UNC Wilmington

University of North Carolina Wilmington
601 South College Road
Wilmington, NC 28403-5956

910.962.3283 Phone
910.962.7073 Fax

Volume 1: Determination of Recreation Demand for Federal Shore Protection Study Area: Overview and Methodology
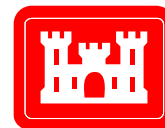
Final Report

Submitted by:

Dr. Jim Herstine, Ph. D., CPRP
Principle Investigator
Assistant Professor
Department of Health and Applied Human Sciences
University of North Carolina Wilmington
herstinej@uncw.edu
910.962.3283

Dr. Bob Buerger, Ph. D.
Co-Investigator
Professor
Department of Environmental Studies
University of North Carolina Wilmington

Carla Isom, MPA
Project Manager
University of North Carolina Wilmington

Dr. Jeffery Hill, Re. D.
Co-Investigator
Associate Dean, College of Arts and Sciences
Associate Professor
Department of Environmental Studies
University of North Carolina Wilmington

Dr. John Whitehead, Ph. D.
Economic Consultant
Associate Professor
Department of Economics
Appalachian State University

US Army Corps of Engineers®
Wilmington District

May 31, 2005

TABLE OF CONTENTS

Final Report

Volume 1: Determination of Recreation Demand for Federal Shore Protection Study Area: Overview and Methodology

ABSTRACT

The federal government is extremely interested in shore protection. This interest developed historically with the intent to stabilize, protect or restore beaches. U.S. Army Corps of Engineers shore protection projects are formulated to provide hurricane and storm damage reduction. Additionally, the federal government recognizes the need to identify recreation benefits for shore protection projects. These recreation benefits are utilized in the determination of the National Economic Development (NED) benefits. Therefore, federally sponsored nourishment projects require sufficient parking and access facilities for the general public (including non-resident users) located reasonably near to the project beaches. Specifically, the stipulation is that communities petitioning the federal government for a beach nourishment project must provide public access along the shoreline at a distance of no more than 0.5 miles apart and parking within at least 0.25 miles from the access point (Engineer Regulation 1105-2-100). Lack of provision of these facilities may constitute a restriction on public access and use, thereby precluding eligibility for U.S. Army Corps of Engineers (USACE) participation. Generally, parking on free or practical terms should be available within a reasonable walking distance of the beach.

The University of North Carolina Wilmington (UNCW) was contracted to undertake a recreation demand study of Bogue Banks, Surf City, North Topsail Beach, Topsail Beach and Brunswick County Beaches, North Carolina. This study area is located between Fort Macon State Park in Carteret County and Shallotte Inlet in Brunswick County and encompasses approximately sixty-seven (67) miles of oceanfront beach communities.

There were four requirements/objectives of this study: (1) to develop a methodology for predicting annual and peak visitation at the subject beaches and the parking requirements to handle projected visitation. The methodology included procedures to identify the area of influence (source of visitation) and to project visitation demand from the area of influence; (2) to evaluate and recommend one of the three approved evaluation methods described in ER1105-2-100 Planning Guidance, Appendix E, Section VII – Recreation (travel cost method TCM; contingent valuation method CVM; and, unit day value UDV method) and to develop a survey instrument to collect the appropriate data to support the recommended evaluation; (3) to collect data on peak hour day user demand and annual recreational demand for each of the Recreation User Segments described in the sampling plan for the study in order to develop a methodology for determining parking space and distribution requirements to support anticipated visitation; and (4) to prepare a report of the findings of the study.

The methodology included six main components: (1) on-site surveys; (2) parking space counts; (3) telephone surveys; (4) focus groups; (5) aerial photography; and (6) secondary data review. This report contains the results from all six (6) of the methodological components of the study conducted between the summer 2003 and summer 2004. This report also contains the information pertinent to requirement/objective (2): to evaluate and recommend one of the three approved evaluation methods described in ER1105-2-100 Planning Guidance, Appendix E, Section VII – Recreation and to develop a survey instrument to collect appropriate data to support the recommended evaluation method.

(The University of North Carolina Wilmington was not required to determine the National Economic Development (NED) benefits for the without project conditions for any of the beaches but was required to provide data which the Corps of Engineers can use to perform the NED analysis).

INTRODUCTION

Coastal communities are experiencing extraordinary population growth and at the same time, the land on which these communities are built is disappearing. With storms eroding the nation's shorelines, millions of homeowners are facing the possibility of watching their property wash out to sea (Isaacs, 2003). Consequently, it has become more important than ever for coastal communities to develop strategies for maintaining the beaches that attract so many of their residents and visitors (Isaacs, 2003).

Many coastal communities have a number of options to manage beach erosion, including structural and non-structural solutions. In 1986, the State of North Carolina's Division of Coastal Management Coastal Resources Commission set guidelines to ban hard oceanfront structures such as jetties, groins and seawalls. In 2003, the North Carolina State Legislature passed legislation making hard oceanfront structures illegal. As a result, North Carolina relies on other forms of beach protection such as nourishment to maintain oceanfront beaches.

Recent severe storm cycles and chronic beach erosion that threaten both physical property and recreational opportunities have initiated increasing interest in oceanfront beach nourishment efforts. Federal involvement in shore protection developed historically with the intent to stabilize, protect or restore beaches. U.S. Army Corps of Engineers shore protection projects are formulated to provide hurricane and storm damage reduction. The U.S. Army Corps of Engineers participates only in those projects formulated exclusively for hurricane and storm damage reduction, and justified based primarily on damage reduction benefits, or a combination of damage reduction benefits plus, at most, a like amount of incidental recreation benefit. This recreation benefit may not be more than fifty percent of costs. It is also intended that beaches receiving public aid should not provide exclusively private benefits. Whenever a hurricane and storm damage reduction project involves beach improvements, real estate interest to insure public use of the Federal project is required (***Appendix A—Scope of Work***).

Many coastal communities are dependent upon the nourishment of local oceanfront beaches in providing both direct and indirect economic benefits. Adequacy of public beach access plays a critical role in the realization of these benefits. Therefore, lack of sufficient parking facilities for the general public (including non-resident users) located reasonably near and accessible to the project beaches may constitute a restriction on public access and use, thereby precluding eligibility for USACE participation. Specifically, the requirement stipulates that communities petitioning the federal government for a beach nourishment project must provide public access along the shoreline at a distance of no more than 0.5 miles apart and parking within at least 0.25 miles from the access point (Engineer Regulation 1105-2-100). In addition, parking on free or practical terms should generally be available within a reasonable walking distance of the beach (***Appendix A—Scope of Work***).

One of the requirements for federal shore protection analyses is to develop a projected annual visitation curve and peak hour day user demand for beach areas under study.

This information is required for the recreational benefits analysis, as well as determining parking and potential transportation requirements for the project areas.

As a result of this, researchers from the Department of Health and Applied Human Sciences and the Department of Environmental Studies at the University of North Carolina Wilmington (UNCW) were contracted to undertake a study of recreation demand on of Bogue Banks, Surf City, North Topsail Beach, Topsail Beach and Brunswick County Beaches, North Carolina.

Bogue Banks, a barrier island, is located in Carteret County and encompasses a twenty-four mile stretch of beach communities. The specific communities involved in the study are (from east to west): Atlantic Beach, Pine Knoll Shores, Salter Path, Indian Beach and Emerald Isle. For purposes of this report, Salter Path and Indian Beach are combined in the results section at the request of the U.S. Army Corps of Engineers, Wilmington District (USACE- Wilmington).

Topsail Island, a barrier island, is located in both Pender and Onslow Counties and encompasses a twenty-two mile stretch of beach communities. The specific communities involved in the study are (from east to west): North Topsail Beach, Surf City and Topsail Beach.

The Brunswick County Beaches in southeastern North Carolina are located between the Cape Fear River and the Shallotte Inlet and encompass a twenty-one mile stretch of beach communities. The specific communities involved in the study are (from east to west): Caswell Beach, Oak Island and Holden Beach.

REQUIRED STANDARDS

Corps of Engineers studies for water and related land resources follow detailed guidance provided in the Planning Guidance Notebook (Engineer Regulation 1105-2-100). This guidance is based upon the Economic and Environmental Principles and Guidelines for Water and Related Land Resources Implementation Studies that were developed pursuant to Section 103 of the Water Resources Planning Act (P.L. 89 – 80) and Executive Order 11747, and which were approved in 1983. A defined six-step process is used to identify and respond to problems and opportunities associated with the Federal objective and specific State and local concerns. The process involves an orderly and systematic approach to making evaluations and decisions at each step so that the public and the decision-makers can be informed of basic assumptions made, the data and information analyzed, risk and uncertainty, the reasons and rationales used, and the significant implications of each. The process concludes with the selection of a recommended plan. Specific aspects of this process are described in more detail in later sections of this document.

PROJECT METHODOLOGY

Based on a contractual scope of work presented to UNCW by the USACE- Wilmington , a study methodology was developed. The following methodology was developed in collaboration with the USACE- Wilmington and external peer reviewers and reflects their recommendations. To meet the purpose of the research requirements/objectives, specific methodological components were developed to address each strategy. The methodology was approved by the USACE- Wilmington   prior to commencement of the study.

Descriptions for each component of the methodology are described within subsequent sections of this document.

Study Requirements/Objectives

1) To develop a methodology for predicting annual and peak visitation at the subject beaches and the parking requirements to handle projected visitation—required development of procedures to identify the area of influence (source of visitation) and to project visitation demand from the area of influence

2) To evaluate and recommend one of the three approved evaluation methods to determine the recreation value of visitation (National Economic Development (NED) Benefits) and develop a survey instrument to collect the appropriate data to support the recommended evaluation method. (*The contractor is not required to determine NED benefits for the without project conditions for any of the beaches, but is required to provide data which the USACE can use to perform the NED analysis*).

3) To collect data on peak hour day user demand and annual recreational demand for each of the Recreation User Segments described in the sampling plan for the study in order to develop a methodology for determining parking space and distribution requirements to support anticipated visitation

4) To prepare a report of the findings of the study

Research Strategy

1) To meet the requirement/objective for developing a methodology to predict annual and peak visitation at the subject beaches and the parking requirements to handle projected visitation (required development of a method of determining the area of influence and a method for predicting visitation from that area), data was collected, reviewed and/or analyzed utilizing the following methodological techniques and procedures:

- On-Site Surveys—to provide data on annual and peak visitation demand and area of influence

- Parking Space Counts—to provide data on annual and peak visitation demand and parking requirements to meet the demand

- Telephone Surveys—to provide data on annual and peak visitation demand, parking requirements and area of influence

- Focus Groups—to provide data on annual and peak visitation demand and area of influence

- Aerial Photography—to provide data on annual and peak visitation demand

- Secondary Data Review—to provide data on annual and peak visitation demand, parking requirements and area of influence

2) To meet the requirement/objective of evaluating and recommending one of the three approved methods to determine the recreation value of visitation (NED Benefits) and to develop a survey instrument to collect the appropriate data to support the recommended evaluation method, data was collected, reviewed and/or analyzed using the following methodological techniques and procedures:

- On-Site Surveys—to provide data to support the recommended evaluation method

- Telephone Surveys—to provide data to support the recommended evaluation method

- Secondary Data Review—to justify the recommendation of one of the approved methods for determining the recreation value of visitation

3) To meet the requirement/objective of collecting data on peak hour day user demand and annual recreational demand for each of the Recreation User Segments described in the sampling plan in order to develop a methodology for determining parking space and distribution requirements to support anticipated visitation, data was collected, reviewed and/or analyzed using the following methodological techniques and procedures:

- On-Site Surveys—to provide data on peak hour day user and annual recreational demand

- Parking Space Counts—to provide data on peak hour day user and annual recreational demand

- Telephone Surveys—to provide data on peak hour day user and annual recreational demand

- Focus Groups—to provide data on peak hour day user and annual recreational demand

Methodology Element Descriptions

On-Site Surveys

Researchers developed a prototypical survey instrument in the spring 2003, using pre-approved Office of Management and Budget questions. Three external peer academic researchers reviewed the survey using the Delphi technique of consensus building and the survey was then sent to the USACE- Wilmington for comments. The Delphi technique is a form of group decision-making in which affiliates never meet face to face and equal participation is controlled by the use of written questionnaires. A problem is identified and affiliates are asked to anonymously give their solutions through a carefully structured questionnaire. Affiliates receive a copy of the results and are again asked for solutions. This process continues until consensus is reached (Allen, 1998). The suggestions from both the external peer reviewers and the USACE- Wilmington were then incorporated into the survey instrument (***Appendix B—On-Site Survey Instrument***). The revised instrument was then approved by the USACE- Wilmington in June 2003.

Fifty-eight data collectors were hired and then trained during a two-day classroom and field training session prior to the survey administration. This training included both an internal validity analysis on June 20th, 2003 and a pre-test of the survey instrument on Fort Fisher State Recreation Area, Kure Beach, North Carolina, a non-targeted beach, on June 21st, 2003.

An inclement weather policy was developed and utilized in the event of severe weather (***Appendix C—Inclement Weather Policy***). If a beach region experienced sporadic rain showers, the data gatherers were to take shelter until the rain stopped and then continue

surveying. In the event of severe and persistent weather, the survey day would be cancelled and potentially rescheduled.

On each of the study days, on-site surveys were conducted between the hours of 10:00 am and 4:00 pm. The data collectors conducted face-to-face interviews with randomly selected beach users about public beach access and public parking. Beach users were selected based on a predetermined methodology to ensure randomization. Specifically, randomization was obtained by data collectors interviewing every fifth person or group they encountered on the beach.

Survey days were July 4th, 5th, 12th, 13th, 19th, 20th, August 2nd, 3rd, 30th and 31st. These days were selected to gauge beach use during the peak season. Due to adverse weather conditions on Topsail Island on July 19th, the July 19th and 20th survey days on this island were rescheduled to August 9th and 10th (***Appendix D—Summary of Study Weather Conditions***).

The 67-miles of study oceanfront beach was subdivided into individual user segments, allowing comparison of adequacy of oceanfront public parking and beach access among individual beach areas (***Appendix E—Study Segments)***. The segments are:

Atlantic Beach Study Segments
AB-1: Tar Landing Road to Wilson Avenue
AB-2: Wilson Avenue to Coral Bay
AB-3: Coral Bay to Fairview Street

Salter Path/ Indian Beach Study Segments
SP/IB1: Sea Isle Drive to 1st Street

Pine Knoll Shores Study Segments
PK-1: Oakleaf Drive to Pine Knoll Street
PK-2: Pine Knoll Street to Murex Drive
PK-3: Murex Drive to Sand Piper Village West

Emerald Isle Study Segments
EI-1: 1st Street to 16th Street
EI-2: 16th Street to Howe Street
EI-3: Howe Street to Pinta Drive
EI-4: Pinta Drive to the Bogue Pier
EI-5: Bogue Pier to Bogue Inlet

North Topsail Beach Study Segments
NT-1: New River Inlet to just past Jenkins Way
NT-2: Jenkins Way to City Hall (oceanfront)
NT-3: City Hall to Stump Sound (oceanfront)
NT-4: Stump Sound to Wicker Street

Surf City Study Segments
SC-1: 9th Street to Wilmington Avenue
SC-2: Wilmington Avenue to Hispanolia Lane

Topsail Beach Study Segments
TB-1: Catherine Avenue to Barwick Avenue
TB-2: Barwick Avenue to Godwin Avenue

Caswell Beach Study Segments
CB-1: Caswell Beach Road

Oak Island Study Segments
OI-1: Ocean Blvd. and McGlamery to East Beach and 58th
OI-2: East Beach and 58th to East Beach and 19th

OI-3: East Beach and 16th Place E. to West Beach and 20th Place West
OI-4: West Beach and 23rd to Kings Lynn Road

Holden Beach Study Segments
HB-1: Ocean Boulevard and East End to Regional Public Access
HB-2: Marsh Side of Holden Beach

Some results of this study were calculated based on user status. For purposes of this study, residential users were those individuals who gave their primary address as that of the study beach community. Day users were those individuals who visited the beach community for a day trip and returned home on the same day. Overnight visitors were those individuals who spent at least one night at the study beach and who did not report the study beach as their primary residence.

Parking Space Counts

Formal oceanfront parking lots were identified and total number of spaces computed prior to the initiation of parking space counts. This was accomplished by utilizing North Carolina Division of Coastal Management data and an on-site assessment by UNCW researchers. Non-oceanfront beach public parking, such as that found on the sound or estuarine side of a barrier island, was excluded from the survey. Additionally, Ft. Macon State Park was excluded from this study due to USACE- Wilmington contractual restrictions. However, all spaces within one-quarter mile of a public beach access point were assumed to be within a reasonable distance for beach users.

Hourly parking space counts were conducted between 10:00 am and 4:00 pm on July 4th, 5th, 12th, 13th, 19th, 20th, August 2nd, 3rd, 30th and 31st, 2003 (August 8th and 9th–Topsail only) to determine the number of available designated parking spaces during hours of peak demand. Every oceanfront beach public parking area identified by the UNCW research team was surveyed utilizing a parking count instrument (*Appendix F—Parking Space Count Instrument*).

On study days, hourly parking space counts were also conducted to determine the number of vehicles parking in non-designated (or "creative") spaces. For example, vehicles that were parked on grass areas adjacent to designated marked parking spaces were considered non-designated parking.

Telephone Surveys

The data generated by this portion of the study was utilized to develop a methodology to predict annual visitation and the parking and access requirements to handle projected visitation. In addition, this data assisted in developing a procedure to identify the source of visitation at each of the study area beaches, as well as a procedure to project visitation demand (revealed and latent) from the area of influence.

For the purposes of this study, **revealed demand** is defined as *demand for a good or service that exists under current conditions* and **latent demand** as *demand that is not yet realized, but may be so if some critical attribute(s) change(s).* **Theoretical peak demand** is therefore considered to be *demand that is the summation of revealed demand and latent demand*.

The population to be sampled included all residents living in North Carolina counties within 120 miles of any of the study beaches and was chosen based upon the results of the on-site survey conducted during the summer 2003 at the study area beaches. The results of this on-site survey demonstrated that the vast majority of day users (approximately 73%) who are the primary users of public beach parking traveled 120 miles or less to get to the

beach. The purpose of utilizing such an extensive area (any North Carolina county within 120 miles of any of the study beaches) was to receive data based on individuals who could potentially day trip to the study beaches, as well as to measure latent demand (***Map 1 – Telephone Survey Data Collection Counties***).

