Appendix S2c
(Final Product)

SUMMARY REPORT FOR CRMP GRANT NA89AA-D-CZ134

GEOGRAPHICALLY REFERENCE CHESAPEAKE BAY PUBLIC ACCESS DATA: EXISTING BEACHES, STATE PARKS AND A SUMMARY OF NATURAL HERITAGE AREAS DATA FOR ECOMAPS USING JAMES CITY COUNTY

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I. STATEMENT OF PROJECT PURPOSE

This grant employs James City County as a pilot project. Several methods of data entry have been tested to determine the optimum technique or approach for database entry for similar Department of Conservation and Recreation (DCR) natural resource information. For each approach applied, the data has been compiled and exhibited using Arc/Info. A comparison of these methods including data accuracy, data output, and the time required for each method. The following data elements for James City County/City of Williamsburg are included in this pilot project: existing beaches, state parks, a summary of Natural Heritage areas data, cultural resources within one-half mile of tidal water bodies, public access sites and private access sites.

II. METHOD A

Overview of Tasks Required for Method A

This method uses the James City County/City of Williamsburg map and matrix from the *Chesapeake Bay Area Public Access Plan*. Each of the points and polygons associated with the data shown on this map has been digitized three times to establish the error due to data accuracy. The data accuracy, process, and time required to complete this method have been documented. The steps outlined in the Scope of Work (Appendix A) are described below.

Step 1. The Council on the Environment VA Ecomaps produced and original base map at 1:100,000 scale of the James City County/City of Williamsburg. This base map was reproduced to provide a base with the appropriate longitudinal and latitudinal reference points for digitization . This base map was reproduced on the large plotter to be identical to the one used for the *Chesapeake Bay Area Public Access Plan*.

Step 2. A mylar was made of this base map at 80% of the original. This step was necessary to obtain a base which contained the longitudinal and latitudinal reference points at the same size as the camera-ready copy for the Chesapeake Bay Area Public Access Plan.

Step 3. The camera-ready overlays were then re-registered to the new base containing the reference points.

Step 4. Using Arc/Info the geographic information from the camera-ready mylar, several coverages were created and digitized. These coverages include:

EROSION

This coverage includes all shoreline erosions and was digitized as polygons.

HERPOLY

This coverage includes all the Natural Heritage areas identified in the Plan. These areas was digitized as polygons.

CULTURAL

This coverage includes label points which indicated the location of the sized-points with a symbol.

BEACH

This coverage includes beaches and was digitized as a line.

ACCESS

This coverage includes all the public and private access points. Each access site is identified with a #-symbol attached to the point location at the time of digitization

LINE

This coverage includes all the lines which are used as leader lines and connectors for labeling symbols on the various coverages.

Step 5. The Procedure Used for Digitizing Includes the Following Steps

A. The first coverage was created and the four reference points were digitized. The Root Mean Square (RMS) Error reading was .002.

B. Using the TIC and BND files from the first coverage that was digitized, all other coverages were digitized and saved.

C. To avoid having to CLEAN the coverages, the INTERSECTARC and ARCSNAP environment were used during the digitizing sessions. The coverages were then edited. Dangle nodes were deleted, arcs modified, and label points were checked for uniqueness. Coverages which had errors were modified and changes were saved.

D. Each coverage was then BUILD using the appropriate option. Topology was constructed by BUILD identifying arcs that made up each polygon, and associating a label point with each polygon.

E. Since the original base was in UTM meters, the coordinates of the coverages that were digitized had to be transformed from the digitizer's inches to UTM meters prior to a determination for the level of accuracy. A PROJECTION was executed to ensure there was a relationship between locations on the coverage and their true location. The PROJECT command calculates the UTM coordinates for each of the digitized tics. After the PROJECTION, the ARC CREATE command was used to create an empty coverage with the UTM coordinates as its tics. INFO was initiated to update the empty coverage. The tic file was selected and the UTM values were entered for the four reference tics obtained.from the output of th PROJECT command. INFO was then exited after the completion of the ADD command. New coverages with UTM tics were then created from each digitized coverage. Finally, a transformation was performed to calculate and display the Root Mean Square (RMS) Error. The RMS error were calculated at 0.10 inches (input) and 30.848 UTM meters (output). The nationally accepted eror for a 1:100,000 scale map is 50 meters.

