	$_____	____Years Ago
_____		$_____	$_____	____Years Ago
_____		$_____	$_____	____Years Ago
_____		$_____	$_____	____Years Ago
_____		$_____	$_____	____Years Ago
_____		$_____	$_____	____Years Ago
_____		$_____	$_____	____Years Ago

WOMEN'S CLOTHING

For All such items, please give:
1) the total number of pieces,
AND EITHER
2) the total current cash value,
OR
3) the original purchase cost, and average number of years owned.

(1) Total No. of Pieces		(2) Total Current Cash Value	(3) Total Original Purchase Costs	Average Number of Years Ago Items Obtained
____	Coats and Jackets	$____	$____	____Years Ago
____	Raincoats	$____	$____	____Years Ago
____	Dresses	$____	$____	____Years Ago
____	Pants & Slacks	$____	$____	____Years Ago
____	Skirts	$____	$____	____Years Ago
____	Blouses & Shirts	$____	$____	____Years Ago
____	Suits	$____	$____	____Years Ago
____	Sweaters	$____	$____	____Years Ago
____	Underwear	$____	$____	____Years Ago
____	Socks/Stockings (pairs)	$____	$____	____Years Ago
____	Shoes and Boots (pairs)	$____	$____	____Years Ago
____	Handbags/Purses	$____	$____	____Years Ago
____	Hats	$____	$____	____Years Ago
____	Jewelry	$____	$____	____Years Ago
____	Scarves	$____	$____	____Years Ago
____	Other	$____	$____	____Years Ago
____		$____	$____	____Years Ago
____		$____	$____	____Years Ago
____		$____	$____	____Years Ago
____		$____	$____	____Years Ago

CHILDREN'S CLOTHING

For All such items, please give:
1) the total number of pieces,
AND EITHER
2) the total current cash value,
OR
3) the original purchase cost, and average number of years owned.

(1) Total No. of Pieces		(2) Total Current Cash Value	(3) Total Original Purchase Costs	Average Number of Years Ago Items Obtained
____	Coats and Jackets	$____	$____	____Years Ago
____	Raincoats	$____	$____	____Years Ago
____	Dresses	$____	$____	____Years Ago
____	Pants	$____	$____	____Years Ago
____	Skirts	$____	$____	____Years Ago
____	Suits	$____	$____	____Years Ago
____	Sweaters	$____	$____	____Years Ago
____	Shirts/Blouses	$____	$____	____Years Ago
____	Socks/Stockings (pairs)	$____	$____	____Years Ago
____	Shoes and Boots (pairs)	$____	$____	____Years Ago
____	Sportswear	$____	$____	____Years Ago
____	Underwear	$____	$____	____Years Ago
____	Jewelry	$____	$____	____Years Ago
____	Other	$____	$____	____Years Ago
____		$____	$____	____Years Ago
____		$____	$____	____Years Ago
____		$____	$____	____Years Ago
____		$____	$____	____Years Ago
____		$____	$____	____Years Ago
____		$____	$____	____Years Ago

DEN, OFFICE, LIBRARY, OR FAMILY ROOMS

For All such items, please give:
1) the total number of pieces,
AND EITHER
2) the total current cash value,
OR
3) the original purchase cost, and average number of years owned.

(1) Total No. of Pieces		(2) Total Current Cash Value	(3) Total Original Purchase Costs	Average Number of Years Ago Items Obtained
____	Unattached Bookcases	$____	$____	____Years Ago
____	Books	$____	$____	____Years Ago
____	Couches/Sofas	$____	$____	____Years Ago
____	Chairs	$____	$____	____Years Ago
____	Tables	$____	$____	____Years Ago
____	Desk/File Cabinets	$____	$____	____Years Ago
____	Lamps	$____	$____	____Years Ago
____	Curtains/Drapes/Blinds	$____	$____	____Years Ago
____	Unattached Carpets/Rugs	$____	$____	____Years Ago
____	Unattached Bar	$____	$____	____Years Ago
____	Stereo Equipment	$____	$____	____Years Ago
____	Records/CD's/Cassettes	$____	$____	____Years Ago
____	Television Sets	$____	$____	____Years Ago
____	VCR Equipment	$____	$____	____Years Ago
____	Video Tapes	$____	$____	____Years Ago
____	Computer Hardware	$____	$____	____Years Ago
____	Computer Software	$____	$____	____Years Ago
____	Pictures	$____	$____	____Years Ago
____	Sewing Machines	$____	$____	____Years Ago
____	Typewriters	$____	$____	____Years Ago
____	Other	$____	$____	____Years Ago
____		$____	$____	____Years Ago

SPORTS, RECREATION, AND HOBBY ITEMS KEPT IN RESIDENCE

For All such items, please give:
1) the total number of pieces,
AND EITHER
2) the total current cash value,
OR
3) the original purchase cost, and average number of years owned.