Map 1 –Telephone Survey Data Collection Counties

The University contracted with Survey Sampling, Inc. (SSI) to gather telephone numbers within the designated area. According to SSI (2004), there are an estimated 108 million telephone households in the US. To represent all households in a sample is a challenge due to two main factors: those unlisted by choice and those unlisted by circumstance (mobility). Approximately 30% of telephone households in the US have unlisted numbers. Each year, about 20% of American households move, so that 12-15% of the residential numbers in a typical directory are disconnected. Samples drawn entirely from directories and "plus-one" techniques based on directory seed numbers often significantly under-represent unlisted households. To address these representation issues, SSI developed a variety of random digit methodologies:

I.   Creation of the Random Digit Database
II.   Sample Stratification
III. Sample Selection
IV.   Selection Options

I.   SSI starts with a database of all directory-listed households in the US. Using area code and exchange data regularly obtained from Telcordia and additional databases, this file of directory-listed telephone numbers is subjected to an extensive cleaning and validation process to ensure that all exchanges are currently valid, assigned to the correct area code, and fall within an appropriate set of ZIP Codes.

Most SSI samples are generated using a database of "working blocks." A *block* (also known as a *100-bank* or a *bank*) is a set of 100 contiguous numbers identified by the first two digits of the last four digits of a telephone number. For example, in the telephone number 255-4200, "42" is the block. A block is termed to be *working* if one or more listed telephone numbers are found in that block.

II.   All SSI samples are generated using stratified sampling procedures. Stratified sampling divides the population of sampling units into subpopulations called strata. A separate sample is then selected from the sampling units in each stratum. SSI's database has been stratified by county.

Prior to sample selection, the sample is allocated proportionally across all strata in the defined geography using one of several frame adjustment options. The sampling frame determines the way a sample is distributed across geography at the county level. SSI offers five different measures of size (MOS) stratification frames for its random digit samples: estimated number of telephone households, number of households, total population, total active blocks and "other." The UNCW research team chose to use the

estimated number of telephone households within our sample size. The *Estimated Number of Telephone Households:* Estimates for telephone households are updated annually. The estimates are calculated by subtracting Census non-telephone household counts from current household estimates. Sample units will be allocated to each county in proportion to its share of telephone households.

III. After the sample has been allocated, three methods of systematic sample selection are available. The UNCW research team chose the Random B method of sample selection. **Random B** is an SSI term denoting samples of random numbers distributed across all eligible blocks in proportion to their density of listed telephone households. All blocks within a county are organized in ascending order by area code, exchange, and block number. Once the quota has been allocated to all counties in the frame, a sampling interval is calculated by summing the number of listed residential numbers in each eligible block within the county and dividing that sum by the number of sampling points assigned to the county. From a random start between zero and the sampling interval, blocks are systematically selected in proportion to their density of listed households. Once a block has been selected, a two-digit number is systematically selected in the range 00-99 and is appended to the exchange and block to form a 10-digit telephone number.

IV. SSI's database and sampling software support a variety of other epsem and non-epsem sampling options designed to accommodate different sample specifications or study objectives. The UNCW research team chose to screen for disconnected numbers. The SSI *Sample Screening Service* is a stand-alone, post-production process that identifies non-working or unassigned numbers, as well as modem and fax numbers in random digit telephone samples. It employs a new and proprietary technology that recognizes almost half of these numbers, thereby improving the effective working phones rate of random digit telephone samples by an average of 10-15%.

Once these numbers have been identified, the options available are: 1) *Remove disconnects from the sample.* If these numbers are removed, the final sample file will fall short of the requested sample size. Number removal may be exercised either before replication (sample will have equal sized replicates) or after replication (sample will have unequal sized replicates but each replicate will contain exactly the same "good" telephone numbers as it would have if the sample had not been screened); or 2) *Include disconnects as part of the sample.* If these numbers are retained in the final sample file, they are flagged and may be sorted to the bottom of the file or the bottom of each replicate and printed on separate sample pages. The telephone survey was administered by the Survey Research Laboratory (SRL) at the University of North Carolina Wilmington during May 2004. The Survey Research Laboratory at UNCW specializes in the administration of telephone surveys using random digit dialing (RDD). (Jessica Smith, personal communication September 7, 2004)

Focus Groups

A focus group is a moderated small group discussion concerning a specific issue. Focus groups were conducted during the spring of 2004. Municipal and county officials and community business leaders of the respective Recreation User Segments were invited to attend the focus groups. Participants in the focus groups discussed current trends and expectations concerning parking and access at their respective beach communities. A survey instrument was developed to administer to the focus group attendees (**Appendix G—Focus Group Survey Instrument**). A protocol was developed to guide the focus group discussions (**Appendix H—Focus Group Protocol/Discussion Guide**).

The focus group project was conducted by two consultants and a University of North Carolina Wilmington (UNCW) project manager. One consultant coordinated data collection, conducted focus groups, and prepared the summary reports. Analysis and

reporting was done by a second consultant. The UNCW project manager coordinated the entire process.

A total of nine focus groups representing ten municipalities were conducted between May and August, 2004. The number of participants in each group ranged from one to five. One municipality was invited and did not participate - Salter Path (Bogue Banks). Each session including survey administration lasted for approximately one hour. Each focus group was conducted by one of two moderators, and a note-taker was present at each group. A structured set of focus group questions was used to guide the discussions. The focus group discussion guide was developed by health and recreation faculty at UNCW with input from the two consultants. Each participant completed a consent form prior to the start of data collection, and the project was approved by the UNCW Institutional Review Board.

The moderator and note-taker jointly compiled a report for each municipality summarizing the focus group discussion. Audiotapes were compared to the summaries. Descriptive reports for each municipality were developed. Themes were identified within regional groups (i.e., Bogue Banks, Topsail Island and Brunswick County Beaches), based on the reports. These results followed each region's municipality-level results.

There are a few limitations relevant to these focus groups, including:

- A lack of diversity in groups – most groups had only municipality officials. Business leader opinions were not heard in these groups. Differing opinions may have been missed.

- Small size, including a group of one – sizes ranged from one to five participants; six to eight is usually an ideal focus group size.

- These methods could be considered structured interviews instead of focus groups – because of the small size of the groups and the nature of the questions (i.e., information-gathering rather than idea-generating).

- One municipality is not represented (Salter Path)– While this is a limitation, it may not be serious since the information provided by the other beach municipalities is relatively similar. The addition of this community may not have generated new information.

Aerial Photography

In order to develop estimates of the total number of visitors, as well as the distribution of visitors on the subject beaches, oblique aerial photographs were taken of each study segment during scheduled flyovers of the oceanfront beaches. Photographers accompanied a pilot during the flyovers to capture aerial photographs at various predetermined points located along the oceanfront beach.

The aerial photographs were then composited into a unified mosaic of the island for specific days, as requested. The number and distribution of users within each Recreation User Segment (RUS) was then compiled. Identified individuals each were counted as one user when either on the beach itself or in the water. Individuals in parking lots or on crosswalks were not included in the total. Objects such as beach umbrellas which would potentially occlude individuals were counted as 1.5 users in order to remain consistent with prior USACE user counts based upon aerial photographs. In cases of image irregularities or breaks in image sequencing, data interpolation was used.

The flyovers were undertaken on selected peak use days between the Fourth of July and Labor Day, 2003: July 4th, 5th, 6th, 12th, 20th, 27th, August 3rd, 30th and 31st. Individual beach segments were photographed at various times during the flyover period to obtain a more diverse representation of beach use, yet always occurred between 10:00 am and 2:00 pm in order to remain consistent with beach use data from prior USACE flyovers.

As anticipated, weather affected the quality of the aerial photographs, and in some cases, precluded the completion of photographing selected beach segments on target days. Therefore, in order to maximize image quality as well as maintain consistency between segments of the subject beaches undergoing analysis, aerial photographs from August 31, 2003 were used as the basis for image analysis. Additionally, since August 31, 2003 fell on Labor Day weekend, it was also a peak use day at the subject beaches.

On December 6, 2004, the US Army Corps of Engineers requested analysis of additional aerial photographs on specific dates:
- Atlantic Beach—July 5, 2003
- Pine Knoll Shores—July 5, 2003
- Salter Path/Indian Beach—July 5, 2003
- Emerald Isle—July 5, 2003
- North Topsail Beach—July 4, 2003
- Surf City—July 5, 2003
- Topsail Beach—July 5, 2003
- Caswell Beach—August 3, 2003
- Oak Island— August 3, 2003
- Holden Beach—July 5, 2003

Secondary Data Review

Secondary data from sources such as the Department of Transportation, the Statewide Comprehensive Outdoor Recreation Plan (SCORP), the U.S. Census, various county planning departments, scholarly journals, and various municipal and county officials were reviewed to support the primary data. The USACE- Wilmington also provided data they deemed relevant to the study. Secondary data was reviewed to assist in the identification of the area of influence, existing and future population centers, transportation systems, recreation activity demand, existing beach recreation facilities and available parking.

NATIONAL ECONOMIC DEVELOPMENT BENEFITS (NED) RECOMMENDATION

Both the on-site and telephone surveys contain contingent valuation method (CVM) questions and information necessary to conduct a travel cost method (TCM) analysis. Both the CVM and the TCM can be used to estimate the National Economic Development (NED) economic benefits of (a) one day trip at a particular site, (b) trips during a recreation season, and (c) beach quality. The TCM models can also be used to estimate peak demand under various conditions. The following describes how the survey data can be used to estimate these values.

On-Site Survey

The on-site survey (*Appendix B—On-Site Survey Instrument*) contains a contingent valuation method (CVM) question and information necessary to conduct a travel cost

method (TCM) analysis. Both approaches are designed to estimate the economic benefits one day trip at a particular site.

Contingent Valuation Method

The CVM question asks beach goers if they would be willing to pay higher travel costs and still visit the particular beach of the interview. The question is in the dichotomous choice (i.e., yes/no) format with randomly assigned values for higher travel costs as the payment vehicle. The additional travel costs were chosen for day-trippers. The question is not appropriate for estimating NED benefits for those who take overnight trips.

Let the yes/no responses be represented by the variable *YES* where *YES* = 1 if yes and 0 if no. The higher travel costs, Δp, are represented by the variable *A*. The willingness to pay for the day at the beach can be estimated with either the logit or probit regression model. The probability that *YES* = 1 is

$$\Pr(YES = 1) = f(\alpha_0 + \alpha_1 A + \gamma s + e)$$

where the *α*s are coefficients, γ is a coefficient vector, *s* is a vector of demographic and other covariates that may affect the value of a beach day, and *e* is the error term. Potential covariates might include socioeconomic (e.g., income) and beach quality (e.g., beach width) characteristics. Subscripts for individuals in the sample, i = 1, … , n, are suppressed for simplicity.

The benefits, or willingness to pay, *WTP*, of a beach day is equal to the negative of the ratio of the regression coefficients:

$$WTP(\Delta p)_{CVM} = \frac{(a_0 + \gamma \bar{s})}{-\alpha_1}$$

where $\bar{s}$ are the means of the independent variables. Note that other functional forms, such as the log willingness to pay, *ln*(*A*), may fit the data better. In these cases the formula for willingness to pay will differ. See Boyle (2003) and Haab and McConnell (2002) for technical detail.

Travel Cost Method

The random utility model (RUM) variant of the TCM can be used to estimate the benefit of a trip to a particular beach site. The RUM uses travel distance and income information to estimate the probability that the recreation site will be chosen. Travel distance is measured externally from the survey data using a program such as PCMiler. These programs calculate the minimum travel distance from the zip code of the traveler's residence to the zip code of the destination. A round trip travel cost, or access price, variable is then constructed as:

$$p = (2 \times c + d) + (\theta w \times [2 \times d / mph])$$

where *p* is the site access price, *c* is the travel cost per mile (i.e., $0.35), *d* is the travel distance, *θw* is the opportunity cost of time (measured as a percentage, 0 < *θ* < 1, of the hourly wage rate, *w*), and *mph* is the average miles per hour for the area. The hourly wage rate can be estimated from annual household income as income/2000 hours.

The RUM method assumes that beach goers consider the quality characteristics and costs of each beach site when making their site choice. The utility from each site j, j = 1, …

, m, is compared and the site with the highest utility is chosen. The utility function, v(p, q), is linear:

$$v_j = \beta_0 p_j + \beta_1 q_j + \varepsilon$$

where the βs are coefficients, v is utility, q is a vector of site quality characteristics, and ε is the error term.

The site choice is estimated with the conditional logit model in which the site choice dependent variable is $j = 1$ if site j is chosen and 0 otherwise. The probability of choosing site j is

$$\Pr(j = 1) = \frac{\exp(v_j)}{\sum_{j=1}^{n} \exp(v_j)}$$

Subscripts for individuals in the sample are suppressed for simplicity. See Parsons (2003) and Haab and McConnell (2002) for technical detail.

Welfare measures are calculated from the estimated conditional logit model. The willingness to pay for site access is

$$WTP(\Delta p)_{TCM} = \frac{v(p', q^o) - v(p^o, q^o)}{-\beta_1}$$

where $v(p^o, q^o)$ represents the status quo utility and $v(p', q^o)$ represents utility with a change in travel costs that denies access a single site or multiple sites, $\Delta p = p' - p^0 > 0$ and $(x \mid p') = 0$. The willingness to pay for a change in quality is

$$WTP(\Delta q)_{TCM} = \frac{v(p^o, q') - v(p^o, q^o)}{-\beta_1}$$

where $v(p^o, q')$ represents utility with an improvement in site quality, $\Delta q = q' - q^0 > 0$.

National Economic Development Benefits

The CVM and the site choice TCM (i.e., RUM) both can be used to develop valid and reliable estimates of NED benefits. However, the CVM and the RUM both have drawbacks. The CVM is based on hypothetical choices which may lead to bias. The site choice RUM is based on revealed behavior but the model requires the assumption that the range of trip choices is constrained to beach trips in southeastern North Carolina.

Perhaps the best approach to obtaining valid and reliable estimates of NED benefits is to pursue both approaches and test for convergent validity. Convergent validity is obtained when two methods achieve the same results. In this case, convergent validity would be achieved if $WTP(\Delta p)_{CVM} = WTP(\Delta p)_{TCM}$. A divergence in WTP estimates would create uncertainty in the use of either benefit estimate. Without convergent validity the best strategy for benefit cost analysis would be to (i) use the benefit estimate that appears most

reasonable or (ii) in the absence of a clearly preferred estimate, use both estimates in a sensitivity analysis of policy.

In order to derive aggregate NED benefits for both the CVM and the TCM, the individual site benefits should be multiplied by an estimate of the number of trips at each site. This estimate is determined externally from the survey data.

Telephone Survey

The focus of the telephone survey (**Appendix I—Telephone Survey Instrument**) is estimation of the benefits of beach quality. The survey collects information that can be used with the CVM and TCM to estimate the benefits of beach width and parking facilities.

Travel Cost Method: Annual Visitation Model

The telephone survey collects revealed preference (RP) and stated preference (SP) data for analysis using the single-site TCM. The single-site TCM estimates a demand curve. The RP data is based on past beach trips that were actually taken. The SP data is based on future trips that would be taken under various hypothetical conditions. The SP data is used to simulate a change in demand from changes in beach quality that can be used to estimate the economic benefits of that change.

The RP and SP trip data is collected for various levels of aggregation for which different demand models can be estimated depending on policy analysis needs (e.g., trips to southeastern North Carolina, Carteret County, and Atlantic Beach). The following describes a demand model for individual beaches within each county -- the most narrow definition of site.

Consider first the single-site TCM demand model with RP data. This model can be used to estimate the economic benefits for a beach trip (not site access) and trips across season. A common functional form for the single-site demand model is the semi-log. The semi-log linear demand model for site j is

$$\ln x_j^{RP} = \phi_0 + \phi_1 p_j + \phi_2 p_k + \phi_3 y + \phi_4 q_j + \mu^{RP}$$

where x_j is the number of trips to site j, p_j is the round trip travel costs to site j, p_k is the round trip travel costs to a substitute site k, y is income, q_j is a vector of site quality variables, the ϕs are coefficients and μ is the error term. Subscripts for individuals in the sample are suppressed for simplicity. Single-site TCM demand models are typically estimated with the Poisson or negative binomial regression models which take into account the fact that recreation trips are integers. See Parsons (2003) and Haab and McConnell (2002) for technical detail.

The economic benefit of a single beach trip is

$$\frac{CS_j}{x_j^{RP}} = \frac{1}{-\phi_1}$$

where CS/x is the consumer surplus per trip. The economic benefit of all trips during the recreation season is

$$CS_j = \frac{x_j^{RP}}{-\phi_1}$$

where *CS* is the consumer surplus per season. Stated preference trip questions are asked about future trips (1) under status quo conditions, (2) with an improvement in parking conditions (i.e., no time spent searching for a parking spot, reasonable fees, and no change in congestion) and (3) with an increase in beach width (i.e., adding an average of 100 feet to beach width with periodic beach nourishment every 3 to 5 years). The pooled single-site SP TCM demand model is

$$\ln x_{jit}^{SP} = \phi_0 + \phi_1 p_{ji} + \phi_2 p_{ki} + \phi_3 y_i + \phi_4 q_{jt} + \mu_{it}^{SP}$$

where t = 1, 2, 3 are the hypothetical situations described above. Pooling the data requires that panel data methods be used to account for the separate variance across individuals in the sample, i, and scenarios, t.

The economic benefit of a change in trip quality during the recreation season is

$$CS_j(\Delta q) = \frac{\left(x_j^{SP} \mid q_j'\right) - \left(x_j^{SP} \mid q_j^0\right)}{-\phi_1}$$

where $\Delta q = q' - q^0 > 0$ is an improvement in quality (e.g., parking, beach width).

Considering that the SP data is hypothetical, it is potentially subject to the same type of bias that afflicts the willingness to pay responses from the CVM. The currently preferred approach to mitigating this bias is to combine and jointly estimate the RP and SP data. The estimated demand model is

$$\ln x_{jit}^{\lambda} = \phi_0 + \phi_1 p_{ji} + \phi_2 p_{ki} + \phi_3 q_{jt} + \phi_4 y_i + \delta SP + \mu_{it}^{\lambda}$$

where λ = RP, SP and SP = 1 if hypothetical trip data and 0 if actual trip data. The SP variable is included to test for hypothetical bias. A typical result is that *δ* > 0 where SP trips exceed RP trips. Benefit estimation proceeds as above with, typically, SP = 0. See Whitehead, Haab, and Huang (2000) for technical detail on jointly estimating RP and SP data in the single-site model.

Travel Cost Method: Peak Demand Model

The TCM demand model described above can be used to generate estimates of annual visitation under current parking and beach conditions and peak visitation. The most reliable estimate of current visitation for each individual is the average of the RP trips at the county, $\overline{x}_j^{RP}$, j = 1, ... , 3, and beach, $\overline{x}_k^{RP}$, k = 1, ... , 16, level (see appendix for counties and beaches). The estimate of the annual visitation at each county, X_j, or beach, X_k, is the product of the study population (i.e., those who took "oceanfront beach trips to the southeastern North Carolina coast" in 2003), *n*, and the average number of visits at each site:

$$X_j = n \times \overline{x}_j^{RP}$$
$$X_k = n \times \overline{x}_k^{RP}$$

Peak visitation can be estimated three ways, with (a) improved parking (t = 2), (b) wider beaches (t = 3) and (c) improved parking and wider beaches. Quality improvements may

lead to two types of changes in visitation: increases in participation and increases in intensity. The study population includes those who "considered going to an oceanfront beach in North Carolina during the last year." Some of those who considered a trip may not have taken a trip to the southeastern North Carolina coast during the past year. If those who did not take trips in the past year were encouraged to take future trips with the quality improvement the level of participation increases. The study population becomes $n' = n + \Delta n(\Delta q)$, where Δn represents the increased level of participation.