F. The text and pointers were added to the coverages to indicate the type of point locations. A separate coverage was created and named POINTLAB. This coverage contains label points which correspond to lines (arcs) in the POINTERS>UTM18 coverage. These points were used to indicate the location of the text. The FORM command was used to input the label attributes at the different locations. The coverage was saved. POINTLAB was then BUILD in ARC with the POINT option.

Step 6. The attributes were entered for the public, private and potential access sites as shown on the James City County/City of Williamsburg matrix found in the *Chesapeake Bay Area Public Access Plan* . The following procedure was followed for this step:

1. Initiate INFO.

2. A database was created (SITE.DESCR)

3. The items to be included in the database were named and described. Characteristics included in the description are item width, output width and item type.

4. Records were then added to the database using ADD command. Once the records were added, INFO was exited.

5. Key values 1, 2, or 3 representing PUBLIC, PRIVATE or POTENTIAL respectively were assigned to the access related items in the database. ARC was inititated for the assignment of these values. The ADDITEM command was then used with the appropriate options in assigning key values to the access sites.

Below is a list of items in the database, and the Key Value for each.

MATRIX NAME	INFO NAME	KEY VALUE
Site Identifiaction	SITE_ID	1 through 10
	TYPE	PUBLIC
		PRIVATE
		POTENTIAL
	TYPE_CODE	1
		2
		3
Location	NAME LOCATION	

All of the items listed with the exception of REMARKS have '0' or '1' as their key value. The '0' means the shoreline planning factor does not exist and the '1' indicates the factor is present.

Shoreline Erosion	SHORE_ERROS	0 or 1
Wetlands	WETLANDS	
Natural Heritage Areas	NAT_HERITAGE	
Cultural Resources	CUL_RESOURCES	
Boat Launch Ramp	BOAT_RAMP	
Bank & Pier Fishing	BANK/PIER_FISH	
Existing Beach	BEACH	
Swimming	SWIMMING	
Nature Study/Education	NATURE_STUDY	
Hiking	HIKING	
Picnicking	PICNICKING	
Camping	CAMPING	
Hunting	HUNTING	
Number of Marina Slips	MARINA_SLIPS_#	
Pumpout	PUMPOUT	
User's Fee	USER'S FEE	
Remarks	REMARKS	

Accuracy

The most important aspect of map accuracy relates to the original data. The original base map was plotted at 1:100,000 and was reduced to by 80% of the original for the *Chesapeake Bay Area Public Access Plan*. The original overlays were created to fit the reduced version of the map. This obviously resulted in some distortion and inaccuracy in the development of information at this scale. In calculating the RMS ERROR for a map at a scale of 1:100,000, the results should be 50 meters in UTM meters.

The coverages for Method A were digitized three times. Four tics were entered the first time the data was digitized. Five tics were used for digitization of the coverages the second and third time. Listed below are the results of these digitizing sessions:

	RMS ERROR (input) Digitizer's Inches	RMS ERROR (output) UTM Meters
1st Time	0.010	30.848
2nd Time	0.007	22.268
3rd Time	0.008	25.920

Time Requirements

The time period was documented for the steps taken to complete Method A may vary with relation to the amount of data present in other counties.

Prior to digitizing the coverages, the following decisions were made:

1) Naming the coverages
2) Deciding what will be digitized in each coverage
3) Assigning IDs to items in each coverage
4) Deciding how each coverage will be digitized and build as (arcs, label, line, etc.)

TIME: 2 Hours

Digitizing

Setup	1 Hour
Digitize Coverages	1 Hour - Point Coverages
	1 Hour - Polygon Coverages
	0.5 Hour - Line Coverages

TIME: 3.5 Hours

Editing & Building
Editing and Building coverages depends on how well the coverage was digitized.
TIME: 2 Hours

Projection & Transformation
This includes determining the longitude and latitude of the digitized tics, creating the files, and performing the projection and transformation.
TIME: 2 Hours

To create an additional coverage, the text location was specified, the coverage built, and the form command used to input the label attributes.
TIME: 3 Hours

Attributes
Enter the attributes in the database file.
TIME: 3 Hours

Plotfile & Overlay
Create a plotfile and perform an overlay of the coverages to check the digitized coverages.
TIME: 8 Hours

Map Composition & Plotfile
Compose the map in a graphically appealling format.
TIME: 24 Hours

Documentation
Written documentaion of the process.
TIME: 8 Hours

TOTAL TIME: 53.5 Hours

Evaluation of Method A
Method A is an example of the direct application of using a work product which was originally produced in a manual format and entering this data into a geographic information system. The problems encountered with this technique relate to the base maps which were trimmed to fit on a standard 17" x 22" sheet size. This process caused some of the tic IDs to be eliminated from the original base map. When the original tic IDs are not located on the base map a process to

relocate these IDs must be followed as in the case of James City County. A second problem occurred in relocating the tic IDs on the original base map if the map was reduced to fit the standard 17" x 22" sheet. There is a degree of error inherent in the process of transferring the tic IDs and working with a reduced base map.

