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## Database of Inlet Navigation Projects and Structures

by Steven A. Hughes

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**PURPOSE:** The Coastal and Hydraulics Engineering Technical Note (CHETN) described herein provides information about the on-line database of tidal inlet navigation projects and structures available on the World Wide Web. The technical note describes the database content, overviews how to access the database with a web browser, and explains how to extract information from the database.

**DATABASE CONTENT:** The *Database of Inlet Navigation Projects and Structures* is a web-server-hosted database that is accessed via a customized web interface using any web browser program. No additional browser plug-ins are required. The database was developed by the Coastal Inlets Research Program (CIRP), and it contains over 1,230 individual records of navigation structures and tidal inlets located around the coast lines of the United States and its territories, including 330 records from the U.S. Great Lakes.

This Web-accessible database is based on U.S. Army Corps of Engineers data sets converted to electronic form in 1994 at the U.S. Army Engineer Research and Development Center (ERDC), Coastal and Hydraulics Laboratory (CHL). The three main data sources were the following:

- a. A list of 342 inlets for the continental U.S. (Barwis 1975)
- b. A list of 108 inlets along with associated tidal prism, cross-sectional area, and other information (Jarrett 1976)
- c. A database summarizing about 400 detailed breakwater and jetty case histories given in a series of nine reports written for the Repair, Evaluation, Maintenance, and Rehabilitation Research Program<sup>1</sup>

Other original data sources included National Ocean Service (NOS) Tide and Current Tables, and Corps of Engineers dredging records. The capability of including and viewing digital images of tidal inlets and navigation structures was added when the database was converted to a web-enabled application.

Each database record has data fields for various parameters related to the inlet or to the inlet structure. The data fields are grouped into three categories:

- a. *Geographic information.* Includes inlet or structure name, state and coast where located, and which Corps office has responsibility over the region.

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<sup>1</sup> O. P. Smith. (1989). "The U.S. Army Corps of Engineers database of coastal structures," unpublished report, U.S. Army Engineer Waterways Experiment Station, Vicksburg, MS.

- b. *Structure Parameters.* Data related to the inlet structures such as date built, structure length, crown elevation and width, core elevation, side slope, and jetty offset for dual-jetty systems.
- c. *Inlet Parameters.* Includes parameters related to the inlet such as project width and depth, tidal prism, throat cross-sectional area, bay surface area, ebb shoal volume, tide and current gauge locations, and maximum average flood and ebb currents and direction.

A description of each database field is included on a separate web page linked to the database web application. Many of the records are sparsely populated. This is typically due to lack of information for that particular site, but another reason is whether the record is for an inlet or an inlet structure. For example, a record for a natural inlet will not have any structure information, so those fields will be vacant. For some inlets there are records associated with inlet jetties, but no separate record for the inlet itself. In these cases the inlet parameters can be found in either one or both of the records for the jetty structures.

**ACCESSING THE DATABASE:** The *Inlets Database* can be accessed from the Web site of the *Coastal Inlets Research Program* (CIRP) located at the Uniform Resource Locator (URL)

<http://cirp.wes.army.mil/cirp/cirp.html>

under the menu item *Database of Inlet Navigation Projects and Structures* in the *Featured Links* section on the right side of the page. Clicking on this link brings up an introduction to the database in the browser window. Alternately, the database can be accessed directly at the URL

<http://cirp.wes.army.mil/cirp/structdb/structdbinfo.html>

The database introduction page contains two links.

The link *Access the Database* brings up the interactive database application as shown in Figure 1.

The link *Explanation of Database Fields* brings up the Web page describing the database fields and the three-letter codes assigned for the various coasts.

**STANDARD DATABASE QUERIES:** There are two simple *point and click* methods for selecting a subset of records from the database.

- a. *Rapid selection.* Clicking on one of the letters given in the “Rapid Selection” section as shown on Figure 1 will list all the records beginning with that letter. The records are sorted in alphabetical order. For example, to locate the record for *Barnegat Inlet*, click on the letter *B*.

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**Rapid Selection**

Click a letter to list all records beginning with that letter.

A B C D E F G H I J K L M  
N O P Q R S T U V W X Y Z

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**Detailed Selection**

Select By:  Coastal State:

Or By:  Corps Office:

Sort By:   Hint: Sort by "No. of Photographs" to see which inlets have photographs

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Welcome to the Database Query Page.  
Make your selection and click on 'Submit Query' button.