To estimate the change in intensity, consider again the jointly estimated RP-SP single-site TCM demand model with estimated coefficients and mean values of covariates with the status quo beach conditions (t = 1):

$$\hat{x}^o_{jt=1} = \exp\left(\hat{\phi}_0 + \hat{\phi}_1 \bar{p}_j + \hat{\phi}_2 \bar{p}_k + \hat{\phi}_3 \bar{y} + \hat{\phi}_4 q^o_{jt=2} + \hat{\phi}_5 q^o_{jt=3}\right)$$

Where the *q*s are dummy variables equal to 0 under the status quo, $q^o = 0$, and 1 under the improvement scenario, $q' = 1$ and SP = 0.

Considering individual beaches, *j*, Predicted individual trips under peak demand alternatives (a), (b), and (c) are:

$$\hat{x}^a_{jt=2} = \exp\left(\hat{\phi}_0 + \hat{\phi}_1 \bar{p}_j + \hat{\phi}_2 \bar{p}_k + \hat{\phi}_3 \bar{y} + \hat{\phi}_4 q'_{jt=2} + \hat{\phi}_5 q^o_{jt=3}\right)$$

$$\hat{x}^b_{jt=3} = \exp\left(\hat{\phi}_0 + \hat{\phi}_1 \bar{p}_j + \hat{\phi}_2 \bar{p}_k + \hat{\phi}_3 \bar{y} + \hat{\phi}_4 q^o_{jt=2} + \hat{\phi}_5 q'_{jt=3}\right)$$

$$\hat{x}^c_{jt=2,3} = \exp\left(\hat{\phi}_0 + \hat{\phi}_1 \bar{p}_j + \hat{\phi}_2 \bar{p}_k + \hat{\phi}_3 \bar{y} + \hat{\phi}_4 q'_{jt=2} + \hat{\phi}_5 q'_{jt=3}\right)$$

Predicted aggregate trips (i.e., peak demand) under peak demand alternatives (a), (b), and (c) are:

$$X^a = n'^a \times \hat{x}^a_{jt=2}$$

$$X^b = n'^b \times \hat{x}^b_{jt=3}$$

$$X^c = n'^c \times \hat{x}^c_{jt=2,3}$$

Similar estimates can be constructed at the county level.

Methodology for Predicting the Associated Parking Requirements

Beach trips at the southeastern North Carolina beaches are constrained by the number of parking and public access spaces. The TCM demand model can be used to forecast the parking needs associated with peak demand. Previous research (Herstine, et al.) has found that public beach parking lots are at capacity during peak beach days (e.g., July 4). Let Kj be public parking capacity (i.e., current number of parking spaces in public lots) at each j beach. The coefficients in the semi-log demand model above approximate the percentage change in trips taken. Therefore, estimates of the additional parking spaces required, ΔK_j, under the various scenarios are

$$\Delta K^a_j = K_j \times \hat{\phi}_4$$

$$\Delta K^b_j = K_j \times \hat{\phi}_5$$

$$\Delta K^c_j = K_j \times \left(\hat{\phi}_4 + \hat{\phi}_5\right)$$

For example, suppose that a beach has K = 500 parking spaces. If $\hat{\phi}_4$ = .10 then the increase in the required number of spaces is 10% of 500, ΔK = 50. The total number of spaces required is K + ΔK (e.g, 500 + 50 = 550). Note that this methodology adopts the assumption that the distribution of trips across j beaches does not change with improved beach conditions. Note also that the standard error associated with the regression coefficients can be used to construct confidence intervals for the estimates of ΔK..

Contingent Valuation Method

The CVM question asks current and future beach goers if they would be willing to pay higher parking fees for the beach nourishment program that would lead to wider beaches. The question is in the dichotomous choice (i.e., yes/no) format. Let the yes/no responses be represented by the variable BUY_1 where BUY_1 = 1 if the respondent would buy the beach parking permit and 0 if not. The randomly assigned parking fees are represented by the variable B_1.

Respondents who state that they would not buy the parking permit are asked if they would buy the permit if it cost B_2 = $5 (if beach nourishment costs were lower than expected). Respondents who state that they would buy the parking permit are asked if they would buy the permit if it cost B_2 = $50 (if beach nourishment costs were higher than expected). Responses to the second willingness to pay question are constructed similarly to the first question: BUY_2 = 1 if the respondent would buy the beach parking permit and 0 if not.

The willingness to pay for the quality improvement can be estimated with a logit or probit regression model that takes into account the multiple responses (e.g., random effects probit model). The probability that BUY = 1 is

$$\Pr(BUY_t = 1) = f(\pi_0 + \pi_1 B_t + \tau s + \eta_t)$$

where the πs are coefficients, τ is a coefficient vector, s is a vector of demographic and other covariates that may affect the value of a beach day, η is the error term, and t = 1, 2. Potential covariates might include socioeconomic and beach quality characteristics. Subscripts for individuals in the sample are suppressed for simplicity.

The willingness to pay, *WTP*, of the quality improvement is equal to the negative of the ratio of the regression coefficients:

$$WTP(\Delta q)_{CVM} = \frac{(\pi_0 + \tau \bar{s})}{-\pi_1}$$

where $\bar{s}$ are the means of the independent variables. Note that, as above, other functional forms, such as the log willingness to pay, *ln(A)*, may fit the data better. In these cases the formula for willingness to pay will differ. See Boyle (2003) and Haab and McConnell (2002) for technical detail. The purpose of the follow-up willingness to pay questions is to increase the statistical efficiency of the willingness to pay estimates. However, the follow-up questions may suffer from bias due to incentive incompatibility and anchoring. If these problems are encountered they are readily controlled (see Whitehead, 2002, 2004).

National Economic Development Benefits

The CVM and the single-site TCM both can be used to develop valid and reliable estimates of NED benefits. The TCM model can be used to estimate NED benefits for individual and seasonal beach trips. The TCM model can be used to estimate NED benefits for two types of quality improvement, improved parking and beach width, with the SP and jointly estimated RP-SP data. The CVM can be used to estimate the NED benefits of beach width.

As above, there is little obvious reason to prefer the TCM or CVM models for estimation of the NED benefits of beach width, a priori. However, respondents may be quite sensitive to the payment vehicle in the CVM questions. Respondents may anchor their responses on what they feel the appropriate beach fee should be. Their BUY responses will then be a weighted average of their willingness to pay for beach width and the appropriate beach fee. This anchoring may bias the WTP estimate from the CVM. For this reason the TCM NED benefit estimates are preferred for beach quality. The CVM estimates should be used for tests of convergent validity.

In order to derive aggregate NED benefits for both the CVM and the TCM, the individual benefits (i.e., CS, WTP) should be multiplied by the relevant number of beach recreation participants.

RECOMMENDED METHODOLOGY FOR FUTURE PROJECTS

The recommended methodology to satisfy the study requirements/objectives includes eight (8) components. The components are: 1) On-Site Survey; 2) Parking Space Counts; 3) Aerial Photography; 4) Focus Groups; 5) Telephone Survey; 6) Secondary Data Review; 7) Annual Visitation Model and; 8) Peak Demand Model.

On-Site Survey

Purpose

To provide data on annual and peak visitation demand, area of influence and NED benefits.

Discussion

In order to facilitate the administration of the on-site survey, a "survey coordinator" should be hired or appointed. This individual would be responsible for the overall administration and management of the on-site survey. Responsibilities would include: the hiring and training of the data collectors; determining efficient and logical data collection sections; supervising the day-to-day data collection logistics; and, dealing with on-site problems as they occur.

The on-site survey itself is based on the administration of a personal interview questionnaire (*Appendix J—Recommended On-Site Survey Instrument*). Specific questions are designed to derive data regarding:

Question Number(s)	Type of Question	Purpose	Conclusions
1, 17, 18	Demographics	Determine user characteristics	Know who beach users are

3	User category	Determine user characteristics	Know who beach users are
3b	Distance traveled to reach the beach	Determine sphere of influence	Know where beach users are coming from
4	Mode of transportation	Determine how users arrive at beach	Know transportation infrastructure requirements
2	Party size	Determine number of people per party and per vehicle	Know how many beach users there are
5	Rating of quality of public parking	Determine beach user perceptions of parking	Know if quality of public parking is adequate
6	Time spent walking from available parking to oceanfront beach	Determine distance of available parking from oceanfront beach	Know if available parking is reasonably close to the beach
7, 8	Time of arrival and departure at beach	Determine times users are on the oceanfront beach	Know oceanfront beach density
9	Anticipated beach visitation	Determine future beach visitation	Know oceanfront beach use future expectations
10, 12	Importance of specific beach attributes, such as public parking, restroom facilities, etc.	Determine beach user perceptions of important beach attributes	Know what facilities and services are viewed as adequate
11	Changes in beach visitation patterns given increase in availability of public parking	Determine latent demand	Know number of beach users if certain conditions changed
13, 14, 15, 16	Economic data on expenditures, valuation and constraints	Determine how much users spend to come to the beach	Know the economic impacts and economic benefits of oceanfront beach visitation

The on-site survey should be conducted during the summer months between the hours of 10:00 am and 4:00 pm at the study area to determine the annual and peak visitation demand. The recommended dates are five (5) summer weekends which must include the Memorial Day, Fourth of July and Labor Day weekends and two (2) additional weekends, for a total of ten (10) data collection dates. The dates of administration of the on-site survey on holiday weekends should be Saturday and Sunday. However, in case of

inclement weather, alternative dates, i.e. Monday or Friday, should be utilized (***Appendix K—Recommended Inclement Weather Policy***).

Data collectors should be hired and trained at least one (1) month prior to the Memorial Day weekend data collection. Initial training should involved classroom instruction that includes understanding the purpose of the study, the intent of each survey question, instruction in correct data collection techniques to include sampling procedures, safety information and protocol on dealing with unexpected events. In addition, at least two (2) on-site data collection simulations should be scheduled and undertaken on non-targeted beaches where data collectors can practice interviewing techniques. Only in this way can problems associated with the on-site data collection process be realized and corrected.

The recommended sampling procedure focuses on ensuring randomization in the selection of study subjects. Data collectors should start at their assigned data collection section and begin walking toward the opposite end of the section. The data collectors should interview the first individual or group they intersect and every 5th subsequent individual or group they encounter until they reach the opposite of their assigned study section. Once the data collector has reached the end of the study area, he/she turns around and begins the process in the direction they just came from. In the course of sampling, data collectors will not re-interview a previously contacted individual or group if that individual or group would fall into the sampling sequence again. In this case, the data collector will select the next individual or group and begin the randomized count from there.

The determination of the length of a data collection section will be based upon the density of beach users in any locale. As such, some data collectors will be assigned relatively short stretches of beach due to large numbers of beach users. In determining the size of the data collection sections and planning the allocation of data collectors themselves, the survey coordinator may wish to use know beach features such as nearness to beach access facilities; nearness to public parking facilities; nearness to public piers; availability of public amenities such as concessions, showers and restrooms; the location of beach front hotels; and, nearness and number of beach front residences. Beach users tend to congregate in close proximity to these features and conditions. Allocation of data collectors may need to be increased in certain data collection sections as the on-site survey administration progresses. This increase may be due to fluctuations in daily beach use and require the assignment of additional data collectors in high density beach sections.

Parking Space Counts

Purpose

To provide data on annual and peak visitation demand and parking requirements to meet the demand.

Discussion

Parking space counts are to be done in conjunction with the on-site survey. On study days, hourly public parking space counts will be conducted to determine the number of vehicles parking in designated and non-designated spaces. Designated parking spaces are those which are recognized as legal public parking locations. Non-designated parking spaces are those locations in public parking areas which are not recognized as legal parking spaces. For example, vehicles that are parked on grass areas adjacent to

designated marked parking spaces are considered to be in non-designated parking spaces.

At least two weeks prior to commencement of the on-site survey data collection, those data collectors assigned to the parking lot count will physically visit each study area and identify all designated public parking areas. The data collectors will then record the location of each area using GPS coordinates of the approximate center of the lot, as well as physical location properties such as street intersections or unique physical features. The number of marked, designated spaces is then recorded. To further document the location and size of each parking area, data collectors will take photographs of each designated parking area.

To ensure consistency between on-site survey data collection and parking space counts, the data should be collected between the hours on 10:00 am and 4:00 pm each study day. To ensure consistency between data for each parking area, counts should be made on the hour (e.g. 10:00 am and 11:00 am). This procedure may require a significant number of parking space data collectors given that many beaches have heavy vehicular traffic on weekends precluding ease of transportation between individual areas. It will be the responsibility of the coordinator to make the determination of both quantity and distribution of data collectors in order to facilitate the hourly collection of the data.

During each study day on the hour, data collectors will record the number of unoccupied designated parking spaces in each lot and document these data on the Parking Space Count Instrument (*Appendix L—Recommended Parking Space Count Instrument*). The number of vehicles parking in non-designated spots will also be recorded on the instrument.

Aerial Photography

Purpose

To provide data on annual and peak visitation demand.

Discussion

In order to develop estimates of the total number of visitors, as well as the distribution of visitors on the subject beaches, aerial photographs should be taken of each study segment. These data will allow comparison of beach use at study segments over the course of the 10 data collection days. Therefore, flyovers for aerial photography should occur during the study days between 12:00 noon and 2:00 pm in order to maximize data collection during the probable peak use period.

All images should capture the zone from a point at least 25 meters into the ocean to the first line of vegetation or the first physical structures (e.g. house, motel, hotel, parking lot, swimming pool). Flight altitude for aerial photographs should be determined by a variety of factors, such as weather, camera type and plane type. This ensures that the majority of oceanfront beach users will be visible in the photographs as well as provides a consistent frame of reference for photographic analysis. Altitude may typically range from 500 to 2400 feet. The aerial photographs should also include a 25% overlap for consecutive frames.

All imagery should be taken with high resolution color film, since color information aids in the identification of relevant features. However, as digital imagery increases in resolution, digital photographs may become the medium of choice as this eliminates the conversion

of analog images into digital data for analysis. Additionally, as occlusion of users under umbrellas, beach towels or shelters makes identification and quantification problematic, infrared imagery may serve to increase accuracy of counts.

Analysis of the photographs will consist of both a count of the total number of beach users in the study area, as well as a delineation of the distribution of users between study segments.

Focus Groups

Purpose

To provide data on annual and peak visitation demand and area of influence.

Discussion

Focus groups will be used in order to ascertain the perceptions of a selected group of municipal and county officials and community business leaders from the beach community toward issues related to the study beach area. A focus group is a moderated small group discussion concerning specific issues, ideally comprised of between 6 and 12 participants. The focus group meeting is typically facilitated by a moderator who guides the participants through a planned series of discussions.

It is important that the focus groups follow a prescribed procedure to ensure that the data collected is valid and relevant. The Focus Group Survey Instrument (***Appendix M—Recommended Focus Group Survey Instrument***) and Focus Group Protocol/Discussion Guide (***Appendix N—Recommended Focus Group Protocol/Discussion Guide***) to be utilized with each individual focus group have been developed for this purpose.

Telephone Survey

Purpose

To provide data on annual and peak visitation demand, parking requirements, area of influence, and NED benefits.

Discussion

A telephone survey (***Appendix O—Recommended Telephone Survey Instrument***) should be conducted in order to re-affirm the data collected during the on-site survey and to provide original data regarding latent demand for beach visitation and the associated parking requirements. Specific questions are designed to derive data regarding:

Question Number(s)	Type of Question	Purpose	Conclusions
1, 2, 3, 4, 5, 6, 7, 8, 9	Demographics	Determine user characteristics	Know who beach users are
10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20	Beach visitation patterns	Determine past, present and future beach visitation	Know trends in beach use and how they will be projected into the future

21	Party size	Determine number of people per party and per vehicle	Know how many beach users there are
22	Constraints to visitation	Determine attributes which limit beach visitation	Know factors in latent demand
23, 24	Rating of quality of public parking and access	Determine beach user perceptions of parking and access	Know if quality of public parking and access is adequate
25, 26, 27, 28, 29, 30	Changes in beach visitation patterns given changes in availability of public parking and access	Determine latent demand	Know number of beach users if certain conditions changed
31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42	Beach nourishment	Determine perceptions of beach width, effectiveness of and support for beach nourishment, willingness to pay for beach nourishment, and impacts upon visitation patterns	Know whether beach nourishment is perceived as necessary, and if so, the level of support and financial commitment of beach users

The population to be sampled should be derived from those individuals who could potentially day trip to the study beach. This sampling area will be determined from the on-site survey which provides data about the distance traveled by day users to the study area beach. The delineation of the sampling area will then be based upon those contiguous counties within the radius wherein 70% of the day users reside.

A stratified sampling technique should be utilized which allows for a 95% confidence interval with a margin of error of ± 3%. Continual monitoring of county by county response rates will allow for specific efforts to be made to balance response rates. Such techniques may include call back efforts with additional focus on specific counties to attempt to address those with especially low response rates, or employing alternate survey efforts in those counties, such as making attempts to conduct face-to-face interviews in place of telephone surveys. The latter approach would focus on a ***sub-sample*** of the non-respondents, with an effort made to get information from all subjects selected in the sub-sample.

Secondary Data Review

Purpose

To provide data on annual and peak visitation demand, parking requirements, area of influence, and NED benefits.

Discussion

Secondary data will be congregated in order to assist in the identification of the area of influence, existing and future population centers, transportation systems, recreation activity demand, existing beach recreation facilities and available parking. Analysis of these data will provide insights into trends which may affect annual visitation and peak demand at the subject areas and the associated parking requirements.

The following is a list of specific documents, web-sites and reports which may be reviewed. Additional site-specific documents may be deemed relevant.

1. Statewide Comprehensive Outdoor Recreation Plan (SCORP)

2. State Department of Transportation Master Plan

3. Municipal Public Transportation Documents

4. County Public Transportation Documents

5. Municipal Land-Use Plan

6. County Land-Use Plan

7. Municipal Comprehensive Master Plan

8. County Comprehensive Master Plan

9. Municipal Parks and Recreation Master Plan

10. County Parks and Recreation Master Plan

11. U.S. Census Data

12. State Census Data

13. Chamber of Commerce Visitation Reports

14. Convention and Visitor Bureau Visitation Reports

15. Supplemental documents and reports provided by the U.S. Army Corps of Engineers

Annual Visitation Model

Purpose

To provide data on annual visitation and related benefits.