III. METHOD B

Method B was eliminated from the work plan as the level of efficiency is much greater with the use of a digitizer.

IV. METHOD C

Overview of Tasks for Method C

Method C involves the use of the original sources of data as the source for digitizing and assigning attributes to the geographic information presented in the *Chesapeake Bay Area Public Access Plan*.

Step 1: Digitize the geographic points from the original data sources.

a) Natural Heritage Areas - Natural Heritage Area data was not available on 7.5 minute USGS quad sheets, The compilation of data for the Chesapeake Bay Area Public Access Plan was determined to be the most appropriate and the original data source for this information. The original sheets are on 1:100,000 USGS photocopied maps prepared for the *Chesapeake Bay Area Public Access Plan* and permanently retained in the Department of Conservation and Recreation, Division of Natural Heritage.

b) Cultural Resources - The cultural resources national register properties located within one-half mile of a water body were transferred from the Department of Historic Resources 7.5 minute USGS quad sheets to each of the county maps for use in the *Chesapeake Bay Area Public Access Plan*. For the purposes of this method, the information located on the original Department of Historic Resources 7.5 minute quad sheets were transferred to photocopies of 7.5 minute quad sheets covering James City County and the City of Williamsburg. In addition to the National Register sites, state register and National Historic Landmarks were included in the inventory. A total of 22 historic sites which are on the register were identified. Eighteen (18)

of these sites are within one-half mile of a water body. These sites were transferred to a mylar prior to digitizing.

The following are the transformation results after digitizing this data:

TRANSFORMATION RESULTS

QUAD SHEET	COVERAGE	RESULT
TOANO	C2	0.633E-02
	C2P	0.633E-02
GRESSITH	C3P	0.117E-01
BRANDON	C4	0.748E-02
NORGE	C5	0.405E-02
	C5P	0.405E-02
WILLIAMSBURG	C6	0.587E-02
	C6P	0.587E-02
SURRY	C8	0.649E-02
HOG ISLAND	C9	0.776E-02
	C9P	0.776E-02
YORKTOWN	C10	0.588E-02

c) Existing Beaches

The beach locations were marked on photocopies of the 1:100,000 scale USGS quad sheets by the Shoreline Programs Bureau of the Department of Conservation and Recreation. Longitudinal and latitudinal data also obtained from the Shorelines Programs Bureau for these beaches were entered during this step to test the accuracy of this data versus the information marked on the photocopied USGS maps. It was determined that the photocopied data was superior to the point locations available in logitude and latitude.

d) Shoreline Erosion

The Tidewater Inventory document published by the Virginia Institute of Marine Science (VIMS) was transferred to photocopies of the 1:100,000 scale USGS maps. This data was used to digitize the shoreline information. The rating used for shoreline erosion was classified in this method as follows:

Slight or none - less than 1 foot per year
Moderate - 1 to 3 feet per year
Severe - greater than 3 feet per year

Moderate and severe slopes were digitized.

The following are the transformation results after digitizing this data:

TRANSFORMATION RESULTS

QUAD SHEET	COVERAGE	RESULT
TOANO	E2	0.737E-02
BRANDON	E4	0.103E-02
NORGE	E5	0.543E-02
	E5S (Severe)	0.543E-02

e) State Parks

The Land Classification Maps developed by DCR for the location of York River State Park were evaluated for use in entering the park boundaries. Since these maps did not contain geographic reference points, the USGS 7.5 minute quad sheet boundary was used.