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Figure 1. Database initial menu

- b. *Detailed selection.* Using detailed selection is a little slower, but offers more options in selecting a subset of records. The two main options are selection by *State* (default) or selection by *Corps Office*. Clicking on the radio button changes between the two choices. Selections for specific states or Corps offices are made using the pull-down menus.

By default the selected subset of records are presented alphabetically by name, but several other options are offered in the *sorting* pull-down menu. After the selection has been made, click on the *Submit Query* button.

For example, Figure 2 shows a portion of a search for all records from South Carolina. The selected records are listed as hyperlinks underneath the selection menus. At any time another search for records can be initiated from the selection menu.

Individual records are accessed by clicking on the named link. For example, clicking on the *Breach Inlet* link in Figure 2 brings up the record for that inlet as shown (partially) in Figure 3. Initially, the values of dimensional parameters listed in the individual record are given in metric units. Clicking on the *English Units* button will redisplay the record with values converted to U.S. customary units.

**PHOTOGRAPHIC DATABASE:** The most useful extension to the original database is the capability of including digital photographs in individual records. Any record that includes web-viewable imagery has a camera icon behind the name as shown on Figure 2 for Breach Inlet. Photographs are accessed from the individual records by clicking on the provided link (see Figure 3). This brings up a table of available photographs as illustrated in Figure 4. Each row in the table provides a hyperlink for viewing the photograph and information about the image. Photos are listed in reverse chronological order. Clicking on a link displays the photo as shown in Figure 5. When viewing photographs, the arrows located in the upper right corner can be used to cycle through the list of photographs for that inlet (see Figure 5). Click on the *house* icon to return to the list of photos. Finally, to view the most recent photographs added to the database for all inlets, click on the *Most Recent Photo Additions* link at the top of the list (see Figure 4).

**UPLOADING PHOTOGRAPHS TO THE DATABASE:** Anyone accessing the database can upload inlet photographs in digital form if they wish to share their photographs with others. Contributing and sharing inlet images will make the inlets database a much more useful resource for planners, engineers, and researchers.

To upload an image from your computer hard drive, first locate the individual record for the inlet or structure that is to be associated with the image. Then click on the link next to *Upload an Image* (see Figure 3). This brings up the form shown in Figure 6. Fill out the form, and either type in the location and name of the image file, or use the *browse* button on the form to locate the image file on your computer's hard drive.

Because images viewable on the Internet can also be downloaded, it is important that you understand the rights that you are granting when uploading photographs. Equally important is the understanding that you have the right to grant others permission to download and use your images. In other words, **DO NOT** upload images without the permission of the copyright holder. For further information, click on the link *Photo Submission Guidelines* at the top of the screen. Supported image formats are GIF, JPEG, and PNG; and image size is provisionally limited to 200,000 bytes (this can be increased on request).

Uploaded photographs are previewed by the database manager before being made publicly viewable. This process is necessary to screen out inappropriate images.

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**Rapid Selection**   

Click a letter to list all records beginning with that letter.

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**Detailed Selection**

Select By:  Coastal State:

Or By:  Corps Office:

Sort By:   Hint: Sort by "No. of Photographs" to see which inlets have photographs

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**Selected Coastal\_State : SC**

**Sorted by: [ name ]**

Links showing icon  have photos available

- [Breach Inlet, SC](#) 
- [Calibogue Sound \(Haig Point\), SC](#)
- [Capers Inlet, SC](#)
- [Charleston Harbor \(south jetty\), SC](#)
- [Charlston Harbor \(north jetty\), SC](#)
- [Cherry Grove Inlet, SC](#)
- [Deweese Inlet, SC](#)
- [Frampton Inlet, SC](#)

Figure 2. Database records from South Carolina

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**Rapid Selection**   

Click a letter to list all records beginning with that letter.