Discussion

The focus of the telephone survey (*Appendix O—Recommended Telephone Survey Instrument*) is estimation of the benefits of beach quality. The survey collects information that can be used with the CVM and TCM to estimate the benefits of beach width and parking facilities.

Travel Cost Method: Annual Visitation Model

The telephone survey collects revealed preference (RP) and stated preference (SP) data for analysis using the single-site TCM. The single-site TCM estimates a demand curve. The RP data is based on past beach trips that were actually taken. The SP data is based on future trips that would be taken under various hypothetical conditions. The SP data is used to simulate a change in demand from changes in beach quality that can be used to estimate the economic benefits of that change.

The RP and SP trip data is collected for various levels of aggregation for which different demand models can be estimated depending on policy analysis needs (e.g., trips to southeastern North Carolina, Carteret County, and Atlantic Beach). The following describes a demand model for individual beaches within each county -- the most narrow definition of site.

Consider first the single-site TCM demand model with RP data. This model can be used to estimate the economic benefits for a beach trip (not site access) and trips across season. A common functional form for the single-site demand model is the semi-log. The semi-log linear demand model for site j is

$$\ln x_j^{RP} = \phi_0 + \phi_1 p_j + \phi_2 p_k + \phi_3 y + \phi_4 q_j + \mu^{RP}$$

where x_j is the number of trips to site j, p_j is the round trip travel costs to site j, p_k is the round trip travel costs to a substitute site k, y is income, q_j is a vector of site quality variables, the ϕs are coefficients and μ is the error term. Subscripts for individuals in the sample are suppressed for simplicity. Single-site TCM demand models are typically estimated with the Poisson or negative binomial regression models which take into account the fact that recreation trips are integers. See Parsons (2003) and Haab and McConnell (2002) for technical detail.

The economic benefit of a single beach trip is

$$\frac{CS_j}{x_j^{RP}} = \frac{1}{-\phi_1}$$

where CS/x is the consumer surplus per trip. The economic benefit of all trips during the recreation season is

$$CS_j = \frac{x_j^{RP}}{-\phi_1}$$

where CS is the consumer surplus per season. Stated preference trip questions are asked about future trips (1) under status quo conditions, (2) with an improvement in parking conditions (i.e., no time spent searching for a parking spot, reasonable fees, and no change in congestion) and (3) with an increase in beach width (i.e., adding an average of 100 feet to beach width with periodic beach nourishment every 3 to 5 years). The pooled single-site SP TCM demand model is

$$\ln x_{jit}^{SP} = \phi_0 + \phi_1 p_{ji} + \phi_2 p_{ki} + \phi_3 y_i + \phi_4 q_{jt} + \mu_{it}^{SP}$$

where t = 1, 2, 3 are the hypothetical situations described above. Pooling the data requires that panel data methods be used to account for the separate variance across individuals in the sample, i, and scenarios, t.

The economic benefit of a change in trip quality during the recreation season is

$$CS_j(\Delta q) = \frac{\left(x_j^{SP} \mid q_j'\right) - \left(x_j^{SP} \mid q_j^0\right)}{-\phi_1}$$

where $\Delta q = q' - q^0 > 0$ is an improvement in quality (e.g., parking, beach width).

Considering that the SP data is hypothetical, it is potentially subject to the same type of bias that afflicts the willingness to pay responses from the CVM. The currently preferred approach to mitigating this bias is to combine and jointly estimate the RP and SP data. The estimated demand model is

$$\ln x_{jit}^{\lambda} = \phi_0 + \phi_1 p_{ji} + \phi_2 p_{ki} + \phi_3 q_{jt} + \phi_4 y_i + \delta SP + \mu_{it}^{\lambda}$$

where λ = RP, SP and SP = 1 if hypothetical trip data and 0 if actual trip data. The SP variable is included to test for hypothetical bias. A typical result is that $\delta > 0$ where SP trips exceed RP trips. Benefit estimation proceeds as above with, typically, SP = 0. See Whitehead, Haab, and Huang (2000) for technical detail on jointly estimating RP and SP data in the single-site model.

Peak Demand Model

Purpose

To provide data on peak visitation demand, associated parking requirments and related benefits.

Discussion

Travel Cost Method: Peak Demand Model

The TCM demand model described above can be used to generate estimates of annual visitation under current parking and beach conditions and peak visitation. The most reliable estimate of current visitation for each individual is the average of the RP trips at the county, $\overline{x}_j^{RP}$, j = 1, … , 3, and beach, $\overline{x}_k^{RP}$, k = 1, … , 16, level (see appendix for counties and beaches). The estimate of the annual visitation at each county, X_j, or beach, X_k, is the product of the study population (i.e., those who took "oceanfront beach trips to the southeastern North Carolina coast" in 2003), *n*, and the average number of visits at each site:

$$X_j = n \times \overline{x}_j^{RP}$$
$$X_k = n \times \overline{x}_k^{RP}$$

Peak visitation can be estimated three ways, with (a) improved parking (t = 2), (b) wider beaches (t = 3) and (c) improved parking and wider beaches. Quality improvements may lead to two types of changes in visitation: increases in participation and increases in

intensity. The study population includes those who "considered going to an oceanfront beach in North Carolina during the last year." Some of those who considered a trip may not have taken a trip to the southeastern North Carolina coast during the past year. If those who did not take trips in the past year were encouraged to take future trips with the quality improvement the level of participation increases. The study population becomes $n' = n + \Delta n(\Delta q)$, where Δn represents the increased level of participation.

To estimate the change in intensity, consider again the jointly estimated RP-SP single-site TCM demand model with estimated coefficients and mean values of covariates with the status quo beach conditions (t = 1):

$$\hat{x}^o_{jt=1} = \exp\left(\hat{\phi}_0 + \hat{\phi}_1 \bar{p}_j + \hat{\phi}_2 \bar{p}_k + \hat{\phi}_3 \bar{y} + \hat{\phi}_4 q^o_{jt=2} + \hat{\phi}_5 q^o_{jt=3}\right)$$

Where the qs are dummy variables equal to 0 under the status quo, $q^o = 0$, and 1 under the improvement scenario, $q' = 1$ and SP = 0.

Considering individual beaches, j, Predicted individual trips under peak demand alternatives (a), (b), and (c) are:

$$\hat{x}^a_{jt=2} = \exp\left(\hat{\phi}_0 + \hat{\phi}_1 \bar{p}_j + \hat{\phi}_2 \bar{p}_k + \hat{\phi}_3 \bar{y} + \hat{\phi}_4 q'_{jt=2} + \hat{\phi}_5 q^o_{jt=3}\right)$$

$$\hat{x}^b_{jt=3} = \exp\left(\hat{\phi}_0 + \hat{\phi}_1 \bar{p}_j + \hat{\phi}_2 \bar{p}_k + \hat{\phi}_3 \bar{y} + \hat{\phi}_4 q^o_{jt=2} + \hat{\phi}_5 q'_{jt=3}\right)$$

$$\hat{x}^c_{jt=2,3} = \exp\left(\hat{\phi}_0 + \hat{\phi}_1 \bar{p}_j + \hat{\phi}_2 \bar{p}_k + \hat{\phi}_3 \bar{y} + \hat{\phi}_4 q'_{jt=2} + \hat{\phi}_5 q'_{jt=3}\right)$$

Predicted aggregate trips (i.e., peak demand) under peak demand alternatives (a), (b), and (c) are:

$$X^a = n'^a \times \hat{x}^a_{jt=2}$$

$$X^b = n'^b \times \hat{x}^b_{jt=3}$$

$$X^c = n'^c \times \hat{x}^c_{jt=2,3}$$

Similar estimates can be constructed at the county level.

Methodology for Predicting the Associated Parking Requirements

Beach trips at the southeastern North Carolina beaches are constrained by the number of parking and public access spaces. The TCM demand model can be used to forecast the parking needs associated with peak demand. Previous research (Herstine, et al.) has found that public beach parking lots are at capacity during peak beach days (e.g., July 4). Let K_j be public parking capacity (i.e., current number of parking spaces in public lots) at each j beach. The coefficients in the semi-log demand model above approximate the percentage change in trips taken. Therefore, estimates of the additional parking spaces required, ΔK_j, under the various scenarios are

$$\Delta K^a_j = K_j \times \hat{\phi}_4$$

$$\Delta K^b_j = K_j \times \hat{\phi}_5$$

$$\Delta K^c_j = K_j \times \left(\hat{\phi}_4 + \hat{\phi}_5\right)$$

For example, suppose that a beach has K = 500 parking spaces. If $\hat{\phi}_4$ = .10 then the increase in the required number of spaces is 10% of 500, ΔK = 50. The total number of spaces required is K + ΔK (e.g, 500 + 50 = 550). Note that this methodology adopts the assumption that the distribution of trips across j beaches does not change with improved beach conditions. Note also that the standard error associated with the regression coefficients can be used to construct confidence intervals for the estimates of ΔK..

REFERENCES

Allen, G. (1998). Consensus Building. Retrieved December 10, 2003 from http://ollie.dcccd.edu/mgmt1374/book_contents/4directing/concensus/consbldg.htm.

Boyle, K. J. (2003). Contingent valuation in practice. In P. A. Champ, K. J. Boyle, & T. C. Brown, (Eds.), *A primer on nonmarket valuation*. London: Kluwer.

Haab, T. C., & McConnell, K. E. (2002). *Valuing environmental and natural resources: The econometrics of non-market valuation.* Northampton, MA: Edward Elgar.

Isaacs, L. (2003). Shoring up the nation's coastline. *American City and County*, 115(13), 56.

Parsons, G. R. (2003). The travel cost model. In P. A. Champ, K. J. Boyle, & T. C. Brown, (Eds.), *A primer on nonmarket valuation*. London: Kluwer.

United States Army Corps of Engineers, Wilmington District. (2003). Scope of Work: Determination of Recreation Demand For Federal Shore Protection Study Area Bogue Banks, North Carolina.

United States Army Corps of Engineers. (2001, August 17). Engineer Regulation 5-1-11, U.S. Army Corps of Engineers, Business Process.

United States Army Corps of Engineers. (2000, April 22). Engineer Regulation 1105-2-100, U.S. Army Corps of Engineers, Planning Guidance Notebook.

United States Water Resources Council. (1983). Economic and Environmental Principles and Guidelines for Water and Related Land Resources Implementation Studies.

Whitehead, J. C., (2004). Incentive incompatibility and starting-point bias in iterative valuation questions: Reply. *Land Economics, 80*(2), 316-319.

Whitehead, J. C. (2002), Incentive incompatibility and starting-point bias in iterative valuation questions. *Land Economics, 78(*2), 285-297.

Whitehead, J. C., Haab, T. C., & Huang, J. (2000). Measuring recreation benefits of quality improvements with revealed and stated behavior data. *Resource and Energy Economics, 22,* 339-354.

Appendix A: Scope of Work

Scope of Work

Determination of Recreation Demand for Federal Shore Protection Study Area

Bogue Banks, Surf City and North Topsail Beach, Topsail Beach and Brunswick County

Beaches, North Carolina

Introduction

1. *Corps of Engineers Planning Guidance*

    a. Background: The U.S. Army Corps of Engineers is authorized to carry out Civil Works water resources projects for navigation, flood damage reduction and ecosystem restoration, as well as for storm damage prevention, hydroelectric power, recreation, and water supply. Planning for Federal water resources projects constructed by the Corps of Engineers, along with those of the Bureau of Reclamation, Natural Resource Conservation Service, and the Tennessee Valley Authority, is based on the Principles and Guidelines (P & G) adopted by the Water Resources Council. The P & G are comprised of two parts: The Economic and Environmental Principles for Water and Related Land Resources Implementation Studies and The Economic and Environmental Guidelines for Water and Related Land Resources Implementation Studies. The first part is commonly referred to as the principles. The second part, commonly referred to as the guidelines, expands on the concepts introduced in the principles and provides additional information and requirements to conduct water resources planning studies. Together both parts provide the framework for Corps of Engineers water resources planning studies. Within this framework, the Corps seeks to balance economic development and environmental needs as it addresses water resources problems. The planning process shall address the Nation's water resource needs in a system context and explore a full range of alternatives in developing solutions. Innovative solutions and the application of the full range of the Corps programs and authorities are integral to the planning process.

    b. Planning Guidance Notebook: Engineer Regulation (ER) 1105-2-100, *Planning Guidance Notebook*, dated April 22, 2000, found on the Planning References CD, provides the overall direction by which Corps of Engineers Civil Works projects are formulated, evaluated and selected for implementation. It contains a description of the Corps of Engineers planning process, Corps of Engineers missions and programs, specific policies applicable to each mission and program, and analytical requirements. Its fundamental purpose is to describe the planning process in a straightforward, plain-language manner. While that is not always possible in a technical policy document, every effort will be made to make this process understandable not only to planners but to the entire project delivery team, project partners, and the general public. Just as the planning process must reflect reason and common sense, this regulation also shall reflect that same approach. All work completed under the terms of this Scope of Work will adhere to the Planning Guidance Notebook.

2. *Corps Authority for Shore Protection Projects:* U.S. Army Corps of Engineers shore protection projects are formulated to provide hurricane and storm damage reduction. The Corps participates only in those projects formulated exclusively for hurricane and storm damage reduction, and justified based primarily on damage reduction benefits, or a combination of damage reduction benefits plus (at most) a like amount of incidental recreation benefits. In other words, recreation benefits useable to establish Corps participation may not be more that fifty percent of the total benefits required for justification,

which in turn means they may not exceed an amount equal to fifty percent of costs. If the criterion for participation is met, then all recreation benefits are included in the Benefit Cost Ratio (BCR). Costs incurred for other than the damage reduction purpose, i.e. to satisfy recreation demand, are a 100% non-federal responsibility. Recreation is incidental.

3.   *Public Use and its Relation to Federal Participation:*   Federal involvement in shore protection developed historically in a beach context, generally with efforts to stabilize, protect or restore beaches. It was intended that beaches receiving public aid should not provide exclusively private benefits, and therefore, whenever a hurricane and storm damage reduction project involves beach improvements, real estate interest to insure public use of the Federal project is required. Lack of sufficient parking facilities for the general public (including nonresident users) located reasonably near and accessible to the project beaches may constitute a restriction on public access and use, thereby precluding eligibility for Corps participation. Generally, parking on free or reasonable terms should be available within a reasonable walking distance of the beach.

4.   *Recreation Demand:* One of the requirements for Federal shore protection analyses is to develop a projected annual visitation curve and peak hour day user demand for beach areas under study. This information is required for the recreational benefit analyses as well as determining parking and potential transportation requirements for the project area.

5.   *Study Area:* The study areas include the following:

    a.   *Bogue Banks:* The Bogue Banks shoreline protection study area is located in Carteret County, North Carolina. Bogue Banks is a barrier island located between Beaufort Inlet to the east and Bogue Inlet to the west. The study area is approximately 24 miles long. From east to west, the communities on Bogue Banks are Atlantic Beach, Pine Knoll Shores, Salter Path, Indian Beach, and Emerald Isle. Fort Macon State Park is located at the east end adjacent to Beaufort Inlet, and the Theodore Roosevelt Natural Area is located adjacent to Pine Knoll Shores.

    b.   *Surf City and North Topsail:* The Surf City and North Topsail Beach shoreline study area is located in both Pender and Onslow Counties, North Carolina. The Town of North Topsail Beach is located just north of and adjacent to the Town of Surf City. Both towns along with the Town of Topsail Beach are located on Topsail Island, a barrier island about 22 mines long. The Town of North Topsail Beach has approximately 12 miles of oceanfront and Surf City has a little over 5 miles. Of the 12-mile length of North Topsail Beach, the northern 7 miles is located in a Coastal Barrier Resource Act (CBRA) unit.

    c.   *Topsail Beach:* The Topsail Beach shoreline study area is located in Pender County, North Carolina. The Town of Topsail Beach is located just south of and adjacent to the Town of Surf City. The Town of Topsail Beach is located on the southern 5 miles of Topsail Island.

    d.   *Brunswick County Beaches:* The Brunswick County Beaches shoreline protection study area is located in southeastern North Carolina between the Cape Fear River and Shallotte Inlet. The study area is approximately 21 miles long. From east to west, the communities of Caswell Beach, Oak Island, and Holden Beach make up the study area. Fort Caswell is located at the east end adjacent to the Cape Fear River, and Lockwoods Folly Inlet is located between Oak Island and Holden Beach.

Part A: Development of Methodology and Sampling Plan

1.   *Methodology for Predicting Annual and Peak Visitation:* The Contractor shall develop a methodology for predicting annual and peak visitation at the subject beaches and parking requirements to handle projected visitation.   The methodology will be generic and applicable to all shore protection projects. It will include a procedure to identify the area of

influence (source of visitation) and a procedure to project visitation demand from the area of influence. The methodology shall include identification of existing and future population centers, transportation systems, recreation activity demand, existing beach recreation facilities, and available parking. The contractor shall prepare a plan and detailed description of how each element of the methodology is conducted.

2.   *Methodology to Determine National Economic Development Benefits:*   The contractor shall evaluate and recommend one of the three approved evaluation methods described in ER1105-2-100 Planning Guidance, Appendix E, Section VII – Recreation. They are the travel cost method (TCM), contingent valuation method (CVM), and the unit day value (UDV) method. The selection criteria are summarized in Figure E-10 in ER1105-2-100, Appendix E. The contractor shall develop a survey instrument to collect appropriate data to support the recommended evaluation method.   The contractor is not required to determine NED benefits for the without project conditions for any of the beaches but shall provide data which the Corps of Engineers can use to perform the NED analysis.