The following are the transformation results after digitizing this data:

TRANSFORMATION RESULTS

QUAD SHEET	COVERAGE	RESULT
GRESSITH	3	0.907E-02

f) Public Access Sites

The 1:100,000 scale USGS maps were used as the original source to record the sites found in the *Chesapeake Bay Area Public Access Plan*. The site locations were transferred to 7.5 minute USGS quad sheets for digitizing. Individuals within DCR who had field checked these public acess sites for the inventory verified their location.

g) Private Access Sites

The location of the sites were taken from the county maps found in the *Chesapeake Bay Area Public Access Plan*. The location of the private access sites were verified using aerial photography and transferred to 7.5 minute USGS quad sheets.

h) Potential Access Sites

The location of the sites were taken from the county maps found in the *Chesapeake Bay Area Public Access Plan*. The location of the potential access sites was verified by individuals familiar with the location via

a site visit. The locations were then transferred to 7.5 minute USGS quad sheets.

The following are the transformation results after digitizing this data:

TRANSFORMATION RESULTS

QUAD SHEET	COVERAGE	RESULT
BRANDON	A4	0.748E-02
NORGE	A5	0.405E-02
WILLIAMSBURG	A6	0.587E-02
SURRY	A8	0.649E-02
	A8P	0.649E-02
HOG ISLAND	A9	0.776E-02

The steps for digitizing the categories or coverages listed above were are outlined below.

DIGITIZING:

Using the USGS quad sheets , a naming convention was established and several coverages were created and digitized. It is recommended that the naming convention for USGS quad sheets which is consistent with that used by the Council on the Environment be followed.

1. For each coverage, eight (8) tics were digitized.

2. SNAPENVIRONMENTS were established for polygon coverages to avoid having to CLEAN.

3. POINT and POLYGON coverages were digitized for USGS quad sheets which contained information.

TRANSFORMATION:

The coordinates of the coverages when digitized were transformed from UTM meters to the digitizer's inches using the TRANSFORMATION comand. The level of accuracy was determined by transforming the data back to UTM meters.

1. A file was created using the EDITOR, and the longitude and latitude of the digitized tics entered into the file.

2. A projection was performed for latitude and longitude to UTM, to ensure that there is a known relationship between locations on the coverage and their actual location

3. An empty coverage was created with the UTM coordinates as its tics.

4. INFO was initiated and the tic values in the empty coverage were replaced by the UTM values using the UPDATE command.

5. New coverages were then created from each dititized coverage using UTM tics.

6. TRANSFORMATION was performed to calculate and display the Root Mean Square (RMS) Error. The calculation was achieved by the tic locations in the old coverage (digitizer's file) being compared to the input tics in the new coverage.

7. Polygon coverages were appended, edited and cleaned using the appropriate commands. Point coverages were built and appended.

STEP 2:
The attributes for the public private and potential access sites as shown on the James City County/City of Williamsburg matrix. Additional attributes were added for the Cultural Resources and Existing Beaches in this method. An input form which serves as a screen entry form was also created for use in updating records.

PROCEDURE
1. INFO was initiated.

2. Separate datafiles were created for access sites, cultural resources, existing beaches and shoreline erosion.

3. Items in the different datafiles were named and their characteristics were described.

4. After creating the datafile, the INPUT FORMS were created by using the SELECT command to select the DATAFILE.

5. After selecting the datafile, the INPUT FORM command was used with the name of the datafile to create the INPUT FORM.

6. Responses were made to the LINE<COLUMN<CONTENT> prompt to indicate the location of the line on the sceen, the content of the line, and the restrictions regarding what values can or must be added.

SOURCE:	DATAFILE:	INPUT FORM:
CULTURAL RESOURCE AREAS	CULTURAL_SITESI.	CULTURAL_SITE
EXISTING BEACHES	BEACH	I. BEACH
ACCESS SITES	ACCESS_SITES	I. ACCESS_SITES

Accuracy

The original sources for the information varies, consequently, the accuracy level of the data varies with each original source. The intent of this method was to use the original sources which were primarily 7.5 minute USGS quad sheets or 1:100,000 USGS quad sheets for direct entry of digitized data.

The coverages for Method C were digitized three times. Tic IDs were entered for each USGS quad sheet used in digitizing the information.

Time Requirements

The time required for the entry of data for Method C is documented below. The time required for completion of this method will vary with regard to the availability of the original base data sources for each county and the amount of data present in other counties.