---

**Detailed Selection**

Select By:  Coastal State:

Or By:  Corps Office:

Sort By:         Hint: Sort by "No. of Photographs" to see which inlets have photographs

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Name: **Breach Inlet**  
State: SC  
Corps Office: SAC  
Coast: ATL  
Link to 12 Photograph(s): [Click here](#)  
Upload an Image: [Click here](#)  
Record ID: 836

**Structure Parameters:**  
Year: 0

Figure 3. Database record for Breach Inlet, SC

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Database of Inlet Photographs and Imagery					
[ <a href="#">Inlets Database</a>   <a href="#">Most Recent Photo Additions</a> ]					
Inlet Name: <a href="#">Breach Inlet</a>					
State: SC					
Year	Viewpoint	Film Type	Photo Source	Image Title	Entry Date
1969	Overhead	Color	Scanned_Photo	<a href="#">Breach Inlet, SC 12-1969</a>	01 Aug 2000
1963	Overhead	Black/White	Scanned_Photo	<a href="#">Breach Inlet, SC 11-1963</a>	01 Aug 2000
1959	Overhead	Black/White	Scanned_Photo	<a href="#">Breach 10-1959</a>	31 Jul 2000
1959	Overhead	Color	Scanned_Photo	<a href="#">Breach 12-1969</a>	31 Jul 2000
1959	Overhead	Black/White	Scanned_Photo	<a href="#">Breach Inlet, SC 10-1959</a>	01 Aug 2000
1959	Overhead	Black/White	Scanned_Photo	<a href="#">Breach Inlet, SC 10-1959</a>	25 Aug 2000
1957	Overhead	Black/White	Scanned_Photo	<a href="#">Breach 03-1957</a>	31 Jul 2000
1954	Overhead	Black/White	Scanned_Photo	<a href="#">Breach Inlet, SC 11-1954</a>	01 Aug 2000
1953	Overhead	Black/White	Scanned_Photo	<a href="#">Breach Inlet, SC 3-27-1953</a>	01 Aug 2000
1953	Overhead	Black/White	Scanned_Photo	<a href="#">Breach Inlet, SC 11-1953</a>	01 Aug 2000
1949	Overhead	Black/White	Scanned_Photo	<a href="#">Breach Inlet, SC 3-3-1949</a>	01 Aug 2000
1941	Overhead	Black/White	Scanned_Photo	<a href="#">Breach Inlet, SC 11-1941</a>	01 Aug 2000
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Figure 4. List of photographs for Breach Inlet, SC

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[←](#) [Home](#) [→](#)

[ [Inlets Database](#) | [Most Recent Photo Additions](#) ]

## Breach Inlet, SC 10-1959



20 OCT 59 W 9099

This is an aerial photograph of Breach Inlet, South Carolina, taken in October 1959. The image shows a large inlet system with a grid overlay on the land area. The grid is composed of white lines forming a rectangular pattern over the land. The water is dark, and the land is light. The text '20 OCT 59 W 9099' is visible on the left side of the image.

Figure 5. Breach Inlet, SC

[ [Photo Submission Guidelines](#) ]

Upload an Image to the Inlet Photography Database	
Inlet Name: <a href="#">Breach Inlet</a>	
State: <b>SC</b> Inlet Database ID: 836	
<b>Title</b>	<input type="text"/>
<b>Image Description</b>	<input type="text"/>
<b>Submitter's Name</b>	<input type="text"/>
<b>Email Address</b>	<input type="text"/>
<b>Image</b>	<input type="text"/> <input type="button" value="Browse..."/>
<b>Image Details</b>	<input type="button" value="Viewpoint"/> <input type="button" value="Film Type"/> <input type="button" value="Photo Source"/> Year: <input type="text" value="Unkn"/> (if known)
<b>Permissions</b>	<input type="checkbox"/> <b>Click on this box if you agree with the statement below.</b> I understand that uploaded images become publicly available for viewing and downloading, and I grant the Corps of Engineers and all others my permission to use this image for noncommercial purposes. <a href="#">More Information</a> <b>All copyright privileges are retained by the original copyright holder.</b>
<input type="button" value="Submit Image and Description Now"/>	

Figure 6. Inlet photograph upload form

**CUSTOM DATABASE QUERIES:** Most users will access the information they need using the simple standard *point and click* form to query the database. However, more specific database queries can be performed by clicking on the link *Custom Database Queries* located near the top of the window. This brings up the form shown in Figure 7.

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### Custom Database Queries

Select up to four database fields (*Name* and *State* are automatically selected)

Not Selected  Not Selected  Not Selected  Not Selected

**Selection Criteria (Optional)** Select one or two

Where  Not Selected  Equals   Non-numeric input must be in quotes  
example: "CA" or "ATL"

And  Not Selected  Equals   Use upper case two-character Postal  
abbreviations for state selection

**Sorting Criteria (Optional)**

First Order By  Name  Ascending

Then Order By  Optional  Optional

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Figure 7. Custom database query form

The query form is divided into three sections.