3.   *Sampling Plan:*   The contractor shall prepare a sampling plan which (1) details how information will be collected; (2) details how survey days will be selected and alternatives, if for any reason survey cannot be conducted on any selected survey days; (3) established the times of day for sampling an interviewing; (4) details how the area of influence and beach goers will be selected and who shall be interviewed; and (5) presents what measures will be taken to assure that the survey results are a representative sample of potential recreational beach users. The sampling plan shall identify the sampling points selected within each of the Recreation User Segments described in paragraph 5b. The contractor shall judgmentally select sampling points. There shall be at least one sampling point for each Recreation User Segment. The survey instrument(s) to be used in this study shall be included in the sampling plan along with a narrative description on how the instrument(s) will be administered and a narrative description of the methodology proposed to be used to conduct the survey. The rationale for selection of peak user days, sampling points, survey instrument(s), and methodology used to conduct the survey shall be documented and references cited, as appropriate. The contractor shall submit this sampling plan to the Contracting Officer for review and approval. The Contracting Officer reserves the right to request changes to the sampling plan submitted. If the Contracting Officer provides review comments on the plan to the Contractor, the Contractor shall have seven (7) days to address the comments and return a revised plan to the Contracting Officer for approval.

   a.   *Selection of Peak Use Days:* The Contractor will select 5 peak days during the summer season (Memorial Day, 26 May 2003 until Labor Day September 2003). The peak days may be selected, in part, based on historic visitation data, if available. Potential sources of historic visitation include: (1) traffic counts, (2) visitation data from Ft. Macon State Park and the North Carolina Aquarium at Pine Knoll Shores; and (3) visitation records which <u>may</u> be available from local governments. The Contractor shall consider the following during the selection of peak user days: (1) if the selected day is a holiday; (2) is the weather conditions are optimal for beach recreation on the selected day; and (3) if the selected day falls on a weekend. The Contractor shall select peak user days judgmentally. Peak user days do not necessarily need to be the same day for each beach surveyed. The Contractor may, at their discretion select alternate days for each beach to lessen the number of crews in the field at any given time.   The Contractor shall take into consideration conditions which may affect visitation. Conditions which may affect visitation include but are not limited to: (1) bad weather; and (2) catastrophic local, state, national or international events.

   b.   *Data Collection Instruments:* Any set of questions asked by the U.S. Army Corps of Engineers of 10 or more respondents outside the Federal Government must originate from Office of Management and Budget (OMB)-approved questions.   A CD is included with this Scope of Work which contains several approved questionnaires

(Attachment 1). Terms of Clearance for these questionnaires can be found as Terms of Clearance.jpg on the CD found at Attachment 1. If the Contractor proposes to use a non-approved questionnaire, the questionnaire must be approved by OMB prior to undertaking the survey. The Wilmington District is responsible for coordinating the approval with OMB. The Contractor will be notified in writing by the Contracting Officer when a specific questionnaire is approved. The approval process "normally" takes 30 days.

c. *Selection of Data Collection Locations:* Each of the above described beach projects will be broken down into Recreation User Segments. The Recreation User Segments for Bogue Banks shall be: (1) Atlantic Beach; (2) Pine Knoll Shores; (3) Salter Path/Indian Beach; and (4) Emerald Isle. The Recreation User Segments for North Topsail Beach/Surf City are: (1) Surf City; (2) North Topsail Beach (west of town hall); and (3) North Topsail Beach (east of town hall). The Recreation User Segments for Brunswick County Beaches are: (1) Holden Beach; (2) Oak Island (west of Turtle Habitat Restoration Project; (3) the Turtle Habitat Restoration Project Area; (4) Oak Island (east of Turtle Habitat Restoration Project including area previously known as Yaupon Beach); and (5) Caswell Beach. Topsail Beach does not need to be broken down into Recreation User Segments. Topsail Beach will be considered as a single unit. The Contractor shall determine the location and number of specific sampling locations for each Recreation User Segment. Justification shall be provided in support of the Contractor's choice of location and the number of sampling points chosen for each Recreation Use Segment. This information including all documentation in support of the choice of location shall be included in the sampling plan.

Part B: Implementation of Survey and Report Preparation

1. *Exercising Part B:* Upon review and approval of the sampling plan required by Part A: Scope of Work (including approval by OMB of any questionnaires proposed for use during the survey) the Contracting Officer, solely at their discretion, may exercise Part B: Scope of Work. If the Contracting Officer exercises Part B, the Contractor shall be required to perform the following tasks.

2. *Field Data Collection:* The Contractor shall collect data on peak hour day user demand and annual recreational demand for each of the Recreation User Segments described in the approved sampling plan for Bogue Banks, North Topsail Beach/Surf City, Topsail Beach and Brunswick County Beaches. The methodology used to collect this data, will include, but not necessarily limited to, telephone interviews, questionnaires, and interviews at specific beach locations on peak user days. In addition, field data collection shall be undertaken one-day prior or one day following the selected peak day.

3. *Data Analysis:* Data shall be analyzed separately for each Recreation User Segment. Peak hour day user demand and annual recreational demand analysis shall include descriptive statistics (e.g. averages, percentages, medians) in table, chart or graphic format suitable for easy public presentation and inclusion in planning documents. Graphic documentation shall to the maximum extent possible be presented in GIS format. All analyses shall be fully documented and described so that the readers of the report can understand both how the analysis was accomplished and how the results were interpreted. All databases, spreadsheets, and other computer-generated data shall be provided. Field Data Reports for peak hour demand survey and annual use survey shall be provided as they are completed. Field Data Reports shall be provided in the following order: Bogue Banks, Brunswick County Beaches, North Topsail/Surf City, and Topsail Beach.

4. *Report Preparation:* Upon completion of all work tasks, the Contractor shall submit a draft report for review. The report and findings shall be objective and fully substantiated by documentation. For formal scientific investigations, the report shall follow the format

required by reputable scientific periodicals, including abstract, summary, introduction, methods, results, discussion, conclusions and recommendations, references, and appendices. The appendices will contain tabulations of all statistical data and a list of all participating technical staff and their respective responsibilities on the project. The report shall contain appropriate summary tables and figures. Text material shall be typed or printed with a letter quality printer (dot matrix printing is not acceptable) on 8-1/2 " by 11" bond paper with 1-1/2" margins on the left for binding. All pages must be consecutively numbered. Drawings or plates bound in the report shall be no larger than 11" by 17" and shall include a graphic bar scale for control during reduction or enlargement. **Draft reports requiring extensive proofreading or incomplete draft reports will be returned to the Contractor as unacceptable.** The Contracting Officer will provide written comments on the accepted draft report. The Contractor will revise the report in accordance with these comments and, then, submit the report as final.

Appendix B: On-Site Survey Instrument

Hello, I'm_____ from the University of North Carolina Wilmington and we are conducting a Beach Access study for this beach. Your participation in this survey is entirely voluntary and will likely take less than five minutes. All answers will be kept confidential. Would you be willing to answer a few questions?

Date of Interview: _____ Starting Time: _____

Interview Location (Section):_____

1. Are you 18 years of age or older?
   a. Yes
   b. No (TERMINATE INTERVIEW)

2. How many people are in your party today? _____ people

3. Are you:
   a. A resident of this beach town/community
   b. A day user who did not spend the night in or around this beach town/community
   c. An overnight visitor
      ►How many days will you spend at this beach on this trip? _____ days

4. How far did you travel to the beach today (one way)? _____ (distance in MILES)

5. What kind of transportation did you use to get to the beach today?
   a. Car/van
      ►How many people in your vehicle today? _____
      ►Where did you park?
         a. Side street
         b. Public parking lot
         c. Other (SPECIFY _____)
      ►How long did it take you to find a parking spot? _____
      ►Did you have to pay for the parking? _____ Yes _____ No
         If Yes, how much _____
   b. Bicycle
   c. Walk
   d. Other (SPECIFY _____)

6. How would you rate the availability of public parking near this beach? Would you say it is:
   a. Excellent
   b. Good
   c. Fair
   d. Poor
   e. No response given

7. How many minutes did it take to walk from your parking spot to the beach? _____ minutes

8. What time did you and your party arrive on the beach for the first time today?
   _____ am/pm

9. What time will you leave the beach today?
   _____ am/pm

10. During the current year, do you plan to visit this beach _____ the previous year?
    a. More often than
    b. The same as
    c. Less often than
    d. Didn't come to this beach last year

11. How important are each of the following in affecting the quality of your beach experience, with 1 being <u>Very Important</u> and 4 being <u>Unimportant</u>?

          1= Very important   2= Important   3=Not very important   4=Unimportant

Availability of public parking	1	2	3	4
Parking within ¼ mile of the beach	1	2	3	4
Free parking 1	2	3	4	
Restroom facilities	1	2	3	4
Shower facilities	1	2	3	4
Concessions 1	2	3	4	
Handicapped accessibility	1	2	3	4

12. If there was more public parking, would you make more trips to the beach?
   a. Yes
   b. No

13. Why did you choose this beach rather than another beach for this trip?

14. Some beach trips cost more than others. For example, on an overnight beach trip you may spend money for food, travel expenses, and lodging. On a day trip you may only spend money for gas. What do you expect will be <u>your</u> total expenses <u>as an individual</u> for this beach trip?
   a. $ _____.00　　　　　　　　c. Don't know
   b. Refused　　　　　　　　　　d. N/A (Live in beach town/community)

15. Beach trip costs change over time. For example, gas prices fell during the 1990s and rose during the first part of 2003. Would you have come to this island for your beach trip if your total trip costs were **[$A*: $5, $10, $25, $50, or $75]** more than the amount you just reported?
   a. Yes　　　　　　　　　　　d. Don't know
   b. No　　　　　　　　　　　　e. N/A (Live in beach town/community)
   c. Refused

Each survey receives a sequentially assigned value for $A. Choose from $5, $10, $25, 50, or $75 and <u>circle the cost</u>.

16. What is the highest amount you would pay for a beach trip to this island before cost influenced you to choose another island destination?
   a. $ _____.00　　　　　　　　c. Don't know
   b. Refused　　　　　　　　　　d. N/A (Live in beach town/community)

17. If cost were a factor, which of the following statements best describes what you would do instead of taking the current beach trip to this island?
   a. I would not leave home
   b. I would take a trip to a beach closer to my home
   c. I would take a different type of trip
   d. Some other reason (SPECIFY_____)

18. What was your total gross <u>household</u> income for 2002? Please indicate when we reach your range.
   a. Less than $20,000　　　　　　e. $80,000 to $99,999
   b. $20,000 to $39,999　　　　　f. $100,000 or more
   c. $40,000 to $59,999　　　　　g. ___Refused
   d. $60,000 to $79,999　　　　　h. ___Don't know

19. What is the zip code at your permanent home? __ __ __ __ __

20. Do you have any other thoughts you would like to share regarding access and parking on this beach?

Thank you very much for your time.

Record: 1 - Male 2 - Female　　　　　　　　Completion Time: _____

# Guidelines for Weather Related
Conditions and Cancellations

1) It is the responsibility of the study area coordinator to check and accurately record the weather conditions the evening before commencement of data collection at the study area, 2 hours immediately prior to the daily commencement of data collection at the study area, and, at 10:00 am the day of the data collection . The coordinator is also responsible for recording the weather conditions at her/his individual study area periodically as each survey day progresses—preferably on an hourly basis.

2) If the weather forecast calls for prolonged inclement weather lasting more than three (3) hours between the hours of 10:00 am and 4:00 pm, the coordinator will cancel the study day and reschedule.

3) If there is a large front and continuous band of storms moving through an area of study between the hours of 10:00 am and 4:00 pm, the coordinator must determine whether or not the survey day will be a success for her/his individual study area, despite the inclement weather. Periodic showers and thunderstorms will not terminate a data collection event. The coordinator will "wait out" such periodic storm events and resume data collection after the storm event has passed. Parking counts must continue to be made even during periodic storm events. However, if the storm persists for more than two (2) hours, the coordinator will cancel the study day. The study day will be rescheduled if the coordinator must cancel the data collection event prior to the parking counts "peaking" (i.e. the point where the number of available parking spaces begins to decrease rather than increase).

4) If a storm passes through the study area, the coordinator must wait it out to see if there is any continued bad weather "behind" it. The coordinator should expect and be prepared for periodic rain showers and thunderstorms during the data collection days. If rain and/or storms do come into a coordinator's individual study area, the coordinator can pick up his/her data collectors and assemble either in cars, or at a local restaurant, business, shelter, etc. to wait out the inclement weather. Every attempt will be made to safely complete each survey day.

5) To determine a successful survey day once data collection has begun, the data must show that the parking space count has peaked and begun to level off at a similar level to that of the morning counts. (Think of a bell curve – in the morning there will be numerous open spaces and as the day progresses, there will be fewer spaces available. When the spaces begin to open up again, the day has reached its "peak."). It is the coordinator's responsibility to review parking count results as they are completed.

Appendix D: Summary of Study Weather Conditions

Date	Island	Weather
July 4, 2003	Bogue Banks	Sunny
	Topsail Island	Sunny
	Brunswick County Beaches	Sunny
July 5, 2003	Bogue Banks	Sunny
	Topsail Island	Partly Cloudy
	Brunswick County Beaches	Sunny
July 12, 2003	Bogue Banks	Light Rain
	Topsail Island	Heavy Rain & Thunder
	Brunswick County Beaches	Heavy Rain in A.M. & Partly Cloudy in P.M.
July 13, 2003	Bogue Banks	Light Rain
	Topsail Island	Light Rain & Partly Cloudy
	Brunswick County Beaches	Cloudy in A.M. & Partly Cloudy in P.M.
July 19, 2003	Bogue Banks	Light Rain in A.M. & Heavy Rain in P.M.
	Topsail Island	Heavy Rain – Study Day Rescheduled
	Brunswick County Beaches	Heavy Rain in A.M. & Partly Cloudy in P.M.
July 20, 2003	Bogue Banks	Sunny
	Topsail Island	Rescheduled
	Brunswick County Beaches	Sunny
August 2, 2003	Bogue Banks	Light Rain in A.M. & Cloudy in P.M
	Topsail Island	Light Rain & Partly Cloudy
	Brunswick County Beaches	Cloudy in A.M. & Sunny in P.M.
August 3, 2003	Bogue Banks	Light Rain in A.M. & Sunny in P.M.
	Topsail Island	Light Rain & Cloudy
	Brunswick County Beaches	Partly Cloudy in A.M. & Sunny in P.M.
August 9, 2003	Topsail Island only (make-up for July 19)	Rain & Partly Cloudy
August 10, 2003	Topsail Island only (make-up for July 19)	Rain & Partly Cloudy
August 30, 2003	Bogue Banks	Sunny
	Topsail Island	Sunny
	Brunswick County Beaches	Sunny
August 31, 2003	Bogue Banks	Sunny
	Topsail Island	Sunny
	Brunswick County Beaches	Sunny

Appendix E: Study Segments

Bogue Banks
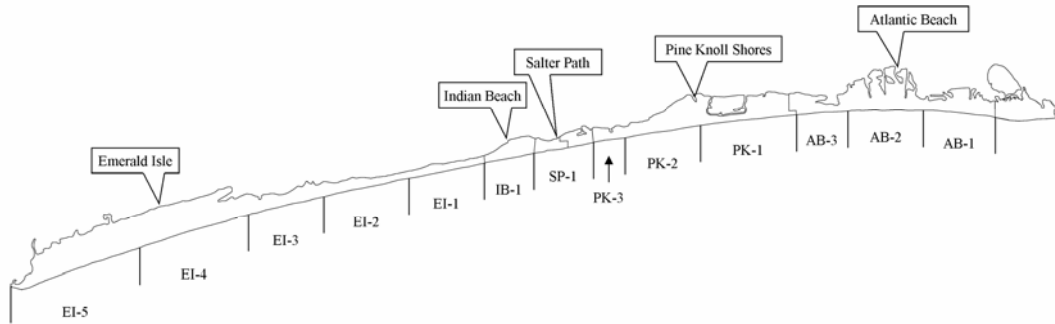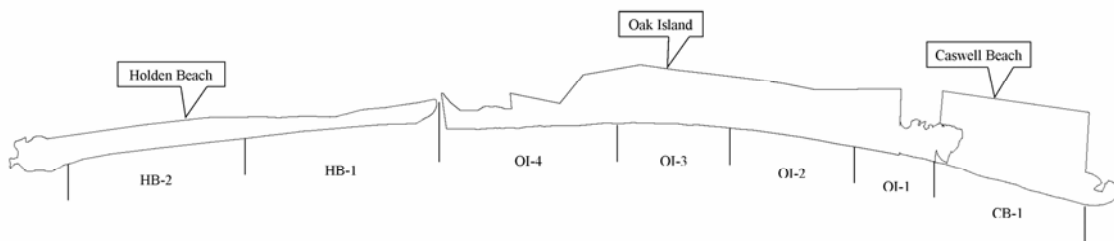

Topsail Island
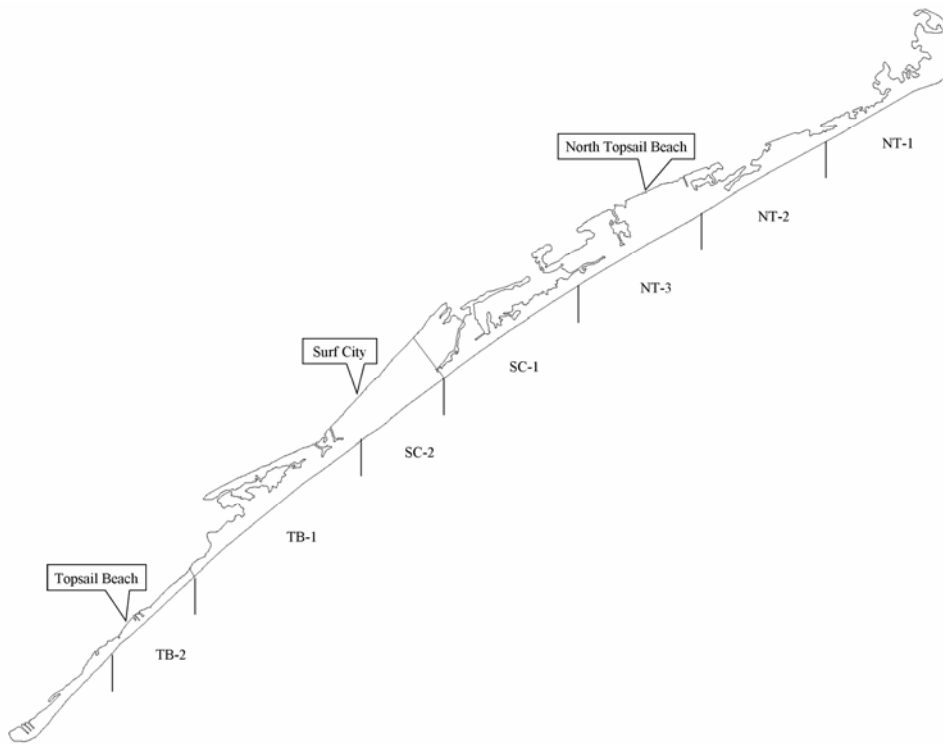
Brunswick County Beaches

Appendix F: Parking Space Count Instrument

Beach: _____   **Date:** _____
Parking Lot: _____   **# of Handicapped Spaces:** _____
Total # of Spaces: _____

Time	Total No. of Open Spaces	Total No. of "Creative"
9:		
10:		
11:		
12:		
1:		
2:		
3:		
4:		

Appendix G: Focus Group Survey Instrument

Focus Group Survey

Thank you for attending today's focus group regarding public beach access and parking at (insert name of community here). We would appreciate your response to the following questions to begin this evening's process. Your responses are confidential and will not be used in conjunction with your name. When responding, please answer according to your peak beach season. For purposes of this survey, peak season can be defined as Memorial Day through Labor Day.