Digitizing Coverages	20 Hours
Projection & Transformation	12 Hours
Cleaning & Building Coverages	8 Hours
Appending & Editing Coverages	8 Hours
Exporting Coverages to Prime	1 Hour
Plotfile & Overlay	4 Hours
Map Composition & Plotfile	24 Hours
Creating Datafiles & Data Entry	16 Hours
Documentation	16 Hours
TOTAL TIME:	109 Hours

Evaluation of Method C

Method C involves the digital entry of geographic information from the original source. The original source in this case usually relates to the information or maps used for the transfer of information to the county maps found in the *Chesapeake Bay Area Public Access Plan*. The problem with this method and the data used relates to the accuracy of the original data. Although much of the original data was field checked, some data such as private access sites were not verified. Other data was transferred or interpretted from other maps, historical site records, or written materials for the purpose of completing the *Chesapeake Bay Area Public Access Plan*. Significant time was also spent to retrace the availability of original source material and in some cases to transfer this original base material to a USGS 7.5 minute quad sheet. This time was not reported in the above Time Requirements section.

V. COMPARISON OF METHODS AND RECOMMENDATIONS

The time requirements for Method C almost double those required for Method A. In theory, Method C should be more accurate than Method A; however, in the case of this James City County/City of Williamsburg pilot project, the inaccuracies shown in the comparison of methods are predominantly due to human error in locating sites or transferring sites to the map used in the *Chespeake Bay Area Public Access Plan*. The level of accuracy found on the *Chesapeake Bay Area Public Access Plan* maps and on the digitized information from these maps is adequate for regional planning applications.

Because of the difference in time required for the two methods and the probable use of the digitized geographic information for large scale, regional planning, an overall application of Method A is recommended, However, prior to digitizing the information contained on the *Chesapeake Bay Area Public Access Plan* maps, the information should be field checked and/or verified using aerial photography. This verification step should eliminate most of the error and inaccuracies shown for Method A during the comparison of Methods A and B.

APPENDIX A

Work Plan for scope of work entitled: GEOGRAPHICALLY REFERENCE CHESAPEAKE BAY PUBLIC ACCESS DATA, EXISTING BEACHES, STATE PARKS, AND A SUMMARY OF NATURAL HERITAGE AREAS DATA FOR ECOMAPS USING JAMES CITY COUNTY AS A PILOT AREA.

August 9, 1990

The scope of work for this grant outlines five elements. A detailed description and work plan with projected target completion dates for each of these elements follows.

1. PURPOSE

Using James City County as a pilot project, several methods of data entry will be tested to determine the optimum (most desirable) technique or approach to database entry for similar Department of Conservation and Recreation (DCR) natural resource information. For each approach applied the data will be compiled and exhibited using Arc/Info. Comparisons will be mad between the various methods or approaches used. These comparisons will determine the accuracy of the product or data-output in relation to the time expended for data entry. The following data elements for James City County/City of Williamsburg will be included for each method used in this pilot project: existing beaches state parks, a summary of Natural Heritage areas data, cultural resources within one-half mile of tidal water bodies, public access sites, and private access sites. Attributes for the public and private access sites should be recorded from the James City County/City of Williamsburg matrix which corresponds to the map.

Target Dates for this portion of the scope of work follow:
Method A - October 31
Method B - December 31
Method C - February 28

A description and step-by-step process for each method to be used in this pilot project are outlined below.

METHOD A: OVERVIEW
Using the James City County/City of Williamsburg map which has been completed for the Chesapeake Bay Area Access Plan, digitize the geographic data points. Digitize each of these points three times to establish the error due to data accuracy.

STEP 1 Have the Council on the Environment, Virginia ECOMAPS make a base map at 1:100,000 scale of James City County/City of Williamsburg. Do not rim this base map and be certain this map has at least four longitudinal and latitudinal reference points.

STEP 2 Make a mylar of the untrimmed base at 80% of the original.

STEP 3 Transfer the registration ticks from the original mylar base which will be used as the camera-ready copy for the Chesapeake Bay Area Access Plan to the new base which has at least four longitudinal and latitudinal reference points.

STEP 4 Register the camera-ready mylar overlays showing cultural resources, Natural Heritage areas, state parks, public access sites, and potential access sites to the new base.

STEP 5 Using Arc/Info digitize the geographic information from the camera-ready mylar overlays which have been prepared for the Chesapeake Bay Area Access Plan.

STEP 6 Enter the attributes for the public, private and potential access sites as shown on the James City County/City of Williamsburg matrix.

STEP 7 Document the process, time, and ease of completion using this method.