- a. *Select fields.* These pull-down menus permit selection of up to four data fields contained in the database. (The fields *Name* and *State* are automatically included with all queries.)

- b. *Selection criteria.* One or two optional selection criteria can be specified using the pull-down menus and the entry forms. Examples are given in the table below.
- c. *Sorting criteria.* By default the selected records are sorted alphabetically by name, but it is possible to sort on any of the fields selected for the database query. Examples are given in the table.

<b>Table 1 Typical Custom Database Queries</b>		
<b>Select</b>	<b>Where</b>	<b>Order by</b>
Project depth	(Default)	Project depth, descending
Tidal prism, throat area	State equals "CA"	Throat area, descending
Tidal prism, throat area	Tidal prism does not equal 0	Tidal prism
Length	Length > 1000 and Length < 1500	Length, descending
(Default)	Name is like Ba%	(Default)
(Default)	Name is like %River%	(Default)

Notice the use of the *wildcard* symbol % in the last two examples shown in the table. The query containing *Ba%* will return information from all records with names beginning with *Ba*, whereas the query with *%River%* returns information from records where the word *River* appears anywhere in the name. Also notice in the input boxes that strings of letters, such as state and coast abbreviations, must have quotes around them, e.g., *CA* or *PAC*. Numbers do not need quotes.

After completing the custom query form, clicking on the *Submit Query* button reloads the page with the query results listed. A link is also provided for downloading a tab-delimited ASCII text file containing the query results. This text file can then be imported into most computer spreadsheets.

**Caution!** The custom query output results are *always* given in metric units with the exception of current speed which is given in knots. These are the units of the original data in the database.

**FUTURE PLANS AND ADDITIONS:** The Database of Inlet Navigation Structures and Projects is being actively extended by the Coastal Inlets Research Program to include additional capability and content. These future extensions include the following:

- *Comments section.* An interactive form will permit anyone with knowledge about a particular inlet or structure to upload specific comments much like a discussion forum. Comments will be reviewed by a knowledgeable moderator.
- *Documents section.* This section will contain electronic documents pertaining to specific inlets or projects. Uploading will be identical to photograph uploading. Uploaded file names will be listed with a short description of content and a link for downloading. No document files will be displayed because of the multitude of formats. Precautions are being developed to guard against the possibility of virus-infected uploaded files.

- *Literature section.* This is an online database of inlet literature references. Literature about a specific inlet will be accessible from that particular inlet record. General inlet references will be accessed from a special page with search, selection, and sorting options. Anyone wishing to contribute a literature citation will be able to enter the information from their web browser.

**DISCLAIMER:** Care has been taken to provide accurate information about the projects and structures included in this database. However, the Corps cannot accept any responsibility for the accuracy of any information retrieved from this database. Users are strongly advised to confirm all data using independent sources before undertaking any engineering designs or decisions that utilize any data values given in this database. Please report any errors to [Steven.A.Hughes@erdc.usace.army.mil](mailto:Steven.A.Hughes@erdc.usace.army.mil).

**ACKNOWLEDGEMENTS:** The original data used in this Web application was collected and entered into computer form in 1994 by Kurt Grove and Alison Bryant at ERDC, CHL. The web application was designed and coded by Steven Hughes, CHL, using the open source MySQL database and PHP scripting language. Ms. Erica Carr de Betts, University of Florida, scanned and uploaded the initial large collection of over 850 inlet photographs.

**ADDITIONAL INFORMATION.** Questions about this note can be addressed to Dr. Steven A. Hughes (Voice: 601-634-2026, Fax: 601-634-3433, e-mail: [Steven.A.Hughes@erdc.usace.army.mil](mailto:Steven.A.Hughes@erdc.usace.army.mil)). Another CIRP internet product, *Inlets Online* available from the [CIRP web page](#), provides histories and a tutorial on inlet processes. For information about the Coastal Inlets Research Program (CIRP), please contact the CIRP Technical Leader, Dr. Nicholas C. Kraus at [Nicholas.C.Kraus@erdc.usace.army.mil](mailto:Nicholas.C.Kraus@erdc.usace.army.mil). This note should be cited as follows:

Hughes, S. A. (2000). "Database of inlet navigation projects and structures," ERDC/CHL CHETN-IV-31, U.S. Army Engineer Research and Development Center, Vicksburg, MS. (<http://chl.wes.army.mil/library/publications/chetn>)

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