Date: _____   Are you a: Municipal Official? ☐   Business Leader? ☐

1. Are you:
   a. A resident of the beach town/community that you are here representing today
   b. A resident of another town/community
      _____(Please Specify)

2. Using your best estimate, what percentage of your community's oceanfront beach users are: (percentages should equal 100%)
   a. Residents (individuals giving their primary residence as that of your beach community) of this beach town/community?
      _____%
   b. Day users (individuals visiting your beach community for a day trip and returning home the same day)?
      _____%
   c. Overnight visitors (individuals spending at least one night at your beach and who did not report your beach as their primary residence)?
      _____%

3. How far do you believe each of the following types of typical oceanfront beach users travel on average to reach your beach community (**one way** from their primary residence)?
   a. Day user: _____ miles
   b. Overnight visitor: _____ miles

4. What do you believe is the average length of stay for the average oceanfront beach user at your community's beaches during an average day?
      _____ hours

5. During the last beach season, did your community experience _____ ?
   a. More beach visits than in previous years
   b. Approximately the same number of beach visits as in previous years
   c. Fewer beach visits than in previous years

6. In your opinion, how important are each of the following in affecting the quality of the average oceanfront beach user's experience at your community's beaches? (Please circle one number for each question)

   1= Very important   2= Important   3=Not very important   4=Unimportant

q6a. Availability of public parking	1	2	3	4
q6b. Parking within ¼ mile of the beach	1	2	3	4
q6c. Free parking	1	2	3	4
q6d. Restroom facilities	1	2	3	4
q6e. Shower facilities	1	2	3	4
q6f. Concessions	1	2	3	4
q6g. Handicapped accessibility	1	2	3	4

7. How do you believe the average oceanfront beach user would you rate the availability of public parking near your community's beaches?
   a. Excellent
   b. Good
   c. Fair
   d. Poor

8. How long do you believe it takes the average oceanfront beach user to find a parking spot at your community's beaches?
   _____ minutes

9. What percentage of oceanfront beach users do you believe paid to park?
   _____%

10. If there was more public parking, do you believe the average oceanfront beach day user would make more trips to your community's beaches?
    a. Yes(Please estimate the number of additional trips per year per user: _____ trips)
    b. No

11. How do you believe the average oceanfront beach user would you rate the availability of beach access for the public at your community's oceanfront beaches?
    a. Excellent
    b. Good
    c. Fair
    d. Poor

12. How many minutes do you believe it takes the average oceanfront beach user to walk from their parking spot to get to your community's beaches?
    _____ minutes

13. Do you think people would make more beach trips to your beach communities if public oceanfront beach access was improved?
    a. Yes (Please estimate the number of additional trips per year per user: _____ trips)
    b. No

14. Some beach trips cost more than others. For example, an overnight oceanfront beach trip may include money for food, travel expenses and lodging. On a day trip a visitor may only spend money for gas. What do you believe is the average total expense for the typical beach user who visits your community's beaches?
    a. $_____.00 (Day User)
    b. $_____.00 (Overnight Visitor)

15. What is the highest amount you believe the typical oceanfront beach user would pay for a beach trip to this beach community before cost influenced the user to choose another beach destination?
    a. $_____.00 (Day User)
    b. $_____.00 (Overnight Visitor)

16. Some people take fewer oceanfront beach trips than they would like to take. Which of the following reasons limits the number of oceanfront beach trips that people take to your community's beaches? (PLEASE CIRCLE ALL THAT APPLY)
    a. Lack of time?
    b. Lack of money?
    c. Lack of sufficient shower facilities?
    d. Lack of sufficient restrooms?
    e. Lack of sufficient concessions?
    f. Lack of sufficient disability parking?

g. Lack of dry sand beach area?
h. Lack of sufficient parking facilities?
i. Lack of sufficient access facilities?

17. On average, how wide would you estimate your community's oceanfront beaches are, based on the width of the dry sand beach at high tide?

_____ feet

18. How do you believe the typical beach user would you rate the current width of your community's oceanfront beaches?
   a. Excellent
   b. Good
   c. Fair
   d. Poor

19. If you did not choose "excellent" in question 18, what would the average width of your community's beach need to be in order for your oceanfront beach users to rate it as excellent?

_____ feet

20. What would you estimate the average width of your community's oceanfront beach would need to be in order to accommodate the maximum number of visitors you could receive?

_____ feet

21. Some local communities collect revenue by charging users to park when they visit the oceanfront beach. What is your opinion on charging the public a fee to park?
   a. Strongly support
   b. Support
   c. Oppose (Please Explain_____)
   d. Strongly oppose (Please Explain_____)

22. If charging the public an annual fee to park were mandatory, how much do you believe oceanfront beach day users would be willing to pay for an annual permit to park in public parking?

$_____.00

23. What do you believe was the gross household income in 2003 for the average resident at your community's beaches?
   a. Less than $20,000   d. $60,000 to $79,999
   b. $20,000 to $39,999   e. $80,000 to $99,999
   c. $40,000 to $59,999   f. $100,000 or more

24. What do you believe was the gross household income in 2003 for the average day user at your community's beaches?
   a. Less than $20,000   d. $60,000 to $79,999
   b. $20,000 to $39,999   e. $80,000 to $99,999
   c. $40,000 to $59,999   f. $100,000 or more

25. What do you believe was the gross household income in 2003 for the average overnight visitor at your community's beaches?
   a. Less than $20,000   d. $60,000 to $79,999
   b. $20,000 to $39,999   e. $80,000 to $99,999
   c. $40,000 to $59,999   f. $100,000 or more

This concludes the survey. Thank you very much for your time.

Focus Group Discussion Guide
Parking and Oceanfront Beach Access
May/June, 2004

Municipal Officials and Business Leaders

I.   Introduction

    A.   Welcome

- My name is Jennifer Rader. I am the President of Jennifer Rader and Company Inc., and I have been contracted by researchers at the University of North Carolina Wilmington to facilitate a focus group discussion regarding beach parking and oceanfront beach access at your beaches in relation to beach nourishment.
- I will also administer a short survey
- Thank you for joining me today.

    B.   Purpose

- Your input in today's survey and discussion is very important
- UNCW would like to find out how you, the municipal officials and business leaders of _____ _____ (*specify exact beach community)* perceive beach parking and oceanfront beach access.
- As community leaders, what you tell us today will help UNCW understand beach parking and oceanfront beach access needs in your community from your perspective.
- You are one of 11 beach communities participating in this project.
- You'll be here for about an hour to an hour and a half.

    C   Self-Introduction

- Ask each participant to introduce him/herself and tell the other participants about his/her occupation and experience in _____ (*specify exact beach community)*

    D.   Procedure
- I will incorporate your thoughts and suggestions into a final report that will be submitted to UNCW.
- UNCW is interested in all of your ideas, comments and suggestions and there are no right or wrong answers. All comments, both positive and negative are welcome.
- Feel free to disagree with one another, as this is a discussion.
- I would prefer that only one person speak at a time since I am interested in what everyone has to say.
- We will try to keep this discussion under an hour so we will move through the questions in a timely fashion. I may have to end a discussion and move on to another topic so please don't be offended.
- Please remember that I am a neutral party.

    E.   Need to explain about the note taker and tape recorder.

II.   Focus Group Discussion: Survey Instrument

    A.   Need to introduce, explain and administer the focus group survey. Individuals have 15 minutes to complete. Note that when asked on the survey, they need to answer from the "users" perspective.

III. Focus Group Discussion: Introduction

    A. What do you think are the best features of your beach? Why would the public choose to visit yours over the competition?

    B. Is your community interested in attracting more visitors during the peak season and what role does parking and beach access play in limiting or attracting visitors?

    C. What are the barriers, if any, to attracting more visitors?

IV. Focus Group Discussion: Verification of Categories

    A. When you think about the people who use your beach, do you have a particular way of categorizing them? *For example, as you read in the survey, UNCW categorized users into three groups: Day Users, Overnight Users and Resident Users.* Do you think this an accurate way to categorize people who visit your beach, or do you have other definitions that you prefer to use? (prompt to see if business owners/town managers have different definitions)

V. Focus Group Discussion: Oceanfront Beach Access

    A. How adequate is oceanfront beach access in your community?
        • Can day users find them easily?

    B. If not, what are the challenges and obstacles to having limited access? If there are challenges, what have you done or what do you plan to do to alleviate the problem? If you cannot fix the problem, please tell me why.

    C. If your oceanfront beach access <u>is</u> adequate, please tell me why.

VI. Focus Group Discussion: Parking

    A. Tell me about public parking in your beach community. How adequate is public parking during the "peak" season?
        • Is parking easy to find? Why or why not?
        • Do you have adequate parking close to a beach access? If it is adequate why? If it is not, why?

    B. If you do not feel you have an adequate number of parking spaces during the "peak season," what are the challenges and obstacles to fixing this problem? If parking has been a problem during peak season, explain what has your community has done or not done to fix the problem? Why?

VII. Focus Group Discussion: Parking/Access Fee

    A. Some local beach communities collect revenue by charging users to park when they visit the beach. What is your opinion on charging the public a fee to park?

    B. What groups of people would you consider it appropriate to charge a fee? Overnight users? Day users? Residents?

VIII. Closing

    A. Are there any more thoughts on the discussion?
    B. Thank you and goodnight

Appendix I: Telephone Survey Instrument

Jim Herstine, Jeff Hill, Bob Buerger, John Whitehead and Carla Isom
UNC Wilmington

Hello, I'm from the University of North Carolina Wilmington and my name is _____. I am calling to ask some questions on behalf of the U.S. Army Corps of Engineers about your use of oceanfront beaches in North Carolina. This is part of an important research study to determine the adequacy of public access, public parking and citizen's perceptions of beach nourishment projects at the oceanfront beaches in North Carolina. Your participation in this study is entirely voluntary and all of your responses will be confidential. You may refuse to participate or you may stop participating at any time without adverse effects. The survey will only take about 10 – 15 minutes.

The Office of Management and Budget Control (OMB) number for this study is OMB-710-0001.

Are you at least 18 years old?
_____Yes—Ask: Are you willing to answer a few general questions about the number of trips you take to the oceanfront beaches in North Carolina?
_____Yes—Proceed to Q1_____No—terminate the interview and thank the individual
_____No—Ask if there is someone in the house at least 18 years of age that you can speak to. If yes, ask to speak to that individual and begin from above—"Hello, I'm………." If no, terminate the interview and thank the individual.

Q1. Have you considered going to an oceanfront beach in North Carolina during the last year?
_____Yes → go to Q2
_____No → This concludes our interview. Thank you very much for participating!

Q2. Did you actually take any oceanfront beach trips to the North Carolina coast in 2003?
_____Yes → go to Q3
_____No → go to Q21

Q3. How many oceanfront beach trips to the North Carolina coast did you take in 2003?

_____ Trips (Number of trips, not percentage)

Q4. How many of these oceanfront beach trips were day trips, where you returned to your home on the same day that you left?
_____ Trips (Number of trips, not percentage)

Q5. How many of your oceanfront beach trips were to the southeastern North Carolina coast from the Beaufort/Morehead City area in Carteret County to the South Carolina border?
_____ Trips (Number of trips, not percentage)

If 0, go to Q21

Q6. There are five counties along the southeastern North Carolina coast: Carteret, Onslow, Pender, New Hanover, and Brunswick. To the best of your knowledge, how many of your oceanfront beach trips were to Carteret County?
_____ Trips (Number of trips, not percentage) → if more than 0, go to Q7

If 0, go to Q9

Q7. How many of these trips to Carteret County were day trips?
_____ Trips (Number of trips, not percentage) → go to Q8

Q8. How many of your oceanfront beach trips to Carteret County were to:
   a. Fort Macon State Park?   _____ Trips (Number of trips, not percentage)
   b. Atlantic Beach?   _____ Trips (Number of trips, not percentage)
   c. Pine Knoll Shores?   _____ Trips (Number of trips, not percentage)
   d. Salter Path or Indian Beach? _____ Trips (Number of trips, not percentage)

 e. Emerald Isle?   _____ Trips (Number of trips, not percentage)
 f. Other beach locations in Carteret County? _____ Trips (Number of trips, not percentage)
   (Please specify)_____

Q9. How many of your oceanfront beach trips were to Onslow County or Pender County?
_____ Trips (Number of trips, not percentage) → if more than 0, go to Q10

If 0, go to Q12

Q10. How many of these trips to Onslow County or Pender County were day trips?
_____ Trips (Number of trips, not percentage) → go to Q11

Q11. How many of your oceanfront beach trips to Onslow County or Pender County were to:
 a. North Topsail Beach?   _____ Trips (Number of trips, not percentage)
 b. Surf City?   _____ Trips (Number of trips, not percentage)
 c. Town of Topsail Beach? _____ Trips (Number of trips, not percentage)
 d. Other beach locations in Onslow County or Pender County? _____ Trips (Number of trips,
   not percentage) (Please specify)_____

Q12. How many of your oceanfront beach trips were to New Hanover County?
_____ Trips (Number of trips, not percentage) → if more than 0, go to Q13

If 0, go to Q 15

Q13. How many of these trips to New Hanover County were day trips?
_____ Trips (Number of trips, not percentage) → go to Q14

Q14. How many of your oceanfront beach trips to New Hanover County were to:
 a. Wrightsville Beach?   _____ Trips (Number of trips, not percentage)
 b. Masonboro Island?   _____ Trips (Number of trips, not percentage)
 c. Carolina Beach?   _____ Trips (Number of trips, not percentage)
 d. Kure Beach?   _____ Trips (Number of trips, not percentage)
 e. Fort Fisher?   _____ Trips (Number of trips, not percentage)
 e. Other beach locations in New Hanover County? _____ Trips (Number of trips, not
   percentage) (Please specify) _____

Q15. How many of your oceanfront beach trips were to Brunswick County?
_____ Trips (Number of trips, not percentage) → if more than 0, go to Q16

If 0, go to Q 18

Q16. How many of these trips to Brunswick County were day trips?
_____ Trips (Number of trips, not percentage) → go to Q17

Q17. How many of your oceanfront beach trips to Brunswick County were to:
 a. Caswell Beach?   _____ Trips (Number of trips, not percentage)
 b. Oak Island (Formerly Long Beach and Yaupon Beach)? _____ Trips (Number of trips, not percentage)
 c. Holden Beach?   _____ Trips (Number of trips, not percentage)
 d. Ocean Isle Beach?   _____ Trips (Number of trips, not percentage)
 e. Sunset Beach?   _____ Trips (Number of trips, not percentage)
 f. Other beach locations in Brunswick County?   _____Trips (Number of trips, not percentage)
   (Please specify) _____

Q18. Was 2003 a typical year in terms of your oceanfront beach trips to the North Carolina coast from the Beaufort/Morehead City area to the South Carolina border?
_____Yes → go to Q20
_____No → go to Q19

Q19. Do you typically take more or fewer oceanfront beach trips to the North Carolina coast from the Beaufort/Morehead City area to the South Carolina border in a typical year?
_____More
_____Fewer

Q20. Do you plan to take at least one oceanfront beach trip to the North Carolina coast from the Beaufort/Morehead City area to the South Carolina border during 2004?

_____Yes

_____No → go to Q23

Q21. As best as you can predict, how many oceanfront beach trips to the North Carolina coast do you plan to take during 2004?

_____Trips (Number of trips, not percentage) → go to Q22

If 0, go to Q23

Q22. How many of these oceanfront beach trips do you plan to take to the North Carolina coast from the Beaufort/Morehead City area to the South Carolina border?

_____ Trips (Number of trips, not percentage)

Q23. Some people take fewer oceanfront beach trips than they would like to take. Which of the following reasons limits the number of beach trips that you take? Answer all that apply.

a.	Lack of time?	_____Yes	_____No
b.	Lack of money?	_____Yes	_____No
c.	Lack of sufficient shower facilities?	_____Yes	_____No
d.	Lack of sufficient restrooms?	_____Yes	_____No
e.	Lack of sufficient concessions?	_____Yes	_____No
f.	Lack of sufficient disability parking?	_____Yes	_____No
g.	Lack of dry sand beach area?	_____Yes	_____No
h.	Lack of sufficient parking facilities?	_____Yes	_____No
i.	Lack of sufficient access facilities?	_____Yes	_____No
j.	Congestion at the beach itself?	_____Yes	_____No
k.	Congestion on the roads leading to the beach?	_____Yes	_____No
l.	Other (please specify) _____	_____Yes	_____No

Q24. In general, would you say that current parking facilities at southeastern North Carolina oceanfront beaches are excellent, good, fair, or poor?

a.   ___Excellent

b.   ___Good

c.   ___Fair

d.   ___Poor

Q25. In general, would you say that current beach access at southeastern North Carolina oceanfront beaches is excellent, good, fair, or poor?

a.   ___Excellent

b.   ___Good

c.   ___Fair

d.   ___Poor

Q26. Suppose that parking facilities and beach access at southeastern North Carolina oceanfront beaches were improved so that you would not have to spend time searching for a parking space or access area, the parking space and access area would be located within reasonable walking distance of the oceanfront beach, and parking was free or reasonably priced. Also suppose that the number of beach users at the oceanfront beaches does not change. Would you say that improved parking conditions at southeastern North Carolina oceanfront beaches would be excellent, good, fair, or poor?

a.   ___Excellent

b.   ___Good

c.   ___Fair

d.   ___Poor

Q27. Compared to the number of oceanfront beach trips that you plan to take to the North Carolina coast from the Beaufort/Morehead City area to the South Carolina border during 2004, would you take more trips, fewer trips, or the same number of trips with improved parking facilities and access areas?