(1) Total No. of Pieces		(2) Total Current Cash Value	(3) Total Original Purchase Costs	Average Number of Years Ago Items Obtained
_____	Billiard Table	$_____	$_____	____Years Ago
_____	Camping Equipment	$_____	$_____	____Years Ago
_____	Fishing Equipment	$_____	$_____	____Years Ago
_____	Games	$_____	$_____	____Years Ago
_____	Golf Equipment	$_____	$_____	____Years Ago
_____	Skiing Equipment	$_____	$_____	____Years Ago
_____	Guns/Hunting Equipment	$_____	$_____	____Years Ago
_____	Musical Instruments	$_____	$_____	____Years Ago
_____	Photography Equipment	$_____	$_____	____Years Ago
_____	Sewing Machine & Supplies ...	$_____	$_____	____Years Ago
_____	Tennis Equipment	$_____	$_____	____Years Ago
_____	Bicycles	$_____	$_____	____Years Ago
_____	Exercise Equipment	$_____	$_____	____Years Ago
_____	Toys	$_____	$_____	____Years Ago
_____	Collection (Stamps, etc.)	$_____	$_____	____Years Ago
_____	Other	$_____	$_____	____Years Ago
_____	.....	$_____	$_____	____Years Ago
_____	.....	$_____	$_____	____Years Ago
_____	.....	$_____	$_____	____Years Ago
_____	.....	$_____	$_____	____Years Ago

LAUNDRY, BASEMENT, AND GARAGE ITEMS

For All such items, please give:
1) the total number of pieces,
AND EITHER
2) the total current cash value,
OR
3) the original purchase cost, and average number of years owned.

(1) Total No. of Pieces		(2) Total Current Cash Value	(3) Total Original Purchase Costs	Average Number of Years Ago Items Obtained
_____	Chairs.....	$_____	$_____	____Years Ago
_____	Tables.....	$_____	$_____	____Years Ago
_____	Clothes Dryer.....	$_____	$_____	____Years Ago
_____	Ironing Equipment.....	$_____	$_____	____Years Ago
_____	Freezer.....	$_____	$_____	____Years Ago
_____	Refrigerator.....	$_____	$_____	____Years Ago
_____	Luggage.....	$_____	$_____	____Years Ago
_____	Hand Tools.....	$_____	$_____	____Years Ago
_____	Power Tools.....	$_____	$_____	____Years Ago
_____	Lawn & Garden Tools.....	$_____	$_____	____Years Ago
_____	Work Bench.....	$_____	$_____	____Years Ago
_____	Barbecue Equipment.....	$_____	$_____	____Years Ago
_____	Other Items.....	$_____	$_____	____Years Ago
_____	.....	$_____	$_____	____Years Ago
_____	.....	$_____	$_____	____Years Ago
_____	.....	$_____	$_____	____Years Ago
_____	.....	$_____	$_____	____Years Ago
_____	.....	$_____	$_____	____Years Ago
_____	.....	$_____	$_____	____Years Ago
_____	.....	$_____	$_____	____Years Ago

BATHROOM ITEMS, MEDICAL APPLIANCES, AND MISCELLANEOUS ITEMS
(If Not Already Listed for Other Rooms)

For All such items, please give:
1) the total number of pieces,
AND EITHER
2) the total current cash value,
OR
3) the original purchase cost, and average number of years owned.