METHOD B: OVERVIEW
Translate the Chesapeake Bay Access Plan data shown on the James City County/City of Williamsburg to an original mylar(s) made from the 1:100,000 scale USGS maps. Use the longitudinal and latitudinal location points taken from the 1:100,000 scale USGS maps to record the geographic data into Arc/Info.

STEP 1 Order from USGS or have A & E supply reproduce an original mylar(s) of the 1:100,000 scale USGS maps which show James City County/City of Williamsburg.

STEP 2 Translate the information mapped for the Chesapeake Bay Access Plan on to the 1:100,000 scale mylar(s).

STEP 3 Determine the latitudinal and longitudinal locations for each of the geographic points recorded on the maps.

STEP 4 Enter the latitudinal and longitudinal locations for the mapped points into Arc/Info.

STEP 5 Enter the attributes for the public, private, and potential access sites as shown on the James City County/City of Williamsburg matrix.

STEP 6 Document the process, time, and ease of completion using this method.

METHOD C: OVERVIEW
Use the original sources of data to digitize the geographic points shown on the Chesapeake Bay Area Access Plan map.

STEP 1 Digitize the geographic points shown on the Chesapeake Bay Area Access Plan map using the original data sources as follows:

a) Natural Heritage Areas - 7 1/2 minute USGS quad sheets located in the Division of Natural Heritage in DCR.

b) Cultural Resource Areas - 7 1/2 minute USGS quad sheets for standing and archeological sites which are on the National Register of Historic Places and are within 1/2 mile of a water body. These maps are located in the Department of Historic Resources.

c) Existing Beaches - 1:100,000 scale quad maps which indicate beaches according to the Shoreline Programs Bureau of DCR.

d) Shoreline Erosion - Use the Tidewater Inventory document published by the Virginia Institute of Marine Science (VIMS) or obtain longitudinal and latitudinal location points for shoreline erosion which exceeds 2 feet per year from the VIMS.

e) State Parks - Use the Land Classification maps being developed by DCR to digitize the location of the York River State Park.

f) Public Access Sites - 1:100,000 scale USGS maps which were used to record the sites recommended and the sites not recommended for inclusion in the Chesapeake Bay and Susquehanna River Public Access Guide.

g) Private Access Sites - Verify the locations of these access points as shown on the Chesapeake Bay Area Access Plan map of James City County/City of Williamsburg using aerial photography. Digitize the private access data from the Chesapeake Bay Area Access Plan map once the site locations have been verified using aerial photography.

h) Potential Access Sites - Digitize the potential access site data from the Chesapeake Bay Area Access Plan map of James City County/City of Williamsburg.

STEP 2 Enter the attributes for the public, private, and potential access sites as shown on the James City County/City of Williamsburg matrix.

2. PURPOSE

For each method used in the pilot project, prepare a summary report which delineates the method, documents the formatting process, and explains the attributes associated with the data. Record the time required to enter the data for the various methods. Compare the accuracy of the data resulting from the various methods in relation to the time expended to complete each method.

STEP 1 Document the method as it is being completed.

STEP 2 Record the amount of time expended to complete method.

STEP 3 Write a summary of each method to be transmitted to ECOMAPS at the interim target dates and final completion dates below.

TARGET DATES

Method A - October 31
Method B - December 31
Method C - February 28

3. PURPOSE

Install PC Arc/Info in the Division of Planning and Recreation Resources (DPRR).

STEP 1 Hire a P-14 Lead Computer Operator. (Target Date: August 1)

STEP 2 Install the software and get the PC on line for use of Arc/Info. (Target Date: August 10)

4. PURPOSE

Begin Training personnel to use Arc/Info.

STEP 1 Begin training of the P-14 through ECOMAPS. (Target Date: August 10)

STEP 2 Organize training of DCR staff to use Arc/Info. (Target Date: August 1)

STEP 3 complete training course for Arc/Info. (Target Dates: August 6 - October 5)

5. PURPOSE

Based on an evaluation of the three methods tested in this pilot project, develop and document the coordination mechanism for geographically referencing the Chesapeake Bay Area access data, existing beaches, state parks, cultural resource data, and the summary of Natural Heritage data for James City County/City of Williamsburg.

STEP 1 Document coordination between DCR divisions and COE's ECOMAPS.

STEP 2 Write a summary of the effectiveness of the coordination process used during this pilot project.

Interim Target Dates:

Method A - October 31
Method B - December 31
Method C - February 28

Final Target Date: February 28