_____More → go to Q28

_____Fewer → go to Q29

_____The same → go to Q30

Q28. About how many more oceanfront beach trips would you take to the North Carolina coast from the Beaufort/Morehead City area to the South Carolina border with improved parking facilities and beach access?
_____ Trips (Number of trips, not percentage)

Once completed, go to Q30

Q29. About how many fewer oceanfront beach trips would you take to the North Carolina coast from the Beaufort/Morehead City area to the South Carolina border with improved parking facilities and beach access?
_____Trips (Number of trips, not percentage)

(Three versions of Q30)

Q30X1. Suppose that improved parking facilities and access areas were provided only in Carteret County. How many oceanfront beach trips would you plan to take to Carteret County during 2004?
_____ Trips (Number of trips, not percentage)

If 0, go to Q 32

Q31X1. How many of your oceanfront beach trips to Carteret County would be to:
    a.   Fort Macon State Park?   _____ Trips (Number of trips, not percentage)
    b.   Atlantic Beach?   _____ Trips (Number of trips, not percentage)
    c.   Pine Knoll Shores?   _____ Trips (Number of trips, not percentage)
    d.   Salter Path or Indian Beach?   _____ Trips (Number of trips, not percentage)
    e.   Emerald Isle?   _____ Trips (Number of trips, not percentage)

Q30X2. Suppose that improved parking facilities and access areas were provided only in Onslow County and Pender County. How many oceanfront beach trips would you plan to take to Onslow County and Pender County during 2004?
_____ Trips (Number of trips, not percentage)

If 0, go to Q 32

Q31X2. How many of your oceanfront beach trips to Onslow County and Pender County would be to:
    a.   North Topsail Beach?   _____ Trips (Number of trips, not percentage)
    b.   Surf City?   _____ Trips (Number of trips, not percentage)
    c.   Town of Topsail Beach?   _____ Trips (Number of trips, not percentage)

Q30X3. Suppose that improved parking facilities and access areas were provided only in Brunswick County. How many oceanfront beach trips would you plan to take to Brunswick County during 2004?
_____ Trips (Number of trips, not percentage)

If 0, go to Q 32

Q31X3. How many of your oceanfront beach trips to Brunswick County would be to:
    a.   Caswell Beach?   _____ Trips (Number of trips, not percentage)
    b.   Oak Island (Formerly Long Beach and Yaupon Beach)? _____ Trips (Number of trips, not percentage)
    c.   Holden Beach?   _____ Trips (Number of trips, not percentage)
    d.   Ocean Isle Beach?   _____ Trips (Number of trips, not percentage)
    e.   Sunset Beach?   _____ Trips (Number of trips, not percentage)

Q32. The current width of the dry sand beach area from the dune to the ocean at high tide at southeastern North Carolina oceanfront beaches is between 10 and 100 feet with an average of 75 feet. Would you say this current width is excellent, good, fair or poor?
    a.   ___Excellent
    b.   ___Good
    c.   ___Fair
    d.   ___Poor

Q33. Do you think adding 100 feet of width to the oceanfront beach would:
    a.   ___Improve the oceanfront beach and be about the right amount
    b.   ___Improve the oceanfront beach, but not be enough width
            b1.   How much additional sand would you like to see?   _____(Feet)
    c.   ___Improve the oceanfront beach, but would be too much extra width
            c1.   How much sand would you like to see?   _____(Feet)

d.   ___Not improve the oceanfront beach; the oceanfront beach width is fine as is
e.   ___Not improve the oceanfront beach; people should not alter the width of a beach
f.   ___Other (Please specify)_____

Q34. Beach nourishment is where sand is pumped to artificially widen the beach. Do you strongly support, support, neither support or oppose, oppose, or strongly oppose beach nourishment for southeastern North Carolina oceanfront beaches?
a.   ___Strongly support
b.   ___Support
c.   ___Neither support or oppose
d.   ___Oppose
e.   ___Strongly Oppose

Q35. Suppose a beach nourishment policy is implemented for all southeastern North Carolina oceanfront beaches. Beach nourishment would be performed in each county periodically, at least once every 3 to 5 years, for the 50-year life of the project. Periodic nourishment is done to maintain an increased beach width to provide shore protection and recreation benefit. The goal would be to make the average oceanfront beach width increase by 100 feet. Do you think this policy would be very effective, somewhat effective or not effective in increasing beach width?
a.   ___Very effective
b.   ___Somewhat effective
c.   ___Not effective

Q36. Think about the number of oceanfront beach trips that you plan to take to the North Carolina coast from the Beaufort/Morehead City area to the South Carolina border during 2004. Would you take more trips, fewer trips, or the same number of trips if the average beach were 100 feet wider?
_____More → go to Q37
_____Fewer → go to Q38
_____The same → go to Q39

Q37. About how many more oceanfront beach trips would you take to the North Carolina coast from the Beaufort/Morehead City area to the South Carolina border if the average beach were 100 feet wider?
_____ Trips (Number of trips, not percentage)

Once completed, go to Q39

Q38. About how many fewer oceanfront beach trips would you take to the North Carolina coast from the Beaufort/Morehead City area to the South Carolina border if the average beach were 100 feet wider?
_____Trips (Number of trips, not percentage)

Q39. Each oceanfront beach town in Carteret, Onslow, Pender, and Brunswick Counties would need to raise money to pay for a portion of the cost of the beach nourishment project. Suppose each town required an annual beach-parking permit for every car that parked in public, beach cottage, and hotel parking lots at each town's beaches. Do you strongly support, support, neither support or oppose, oppose, or strongly oppose a beach-parking permit policy?
a.   ___Strongly support
b.   ___Support
c.   ___Neither support or oppose
d.   ___Oppose
e.   ___Strongly oppose

(Three versions of Q40)

Q40X1. Suppose that each oceanfront beach town in Carteret, Onslow, Pender, and Brunswick Counties started requiring the beach-parking permits in 2004. One permit would allow you to park at beaches in each town for one year. Beach nourishment would be performed in each oceanfront beach town periodically for the 50-year life of the project. Would you buy an annual beach-parking permit in 2004 if it cost $10?
a.   ___Yes → go to Q41
b.   ___No → go to Q42

Q40X2. Suppose that each oceanfront beach town in Carteret, Onslow, Pender, and Brunswick Counties started requiring the beach-parking permits in 2004. One permit would allow you to park at beaches in each town for one

year. Beach nourishment would be performed in each oceanfront beach town periodically for the 50-year life of the project. Would you buy an annual beach-parking permit in 2004 if it cost $25?

a. ___Yes → go to Q41
b. ___No → go to Q42

Q40X3. Suppose that each oceanfront beach town in Carteret, Onslow, Pender, and Brunswick Counties started requiring the beach-parking permits in 2004. One permit would allow you to park at beaches in each town for one year. Beach nourishment would be performed in each oceanfront beach town periodically for the 50-year life of the project. Would you buy an annual beach-parking permit in 2004 if it cost $40?

a. ___Yes → go to Q41
b. ___No → go to Q42

Q41. Beach nourishment costs may be greater than expected. Would you buy an annual beach-parking permit in 2004 if it cost $50?

a. ___Yes → go to Q44
b. ___No → go to Q44

Q42. Beach nourishment costs may be lower than expected. Would you buy an annual beach-parking permit if it cost $5?

a. ___Yes → go to Q44
b. ___No → go to Q43

Q43. Why would you not buy the $5 annual beach-parking permit?

a. ___All my beach trips are to New Hanover County
b. ___I would stop taking beach trips to these areas
c. ___I can't afford it
d. ___The parking permit cost is too high
e. ___The parking permit is not fair
f. ___Beach users should not have to pay

Q44. How many individuals are typically in the vehicle when you make an oceanfront beach trip to the North Carolina coast?

_____ Individuals

Q45. What is the zip code at your permanent home address?

_____ Zip code

Q46. How many people, including yourself, normally live in your household?
_____ People → if 1, skip next question and go to Q 48

Q47. How many of these people are less than 18 years of age?
_____ People

Q48. Are you married?
_____Yes _____No

Q49. Are you male or female? (Don't ask if the answer is obvious; just mark the appropriate category.)
_____Male _____Female

Q50. Are you White (Non-Hispanic), Black (Non-Hispanic), Hispanic, Asian/Pacific Island, American Indian/Alaskan Native or some other race?
_____ White (Non-Hispanic) _____Black (Non-Hispanic) _____Hispanic
_____Asian/Pacific Island _____American Indian/Alaskan Native
_____Other (Please specify)_____

Q51. In what year were you born? 19_____

Q52. What is your highest level of education completed?
_____Less than high school graduate
_____High school graduate/GED
_____Some college/not a college graduate
_____Associate degree/community college graduate
_____Bachelors degree/college graduate
_____Masters degree

_____Graduate degree beyond Masters degree

Q53. As close as you can recall, what is your household's total annual income before taxes? Is it?
_____Less than $20,000
_____Between $20,000 and $39,999
_____Between $40,000 and $59,999
_____Between $60,000 and $79,999
_____Between $80,000 and $99,999
_____$100,000 or more
_____Refused
_____Don't know

This concludes our interview. Thank you very much for participating!

Appendix J: Recommended On-Site Survey Instrument

Hello, I'm_____ from _____ and we are conducting a Beach Access study for this beach. Your participation in this survey is entirely voluntary and will likely take less than five minutes. All answers will be kept confidential. Would you be willing to answer a few questions?

Date of Interview: _____ Starting Time: _____

Interview Location (Section):_____

1. Are you 18 years of age or older?
   a. Yes
   b. No (<u>TERMINATE INTERVIEW</u>)

2. How many individuals are in your party today? _____ individuals

3. Are you:
   a. A full-time or part-time resident of this beach town/community who owns property in this beach town/community
   b. A day user who did not spend the night in or around this beach town/community. How many miles did you travel one-way to reach this beach today?_____ miles
   c. An overnight visitor who spent at least last night or will spend this evening in or around this beach town/community
      ►How many days will you spend at <u>this</u> beach town/community on <u>this</u> trip? _____ days

4. What kind of transportation did you use to get to the beach <u>today</u>?
   a. Car/van
      ►How many people were in your vehicle today? _____
      ►Where did you park?
         a. Side street
         b. Public parking lot
         c. Other (SPECIFY _____)
      ►How long did it take you to find a parking spot? _____ minutes
      ►Did you have to pay for the parking? _____ Yes _____ No
         If Yes, how much _____ dollars
   b. Bicycle
   c. Walk
   d. Other (SPECIFY _____)

5. How would you rate the availability of public parking near this beach? Would you say it is:
   a. Excellent
   b. Good
   c. Fair
   d. Poor

6. If you parked in a public parking area, how many minutes did it take to walk from your parking spot to the beach? _____ minutes

7. What time did you and your party arrive on the beach for the first time today?
   _____ am/pm

8. What time will you and your party leave the beach for the last time today?
   _____ am/pm

9. During the current year, do you plan to visit this beach _____ the previous year?
   a. More often than
   b. The same as
   c. Less often than
   d. Didn't come to this beach last year

10. How important are each of the following in affecting the quality of your beach experience, with 1 being Very Important and 4 being Unimportant?

1= Very important   2= Important   3=Not very important   4=Unimportant

Availability of public parking	1	2	3	4
Parking within ¼ mile of the beach	1	2	3	4
Free parking	1	2	3	4
Restroom facilities	1	2	3	4
Shower facilities	1	2	3	4
Concessions facilities	1	2	3	4
Handicapped accessibility	1	2	3	4

11. If there was more public parking, would you make more trips to the beach?
    a. Yes   If yes, how many more trips?_____ trips
    b. No

12. Why did you choose this beach rather than another beach for this trip?

13. Some beach trips cost more than others. For example, on an overnight beach trip you may spend money for food, travel expenses, and lodging. On a day trip you may only spend money for gas. What do you expect will be your total expenses as an individual for this beach trip?
    a. $ _____.00   c. Don't know
    b. Refused   d. N/A (Live in beach town/community)

14. Beach trip costs change over time. For example, gas prices fell during the 1990s and rose during 2004. Would you have come to this beach for your beach trip if your total trip costs were [$A*: $5, $10, $25, $50, or $75] more than the amount you just reported?
    a. Yes   d. Don't know
    b. No   e. N/A (Live in beach town/community)
    c. Refused

* Each survey receives a sequentially assigned value for $A. Choose from $5, $10, $25, 50, or $75 and circle the cost.

15. What is the highest amount you would pay for a trip to this beach before cost influenced you to choose another beach destination?
    a. $ _____.00   c. Don't know
    b. Refused   d. N/A (Live in beach town/community)

16. If cost were a factor, which of the following statements best describes what you would do instead of taking the current trip to this beach?
    a. I would not leave home
    b. I would take a trip to a beach closer to my home
    c. I would take a different type of trip
    d. Some other reason (SPECIFY_____)

17. What was your total gross household income for 2004? Please indicate when we reach your range.
    a. Less than $20,000   e. $80,000 to $99,999
    b. $20,000 to $39,999   f. $100,000 or more
    c. $40,000 to $59,999   g. ___Refused
    d. $60,000 to $79,999   h. ___Don't know

18. What is the zip code at your permanent home? __ __ __ __ __

19. Do you have any other thoughts you would like to share regarding access and parking on this beach?

Thank you very much for your time.

Record: 1 - Male 2 - Female   Completion Time: _____

Guidelines for Weather Related
Conditions and Cancellations

1)   It is the responsibility of the study area coordinator to check and accurately record the weather conditions the evening before commencement of data collection at the study area, 2 hours immediately prior to the daily commencement of data collection at the study area, and, at 10:00 am the day of the data collection .   The coordinator is also responsible for recording the weather conditions at her/his individual study area periodically as each survey day progresses—preferably on an hourly basis.

2)   If the weather forecast calls for prolonged inclement weather lasting more than three (3) hours between the hours of 10:00 am and 4:00 pm, the coordinator will cancel the study day and reschedule.

3)   If there is a large front and continuous band of storms moving through an area of study between the hours of 10:00 am and 4:00 pm, the coordinator must determine whether or not the survey day will be a success for her/his individual study area, despite the inclement weather. Periodic showers and thunderstorms will not terminate a data collection event. The coordinator will "wait out" such periodic storm events and resume data collection after the storm event has passed. Parking counts must continue to be made even during periodic storm events. However, if the storm persists for more than two (2) hours, the coordinator will cancel the study day. The study day will be rescheduled if the coordinator must cancel the data collection event prior to the parking counts "peaking" (i.e. the point where the number of available parking spaces begins to decrease rather than increase).

4)   If a storm passes through the study area, the coordinator must wait it out to see if there is any continued bad weather "behind" it. The coordinator should expect and be prepared for periodic rain showers and thunderstorms during the data collection days. If rain and/or storms do come into a coordinator's individual study area, the coordinator can pick up his/her data collectors and assemble either in cars, or at a local restaurant, business, shelter, etc. to wait out the inclement weather. Every attempt will be made to safely complete each survey day.

5)   To determine a successful survey day once data collection has begun, the data must show that the parking space count has peaked and begun to level off at a similar level to that of the morning counts. (Think of a bell curve – in the morning there will be numerous open spaces and as the day progresses, there will be fewer spaces available. When the spaces begin to open up again, the day has reached its "peak."). It is the coordinator's responsibility to review parking count results as they are completed.

Appendix L: Recommended Parking Space Count Instrument

Date: _____

Beach: _____ **Parking Lot:** _____

GPS Coordinates: _____

Total Number of Spaces: _____ **Number of Handicapped Spaces:** _____

Time	Total Number of Open Parking Spaces	Total Number "Creative" Parking
9:		
10:		
11:		
12:		
1:		
2:		
3:		
4:		

Appendix M: Recommended Focus Group Survey Instrument

Focus Group Survey
Thank you for attending today's focus group regarding public beach access and parking at (insert name of community here). We would appreciate your response to the following questions to begin this process. Your responses are confidential and will not be used in conjunction with your name. When responding, please answer according to your peak beach season. For purposes of this survey, peak season can be defined as Memorial Day through Labor Day.

Date: _____   Are you a: Municipal/County Official? ☐   Community Leader? ☐   Business Leader? ☐

1. Are you:
    a. A resident of the beach town/community that you are here representing today
    b. A resident of another town/community
        _____(Please Specify)

2. Using your best estimate, what percentage of your community's oceanfront beach users are: (percentages should equal 100%)
    a. Residents (a full-time or part-time resident of this beach town/community who owns property in this beach town/community) of this beach town/community?
        _____%
    b. Day users (someone who does not spend the night in or around this beach town/community) of this beach town/community? _____%
    c. Overnight visitors (someone who spends at least one night in or around this beach town/community, but does not own property in this beach town/community) of this beach town/community? _____%

3. How far do you believe oceanfront beach day users travel on average to reach your beach town/community (**one way** from their primary residence)?
    _____ miles

4. What do you believe is the average length of stay for the average oceanfront beach user at your beach town/community's beaches during an average day?
    _____ hours

5. During the last beach season, did your beach town/community experience _____ ?
    a. More beach visits than in previous years
    b. Approximately the same number of beach visits as in previous years
    c. Fewer beach visits than in previous years

6. In your opinion, how important are each of the following in affecting the quality of the average oceanfront beach user's experience at your town/community's beaches? (Please circle one number for each question)

    1= Very important   2= Important   3=Not very important   4=Unimportant

a. Availability of public parking	1	2	3	4
b. Parking within ¼ mile of the beach	1	2	3	4
c. Free parking	1	2	3	4
d. Restroom facilities	1	2	3	4
e. Shower facilities	1	2	3	4
f. Concession facilities	1	2	3	4
g. Handicapped accessibility	1	2	3	4

7. How do you believe the average oceanfront beach user would you rate the availability of public parking near your town/community's beaches?
    a. Excellent
    b. Good
    c. Fair
    d. Poor

8. How long do you believe it takes the average oceanfront beach user to find a parking spot at your beach town/community's beaches?
    _____ minutes

9. What percentage of oceanfront beach users do you believe paid to park at your beach town/community's beaches?
    _____%

10. If there was more public parking, do you believe the average oceanfront beach day user would make more trips to your beach town/community's beaches?
    a. Yes (Please estimate the number of additional trips per year per user: _____ trips)
    b. No

11. How do you believe the average oceanfront beach user would rate the availability of beach access for the public at your beach town/community's oceanfront beaches?
    a. Excellent
    b. Good
    c. Fair
    d. Poor

12. How many minutes do you believe it takes the average oceanfront beach user to walk from their parking spot to get to your beach town/community's beaches?
    _____ minutes

13. Do you think people would make more beach trips to your beach town/community if public oceanfront beach access was improved?
    a. Yes (Please estimate the number of additional trips per year per user: _____ trips)
    b. No

14. Some beach trips cost more than others. For example, an overnight oceanfront beach trip may include money for food, travel expenses and lodging. On a day trip a visitor may only spend money for gas. What do you believe is the average total expense for the typical beach user who visits your beach town/community's beaches?
    a. $_____.00 (Day User)
    b. $_____.00 (Overnight Visitor)

15. What is the highest amount you believe the typical oceanfront beach user would pay for a beach trip to your beach town/community before cost influenced the user to choose another beach destination?
    a. $_____.00 (Day User)
    b. $_____.00 (Overnight Visitor)

16. Some people take fewer oceanfront beach trips than they would like to take. Which of the following reasons limits the number of oceanfront beach trips that people take to your beach town/community's beaches? (PLEASE CIRCLE ALL THAT APPLY)
    a. Lack of time?
    b. Lack of money?
    c. Lack of sufficient shower facilities?
    d. Lack of sufficient restroom facilities?
    e. Lack of sufficient concession facilities?

    f.   Lack of sufficient disability parking?
    g. Lack of dry sand beach area?
    h. Lack of sufficient parking facilities?
    i.   Lack of sufficient access facilities?
    j.   Congestion at the beach itself?
    k. Congestion on the roads leading to the beach?
    l.   Other (Please specify_____)

17. On average, how wide would you estimate your beach town/community's oceanfront beaches are, based on the width of the dry sand beach at high tide?
       _____ feet

18. How do you believe the typical beach user would rate the current width of your beach town/community's oceanfront beaches?
    a. Excellent
    b. Good
    c. Fair
    d. Poor

19. If you did not choose "excellent" in question 18, what would the average width of your beach town/community's beach need to be in order for your oceanfront beach users to rate it as excellent?
       _____ feet

20. What would you estimate the average width of your beach town/community's oceanfront beach would need to be in order to accommodate the maximum number of visitors you could receive?
       _____ feet

21. Some local communities collect revenue by charging users to park when they visit the oceanfront beach. What is your opinion on charging the public a fee to park?
    a. Strongly support
    b. Support
    c. Oppose (Please explain_____)
    d. Strongly oppose (Please explain_____)

22. If charging the public an annual fee to park were mandatory, how much do you believe oceanfront beach day users would be willing to pay for an annual permit to park in public parking?
       $_____.00

23. What do you believe was the gross household income in 200x for the average resident at your beach town/community's beaches?

a. Less than $20,000	d. $60,000 to $79,999
b. $20,000 to $39,999	e. $80,000 to $99,999
c. $40,000 to $59,999	f. $100,000 or more

24. What do you believe was the gross household income in 200x for the average day user at your beach town/community's beaches?

a. Less than $20,000	d. $60,000 to $79,999
b. $20,000 to $39,999	e. $80,000 to $99,999
c. $40,000 to $59,999	f. $100,000 or more

25. What do you believe was the gross household income in 200x for the average overnight visitor at your beach town/community's beaches?

    a. Less than $20,000   d. $60,000 to $79,999
    b. $20,000 to $39,999   e. $80,000 to $99,999
    c. $40,000 to $59,999   f. $100,000 or more

This concludes the survey. Thank you very much for your time.