(1) Total No. of Pieces		(2) Total Current Cash Value	(3) Total Original Purchase Costs	Average Number of Years Ago Items Obtained
	BATHROOM ITEMS			
____	Medication	$____	$____	____Years Ago
____	Hygiene Items	$____	$____	____Years Ago
____	Towels	$____	$____	____Years Ago
____	Bathroom Appliances	$____	$____	____Years Ago
____	Cosmetics/Perfumes	$____	$____	____Years Ago
____	Other	$____	$____	____Years Ago
	MEDICAL APPLIANCES			
____	Wheelchairs	$____	$____	____Years Ago
____	Walkers	$____	$____	____Years Ago
____	Other	$____	$____	____Years Ago
	MISCELLANEOUS ITEMS			
____	Art Work	$____	$____	____Years Ago
____	Indoor Plants	$____	$____	____Years Ago
____	Telephones	$____	$____	____Years Ago
____	Curtains/Drapes/Blinds	$____	$____	____Years Ago
____	Luggage	$____	$____	____Years Ago
____	Briefcases	$____	$____	____Years Ago
____	Other	$____	$____	____Years Ago
____		$____	$____	____Years Ago
____		$____	$____	____Years Ago

BACKGROUND QUESTIONS

Please fill in the following background questions circling the appropriate number and filling in the blanks.

Q1. From the list below, please circle the number in front of the type of building that most closely matches your residence.
(CIRCLE ONE NUMBER)

1. SINGLE FAMILY
2. LOW-RISE MULTIPLE FAMILY (3 STORIES OR LESS)
3. MID- AND HIGH-RISE MULTIPLE FAMILY (4 OR MORE STORIES)
4. TOWNHOUSE, END UNIT
5. TOWNHOUSE, INSIDE UNIT
6. DUPLEX
7. MOBILE HOME

Q2. From the list below, please circle the number of the building style that most closely matches the style of this residence.
(CIRCLE ONE NUMBER)

1. ONE STORY
2. TWO STORY
3. THREE STORIES
4. SPLIT LEVEL
5. 1 1/2 STORY (WITH THE 1/2 FINISHED)
6. 1 1/2 STORY (UNFINISHED 1/2)
7. 2 1/2 STORY (WITH THE 1/2 FINISHED)
8. 2 1/2 STORY (UNFINISHED 1/2)
9. 3 1/2 STORY (WITH THE 1/2 FINISHED)
10. 3 1/2 STORY (UNFINISHED 1/2)
11. BI-LEVEL (2 STORY WITH 1ST UNFINISHED)
12. OTHER (Please Explain): _____

Q3. From the list below, please circle the number of the heating and/or cooling system that most closely matches the system installed in this home. (CIRCLE ONE NUMBER)

Heating Only:

1. FORCED AIR
2. GRAVITY FURNACE (HOT AIR, NO FAN)
3. FLOOR FURNACE (NO HEAT DUCTS)
4. WALL FURNACE (NO HEAT DUCTS)
5. FLOOR, RADIANT HOT WATER
6. CEILING, RADIANT, ELECTRIC
7. BASEBOARD, ELECTRIC
8. BASEBOARD, HOT WATER
9. RADIATORS, HOT WATER
10. RADIATORS, STEAM

Heating and Cooling:

11. WARMED AND COOLED AIR
12. HEAT PUMP SYSTEM

Cooling Only:

13. EVAPORATIVE WATER COOLER (SINGLE OR SHORT DUCTS)
14. REFRIGERATED, WITH CONDENSER AND DUCTS

Q4. From the list below, please circle the number of the type of exterior wall covering that best matches most of the exterior of this home. (CIRCLE ONE NUMBER)

1. PLYWOOD
2. HARDBOARD SHEETS
3. STUCCO
4. SIDING
5. SHINGLE
6. MASONRY VENEER
7. COMMON BRICK
8. FACE BRICK
9. STONE
10. CONCRETE BLOCK

Q5. From the list below, please circle the number of the roofing type that most closely matches the roof of this home. (CIRCLE ONE NUMBER)

1. COMPOSITION SHINGLE
2. BUILT-UP ROCK (EMBEDDED IN ASPHALT)
3. WOOD SHINGLE
4. WOOD SHAKE
5. CONCRETE TILE
6. CLAY TILE
7. GALVANIZED METAL
8. SLATE
9. COMPOSITION ROLL
10. PLASTIC TILE

Q6. How many bathrooms OF THE FOLLOWING TYPES are there in this home?