Focus Group Discussion Guide

Parking and Oceanfront Beach Access

Municipal/County Officials, Community Leaders and Business Leaders

I.   Introduction

    A.   Welcome

- My name is _____. I am the _____ and have been contracted by _____ to facilitate a focus group discussion regarding beach parking and oceanfront beach access at your beaches in relation to beach nourishment.
- I will also administer a short survey
- Thank you for joining me today

    B.   Purpose

- Your input in today's survey and discussion is very important
- _____ would like to find out how you, the municipal/county officials, community leaders and business leaders of _____ (*specify exact beach community*) perceive beach parking and oceanfront beach access.
- As leaders, what you tell us today will help us understand beach parking and oceanfront beach access needs in your town/community from your perspective.
- You are one of _____ beach town/communities participating in this project.
- You'll be here for about an hour to an hour and a half.

    C   Self-Introduction

- Ask each participant to introduce him/herself and tell the other participants about his/her occupation and experience in _____ (*specify exact beach community*)

    D.   Procedure
- I will incorporate your thoughts and suggestions into a final report that will be submitted to the U.S. Army Corps of Engineers.
- We are interested in all of your ideas, comments and suggestions and there are no right or wrong answers. All comments, both positive and negative are welcome.
- Feel free to disagree with one another, as this is a discussion.
- I would prefer that only one person speak at a time since I am interested in what everyone has to say.
- We will try to keep this discussion under an hour so we will move through the questions in a timely fashion. I may have to end a discussion and move on to another topic so please don't be offended.
- Please remember that I am a neutral party.

    E.   Need to explain about the note taker and tape recorder.

II.   Focus Group Discussion: Survey Instrument

    A.   Need to introduce, explain and administer the focus group survey. Individuals have 15 minutes to complete. Note that when asked on the survey, they need to answer from the "users" perspective.

III. Focus Group Discussion: Introduction

    A. What do you think are the best features of your beach? Why would the public choose to visit yours over the competition?

    B. Is your town/community interested in attracting more visitors during the peak season and what role does parking and beach access play in limiting or attracting visitors?

    C. What are the barriers, if any, to attracting more visitors?

IV. Focus Group Discussion: Verification of Categories

    A. When you think about the people who use your beach, do you have a particular way of categorizing them? *For example, as you read in the survey, we categorized users into three groups: Day Users, Overnight Users and Resident Users.* Do you think this an accurate way to categorize people who visit your beach, or do you have other definitions that you prefer to use? (prompt to see if business owners/town managers have different definitions)

V. Focus Group Discussion: Oceanfront Beach Access

    A. How adequate is oceanfront beach access in your town/community?
- Can day users find them easily?

    B. If not, what are the challenges and obstacles to having limited access? If there are challenges, what have you done or what do you plan to do to alleviate the problem? If you cannot fix the problem, please tell me why.

    C. If your oceanfront beach access is adequate, please tell me why.

VI. Focus Group Discussion: Parking

    A. Tell me about public parking in your beach community. How adequate is public parking during the "peak" season?
- Is parking easy to find? Why or why not?
- Do you have adequate parking close to a beach access? If it is adequate why? If it is not, why?

    B. If you do not feel you have an adequate number of parking spaces during the "peak season," what are the challenges and obstacles to fixing this problem? If parking has been a problem during peak season, explain what has your community has done or not done to fix the problem? Why?

VII. Focus Group Discussion: Parking/Access Fee

    A. Some local beach communities collect revenue by charging users to park when they visit the beach. What is your opinion on charging the public a fee to park?

    B. What groups of people would you consider it appropriate to charge a fee? Overnight users? Day users? Residents?

VIII. Closing

    A. Are there any more thoughts on the discussion?

    B. Thank you and goodnight

Appendix O: Recommended Telephone Survey Instrument

Hello, I'm from _____ and my name is _____. I am calling to ask some questions on behalf of the U.S. Army Corps of Engineers about your use of oceanfront beaches in _____. This is part of an important research study to determine the adequacy of public access, public parking and citizen's perceptions of beach nourishment projects at the oceanfront beaches in _____. Your participation in this study is entirely voluntary and all of your responses will be confidential. You may refuse to participate or you may stop participating at any time without adverse effects. The survey will only take about 10 – 15 minutes.

The Office of Management and Budget Control (OMB) number for this study is _____.

Are you at least 18 years old?
_____ Yes—Ask: Are you willing to answer a few general questions about the number of trips you take to the oceanfront beaches in North Carolina?
_____ Yes—Proceed to Q1 _____ No—terminate the interview and thank the individual
_____ No—Ask if there is someone in the house at least 18 years of age that you can speak to. If yes, ask to speak to that individual and begin from above—"Hello..." If no, terminate the interview and thank the individual.

Q1. What is the zip code at your permanent home address?
_____ Zip code

Q2. How many people, including yourself, normally live in your household?
_____ People → if 1, skip next question and go to Q 4

Q3. How many of these people are less than 18 years of age?
_____ People

Q4. Are you married?
_____ Yes _____ No

Q5. Are you male or female? (Don't ask if the answer is obvious; just mark the appropriate category.)
_____ Male _____ Female

Q6. Are you White (Non-Hispanic), Black (Non-Hispanic), Hispanic, Asian/Pacific Island, American Indian/Alaskan Native or some other race?
_____ White (Non-Hispanic) _____ Black (Non-Hispanic) _____ Hispanic
_____ Asian/Pacific Island _____ American Indian/Alaskan Native
_____ Other (Please specify)_____

Q7. In what year were you born? 19_____

Q8. What is your highest level of education completed?
_____ Less than high school graduate
_____ High school graduate/GED
_____ Some college/not a college graduate
_____ Associate degree/community college graduate
_____ Bachelors degree/college graduate
_____ Masters degree
_____ Graduate degree beyond Masters degree

Q9. As close as you can recall, what is your household's total annual income before taxes? Is it?
_____ Less than $20,000
_____ Between $20,000 and $39,999
_____ Between $40,000 and $59,999
_____ Between $60,000 and $79,999
_____ Between $80,000 and $99,999
_____ $100,000 or more
_____ Refused
_____ Don't know

Q10. Have you considered going to an oceanfront beach in North Carolina* during the last year?

_____Yes → go to Q11

_____No →This concludes our interview. Thank you very much for participating!

Q11. Did you actually take any oceanfront beach trips to the North Carolina coast in 2003?

_____Yes → go to Q12

_____No → go to Q21

Q12. How many oceanfront beach trips to the North Carolina coast did you take in 2003?

_____ Trips (Number of trips, not percentage)

Q13. How many of these oceanfront beach trips were day trips, where you returned to your home on the same day that you left?

_____ Trips (Number of trips, not percentage)

Q14. How many of your oceanfront beach trips were to **Carteret County**?

_____ Trips (Number of trips, not percentage)

If 0, go to Q21

Q15. How many of these trips to **Carteret County** were day trips?

_____ Trips (Number of trips, not percentage) → go to Q16

Q16. How many of your oceanfront beach trips to **Carteret County** were to:

a.	**Fort Macon State Park**?	_____Trips (Number of trips, not percentage)
b.	**Atlantic Beach**?	_____Trips (Number of trips, not percentage)
c.	**Pine Knoll Shores**?	_____Trips (Number of trips, not percentage)
d.	**Salter Path or Indian Beach**?	_____Trips (Number of trips, not percentage)
e.	**Emerald Isle**?	_____Trips (Number of trips, not percentage)
f.	Other beach locations in **Carteret County**?	_____Trips (Number of trips, not percentage)
	(Please specify)_____	

Q17. Was **2003** a typical year in terms of your oceanfront beach trips to **Carteret County**?

_____Yes → go to Q19

_____No → go to Q18

Q18. Do you typically take more or fewer oceanfront beach trips to **Carteret County**?

_____More

_____Fewer

Q19. Do you plan to take at least one oceanfront beach trip to **Carteret County** during **2004**?

_____Yes

_____No → go to Q21

Q20. As best as you can predict, how many oceanfront beach trips to the **Carteret County** coast do you plan to take during **2004**?

_____Trips (Number of trips, not percentage)

Q21. How many individuals are typically in the vehicle when you make an oceanfront beach trip to the **North Carolina** coast?

_____ Individuals

Q22. Some people take fewer oceanfront beach trips than they would like to take. Which of the following reasons limits the number of beach trips that you take? Answer all that apply.

a.	Lack of time?	_____Yes	_____No
b.	Lack of money?	_____Yes	_____No
c.	Lack of sufficient shower facilities?	_____Yes	_____No
d.	Lack of sufficient restrooms?	_____Yes	_____No
e.	Lack of sufficient concessions?	_____Yes	_____No
f.	Lack of sufficient disability parking?	_____Yes	_____No
g.	Lack of dry sand beach area?	_____Yes	_____No
h.	Lack of sufficient parking facilities?	_____Yes	_____No
i.	Lack of sufficient access facilities?	_____Yes	_____No
j.	Congestion at the beach itself?	_____Yes	_____No

k. Congestion on the roads leading to the beach? _____Yes _____No
l. Other (please specify)_____ _____Yes _____No

Q23. In general, would you say that current parking facilities at **Carteret County** oceanfront beaches are excellent, good, fair, or poor?
a. ___Excellent
b. ___Good
c. ___Fair
d. ___Poor

Q24. In general, would you say that current beach access at **Carteret County** oceanfront beaches is excellent, good, fair, or poor?
a. ___Excellent
b. ___Good
c. ___Fair
d. ___Poor

Q25. Suppose that parking facilities and beach access at **Carteret County** oceanfront beaches were improved so that you would not have to spend time searching for a parking space or access area, the parking space and access area would be located within reasonable walking distance of the oceanfront beach, and parking was free or reasonably priced. Also suppose that the number of beach users at the oceanfront beaches does not change. Would you say that improved parking conditions at **Carteret County** oceanfront beaches would be excellent, good, fair, or poor?
a. ___Excellent
b. ___Good
c. ___Fair
d. ___Poor

Q26. Compared to the number of oceanfront beach trips that you plan to take to **Carteret County** during **2004**, would you take more trips, fewer trips, or the same number of trips with improved parking facilities and access areas?
_____More → go to Q27
_____Fewer → go to Q28
_____The same → go to Q29

Q27. About how many more oceanfront beach trips would you take to the **Carteret County** coast with improved parking facilities and beach access?
_____ Trips (Number of trips, not percentage)

Once completed, go to Q29

Q28. About how many fewer oceanfront beach trips would you take to the **Carteret County** coast with improved parking facilities and beach access?
_____Trips (Number of trips, not percentage)

(Three versions of Q29 and Q30—Only to be utilized if comparing more than one oceanfront beach study area)

Q29X1. Suppose that improved parking facilities and access areas were provided only in **Carteret County**. How many oceanfront beach trips would you plan to take to **Carteret County** during **2004**?
_____ Trips (Number of trips, not percentage)

If 0, go to Q 31

Q30X1. How many of your oceanfront beach trips to **Carteret County** would be to:
a. **Fort Macon State Park**? _____ Trips (Number of trips, not percentage)
b. **Atlantic Beach**? _____ Trips (Number of trips, not percentage)
c. **Pine Knoll Shores**? _____ Trips (Number of trips, not percentage)
d. **Salter Path or Indian Beach**? _____ Trips (Number of trips, not percentage)
e. **Emerald Isle**? _____ Trips (Number of trips, not percentage)

Q29X2. Suppose that improved parking facilities and access areas were provided only in **Onslow County** and **Pender County**. How many oceanfront beach trips would you plan to take to **Onslow County** and **Pender County** during **2004**?

____ Trips (Number of trips, not percentage)

If 0, go to Q 31

Q30X2. How many of your oceanfront beach trips to **Onslow County** and **Pender County** would be to:
 a. **North Topsail Beach**?   _____ Trips (Number of trips, not percentage)
 b. **Surf City**?   _____ Trips (Number of trips, not percentage)
 c. **Town of Topsail Beach**?   _____ Trips (Number of trips, not percentage)

Q29X3. Suppose that improved parking facilities and access areas were provided only in **Brunswick County**. How many oceanfront beach trips would you plan to take to **Brunswick County** during **2004**?
____ Trips (Number of trips, not percentage)

If 0, go to Q 31

Q30X3. How many of your oceanfront beach trips to **Brunswick County** would be to:
 a. **Caswell Beach**?   _____ Trips (Number of trips, not percentage)
 b. **Oak Island**?   _____ Trips (Number of trips, not percentage)
 c. **Holden Beach**?   _____ Trips (Number of trips, not percentage)
 d. **Sunset Beach**?   _____ Trips (Number of trips, not percentage)

Q31. The current width of the dry sand beach area from the dunes and vegetation to the ocean at high tide at **Carteret County** oceanfront beaches is between **10 and 100 feet with an average of 75 feet**. Would you say this current width is excellent, good, fair or poor?
 a. ___Excellent
 b. ___Good
 c. ___Fair
 d. ___Poor

Q32. Beach nourishment is where sand is pumped to artificially widen the beach. Do you strongly support, support, neither support or oppose, oppose, or strongly oppose beach nourishment for **southeastern North Carolina** oceanfront beaches?
 a. ___Strongly support
 b. ___Support
 c. ___Neither support or oppose
 d. ___Oppose
 e. ___Strongly Oppose

Q33. Do you think adding 100 feet of width to the oceanfront beach in **Carteret County,** making the dry sand beach area an average of **175 feet wide rather than 100 feet wide**, would:
 a. ___Improve the oceanfront beach and be about the right amount
 b. ___Improve the oceanfront beach, but not be enough width
   b1. How much additional sand would you like to see **beyond 175 feet**?
   ____(Feet)
 c. ___Improve the oceanfront beach, but would be too much extra width
   c1. If **not 175 feet wide**, how wide would you like to see the dry sand beach area?
   ____(Feet)
 d. ___Not improve the oceanfront beach; the oceanfront beach width is fine as is
 e. ___Not improve the oceanfront beach; people should not alter the width of a beach
 f. ___Other (Please specify)_____

Q34. Suppose a beach nourishment policy is implemented for all **southeastern North Carolina** oceanfront beaches. Beach nourishment would be performed in each county periodically, at least once every 3 to 5 years, for the 50-year life of the project. Periodic nourishment is done to maintain an increased beach width to provide shore protection and recreation benefit. The goal would be to make the average oceanfront beach width increase by 100 feet. Do you think this policy would be very effective, somewhat effective or not effective in increasing beach width?
 a. ___Very effective
 b. ___Somewhat effective
 c. ___Not effective

Q35. Think about the number of oceanfront beach trips that you plan to take to the **North Carolina** coast from the **Beaufort/Morehead City area to the South Carolina border** during **2004**. Would you take more trips, fewer trips, or the same number of trips if the average beach were 100 feet wider?

        More → go to Q36
        Fewer → go to Q37
        The same → go to Q38

Q36. About how many more oceanfront beach trips would you take to the **North Carolina** coast from the **Beaufort/Morehead City area to the South Carolina border** if the average beach were 100 feet wider?

     Trips (Number of trips, not percentage)

Once completed, go to Q38

Q37. About how many fewer oceanfront beach trips would you take to the **North Carolina** coast from the **Beaufort/Morehead City area to the South Carolina border** if the average beach were 100 feet wider?

        Trips (Number of trips, not percentage)

Q38. Each oceanfront beach town in **Carteret, Onslow, Pender, and Brunswick Counties** would need to raise money to pay for a portion of the cost of the beach nourishment project. Suppose each town required an annual beach-parking permit for every car that parked in public, beach cottage, and hotel parking lots at each town's beaches. Do you strongly support, support, neither support or oppose, oppose, or strongly oppose a beach-parking permit policy?

    a.   ___Strongly support
    b.   ___Support
    c.   ___Neither support or oppose
    d.   ___Oppose
    e.   ___Strongly oppose

(Three versions of Q39)

Q39X1. Suppose that each oceanfront beach town in **Carteret, Onslow, Pender, and Brunswick Counties** started requiring the beach-parking permits in **2004**. One permit would allow you to park at beaches in each town for one year. Beach nourishment would be performed in each oceanfront beach town periodically for the 50-year life of the project. Would you buy an annual beach-parking permit in **2004** if it cost $10?

    a.   ___Yes → go to Q40
    b.   ___No → go to Q41

Q39X2. Suppose that each oceanfront beach town in **Carteret, Onslow, Pender, and Brunswick Counties** started requiring the beach-parking permits in **2004**. One permit would allow you to park at beaches in each town for one year. Beach nourishment would be performed in each oceanfront beach town periodically for the 50-year life of the project. Would you buy an annual beach-parking permit in **2004** if it cost $25?

    a.   ___Yes → go to Q40
    b.   ___No → go to Q41

Q39X3. Suppose that each oceanfront beach town in **Carteret, Onslow, Pender, and Brunswick Counties** started requiring the beach-parking permits in **2004**. One permit would allow you to park at beaches in each town for one year. Beach nourishment would be performed in each oceanfront beach town periodically for the 50-year life of the project. Would you buy an annual beach-parking permit in **2004** if it cost $40?

    a.   ___Yes → go to Q40
    b.   ___No → go to Q41

Q40. Beach nourishment costs may be greater than expected. Would you buy an annual beach-parking permit in **2004** if it cost $50?

    a.   ___Yes → go to Q41
    b.   ___No → go to Q41

Q41. Beach nourishment costs may be lower than expected. Would you buy an annual beach-parking permit if it cost $5?

    a.   ___Yes →This concludes our interview. Thank you very much for participating!
    b.   ___No → go to Q42

Q42. Why would you not buy the $5 annual beach-parking permit?

    a.   ___All my beach trips are to **New Hanover County**

b.   ___I would stop taking beach trips to these areas
c.   ___I can't afford it
d.   ___The parking permit cost is too high
e.   ___The parking permit is not fair
f.   ___Beach users should not have to pay

This concludes our interview. Thank you very much for participating!

*NOTE: All entries in bold lettering will need to be changed to coincide with the specific study area in question and the appropriate year.