There are:_____FULL BATHS (SINK, TOILET, AND TUB, WITH OR WITHOUT SHOWER)

There are:_____3/4 BATHS (SINK, TOILET, AND SHOWER

There are:_____1/2 BATHS (SINK AND TOILET)

Q7. Please give the total square feet of finished floor area for floor area for all rooms in this home, not including the basement. (GIVE YOUR VERY BEST ESTIMATE)

AREA NOT INCLUDING BASEMENT:_____SQUARE FEET

Q8. Please give the total square feet of floor area for the basement in this home. (GIVE YOUR BEST ESTIMATE)

TOTAL BASEMENT AREA:_____SQUARE FEET

FINISHED BASEMENT AREA:_____SQUARE FEET

Q9. Please circle all of the home features listed below that apply to this home: (CIRCLE ALL THAT APPLY)

1. ATTACHED GARAGE
2. DETACHED GARAGE
3. BUILT-IN GARAGE
4. CARPORT
5. UNFINISHED BASEMENT AREA
6. FINISHED BASEMENT AREA
7. OPEN SLAB PORCH
8. FIREPLACE

Q10. What year was your home built? _____

Q11. How many years have you lived at this address? _____YEARS

Q12. How many people live at this residence? _____PEOPLE

Q13. Do you own this home? (circle)

1. YES 2. NO

Q14. If you own this home, how much would it be worth if it were to be sold in the real estate market today? (YOUR BEST GUESS)

$_____

Q15. Has this residence ever been flooded? (circle)

1. YES 2. NO

Q16. If yes above, please indicate below how high the water got relative to the front entryway of this house during the last time it was flooded.

Water was:_____FEET (ABOVE? or BELOW?) the front entryway.
[Circle]

Q17. Do you now have flood insurance for this residence:(Circle)

On the Building(s)? 1. YES 2. NO

On the Contents? 1. YES 2. NO

Q18. If you answered yes to either of the above, please give the dollar amount(s) of flood insurance coverage you now have:

$_____On Buildings

$_____On Contents

Q19. Some people have had flood insurance policies that they have discontinued at some point in the past. Have you ever discontinued a flood insurance policy? (Circle)

1. YES 2. NO

Q20. If you answered yes above, why did you discontinue your policy? (circle)

1. POLICY COST INCREASED
2. LOSS OF JOB/REDUCED INCOME
3. OTHER PERSONAL PROBLEMS
4. DISSATISFACTION WITH PAYMENT AFTER FLOOD
5. NO LONGER CONSIDERED FLOODING A SERIOUS RISK
6. OTHER REASONS (Please Specify):

_____

Q21. If a friend was about to move into your neighborhood and asked for your advice, what would you tell him/her about the risk of flooding? (circle)

5.	4.	3.	2.	1.
VERY HIGH	HIGH	MODERATE	LOW	VERY LOW

Q22. What is your zip code? ___ ___ ___ ___ ___

Q23. What is the marital status of the principal wage earner of this household? (CIRCLE ONE NUMBER)

1. SINGLE
2. MARRIED
3. WIDOWED
4. DIVORCED OR SEPARATED
5. OTHER

Q24. Please circle the number below which indicates the total years of schooling that the principal wage earner of this household completed. (CIRCLE ONE NUMBER)

Grade School	High School	College/Technical	Graduate School
1 2 3 4 5 6 7 8	9 10 11 12	13 14 15 16	17 18 19 20 21+

Q25. What was the age of the principal wage earner of this household on his/her last birthday?

_____YEARS OLD

Q26. The list below contains income categories. Please circle the number of the category that contains your annual household income (before taxes) for 1989. Include income for you and all other members of this household. (CIRCLE ONE NUMBER)

1. UNDER $10,000
2. $10,000 - $19,999
3. $20,000 - $29,999
4. $30,000 - $39,999
5. $40,000 - $49,999
6. $50,000 - $59,999
7. $60,000 - $69,999
8. $70,000 - $79,999
9. $80,000 - $89,999
10. $90,000 - $99,999
11. $100,000 - $124,999
12. $125,000 - $149,999
13. $150,000 - $174,999
14. $175,000 AND OVER

THANK YOU FOR YOUR COOPERATION

YOU MAY MAKE ANY ADDITIONAL COMMENTS BELOW:

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