

Cumulative Ecological Significance of Oil and Gas Structures in the Gulf of Mexico: A Gulf of Mexico Fisheries Habitat Suitability Model

Phase II—User Manual



U.S. Department of the Interior
Minerals Management Service
Gulf of Mexico OCS Region

U.S. Department of the Interior
Geological Survey
Biological Resources Division

Cumulative Ecological Significance of Oil and Gas Structures in the Gulf of Mexico: A Gulf of Mexico Fisheries Habitat Suitability Model Phase II—User Manual

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INTRODUCTION

The USGS Biological Resources Division Gulf of Mexico Ecosystem Model was developed by LGL Ecological Research Associates, Inc. using Habitat Evaluation Program (HEP) techniques to produce maps and tables that can be displayed in ArcView 2.1, a powerful, easy-to-use tool that brings geographic information to the desktop. Many parts of this user manual that relate to ArcView functions come from the HELP files supplied with ArcView.

ArcView is made by Environmental Systems Research Institute (ESRI), the makers of ARC/INFO.

Working Spatially

ArcView can be used by anyone who wants to work spatially. A key feature of ArcView is that it's easy to load tabular data, such as dBASE files and data from database servers, into ArcView so that you can display, query, summarize, and organize this data geographically.

Views

With ArcView you work with geographic data in interactive maps called views. Every view features ArcView's unique geographic 'Table of Contents', making it easy to understand and control what's displayed. Each component of the HEP model includes one view, with the species being modeled, depth contours, platform locations, and MMS lease block areas available to be displayed.

Tables

Underlying tables accompany each modeled species (themes in ArcView). You can work with the tabular data for any theme by clicking the Tables... element under the Theme menu. Click on features on a view, and their records highlight in the table showing you their attributes. Select records in the table and the features they represent highlight on the view. ArcView's tables also have a full range of features for obtaining summary statistics, sorting and querying. They can also be printed.

Charts

ArcView's charts offer a powerful graphics and data visualization capability that is fully integrated into ArcView's geographic environment. You can simply click on features on a view to add them to the chart. ArcView lets you work simultaneously with geographic, tabular and chart

representations of your data. No prepared charts are included in the HEP model projects.

Layouts

ArcView's layouts let you create high quality, full color maps by first arranging the various graphic elements on-screen the way you want them. You'll get great looking results on a wide range of printers and plotters. Layouts are smart because they have a live link to the data they represent. When you print a layout, any changes to the data are automatically included, so you know everything on your map will be up-to-date. Each HEP model project includes two standardized layouts; an introduction page that displays upon opening the project, and a layout for printing the active themes of the project.

Scripts

ArcView scripts are macros written in Avenue, ArcView's programming language and development environment. Several scripts are included with the HEP model, including the startup script, which configures the project to look the same upon opening each time, and the button scripts to automatically query the model themes to display only modeled polygons, and to set the legend of the model theme to a standard format.

Projects

Two ArcView projects are included in the HEP model: adult.apr and juvenile.apr. Each of the projects is all-inclusive and includes the model themes, tables and layouts for that version of the model.

Spatial data

Spatial data is at the heart of every ArcView application. Spatial data is geographic data that stores the geometric location of particular features, along with attribute information describing what these features represent. The coastline, depth contours, Federal lease areas, and species modeled themes in the HEP model projects are all ARC/INFO coverages that have been added to the view.

Tabular data

Tabular data can include almost any data set, whether or not it contains geographic data. What you can do with a table in ArcView depends on what it contains. Some tables can be displayed on a view directly, others provide additional attributes that can be joined to your existing spatial data. The Platform theme in the HEP model project is an event theme that is displayed based on the comma separated values file included with the projects.

USING THE MODEL

Here are some of the key tasks you can accomplish with ArcView.

Display ARC/INFO Data on a View

Turning themes on and off

You can control which themes are drawn in your view by simply turning them on or off. Use the check box that's next to a theme in the Table of Contents to turn the theme on or off.

Changing the order themes are drawn in

Simply drag themes up and down in the Table of Contents to change the order they are drawn in. The theme at the top of the Table of Contents is drawn on top of those below it. Put themes that form the background to your view at the bottom of the Table of Contents.

Zooming

There are several ways to zoom in and out on a view. In addition to zooming in and out with the zoom tools, you can zoom in on particular themes. You can also automatically zoom in on the geographic features that you select on a view.

View scale

As you zoom in and out on your view, ArcView always shows you its current scale. You can also specify the scale you wish to use for your view directly, as an alternative to zooming in and out manually.

Panning around a view

Using the Pan tool, simply drag the view display to pan around.

Display Tabular Data on a View

You can import tabular data and then join it to the data in a view to display it geographically.

Use SQL to retrieve records from a database and display them on a view

You can connect to a database to get a tabular data and then work with it geographically.

Geocode tables containing addresses and display them on a view

Any tabular data containing the addresses of facilities, etc. can be displayed on a view as points. ArcView geocodes this data in order to add it to a view.

Find the attributes of any features on a view

You can click on features on a view to display their attributes.

Select features according to their attributes

You can query a view to find particular features.

Summarize the attributes of features

For example, you can summarize data for cells on a regional or other basis. You can also generate statistics about any attributes.

Select features based on their proximity to other features

Find places where certain features coincide

Layout a map and print it

An ArcView project can contain any number of layouts.

To see which layouts are in a project

Click on the Layouts icon on the Project window. The layouts in the current project are shown in the list.

To create a new layout

With the Layouts icon selected, click the New button at the top of the Project window. ArcView creates a new layout and its name will appear in the list of layouts in the project. ArcView names new layouts in numerical order: Layout1, Layout2, Layout3, etc. You can also double-click the Layouts icon to create a new layout.

To open a layout

Double-click the layout's name in the list of layouts in the Project window, or select the layout's name and click the Open button.

To close a layout

From the File menu, choose Close, or click the close option on the layout's window (This option varies according to the GUI you are using).

To rename a layout

Click once on the layout in the list in the Project window and choose Rename from the Project menu. A layout's name is also a layout property you can edit.

To save the work you do with a layout

In ArcView, you save the work you do with any project component by saving the project. To save your project, choose Save Project from the File menu or click the Save Project button in the Layout button bar.

To copy a layout from one project to another

If you want to copy a layout from another project into your current project, you should import the other project into your current one using Import in the Project menu. This will copy all the components of the other project into your current project. You can then delete the components that you don't require using Delete from the Project menu.

Layout a map and export it for use in another program

Map layouts can be exported to various file formats.

Navigating the model screen

Locations of buttons, tool bars, and menu bars are provided in Figure 1. Of special note are the two buttons located immediately after the disk icon on the button bar. The first button, marked with a "Q" icon will recreate the correct query for the selected theme, to display only modeled cells. The second button, marked with a paint brush, will restore the legend of the selected theme to four equal units of HSI colored from gray to red.

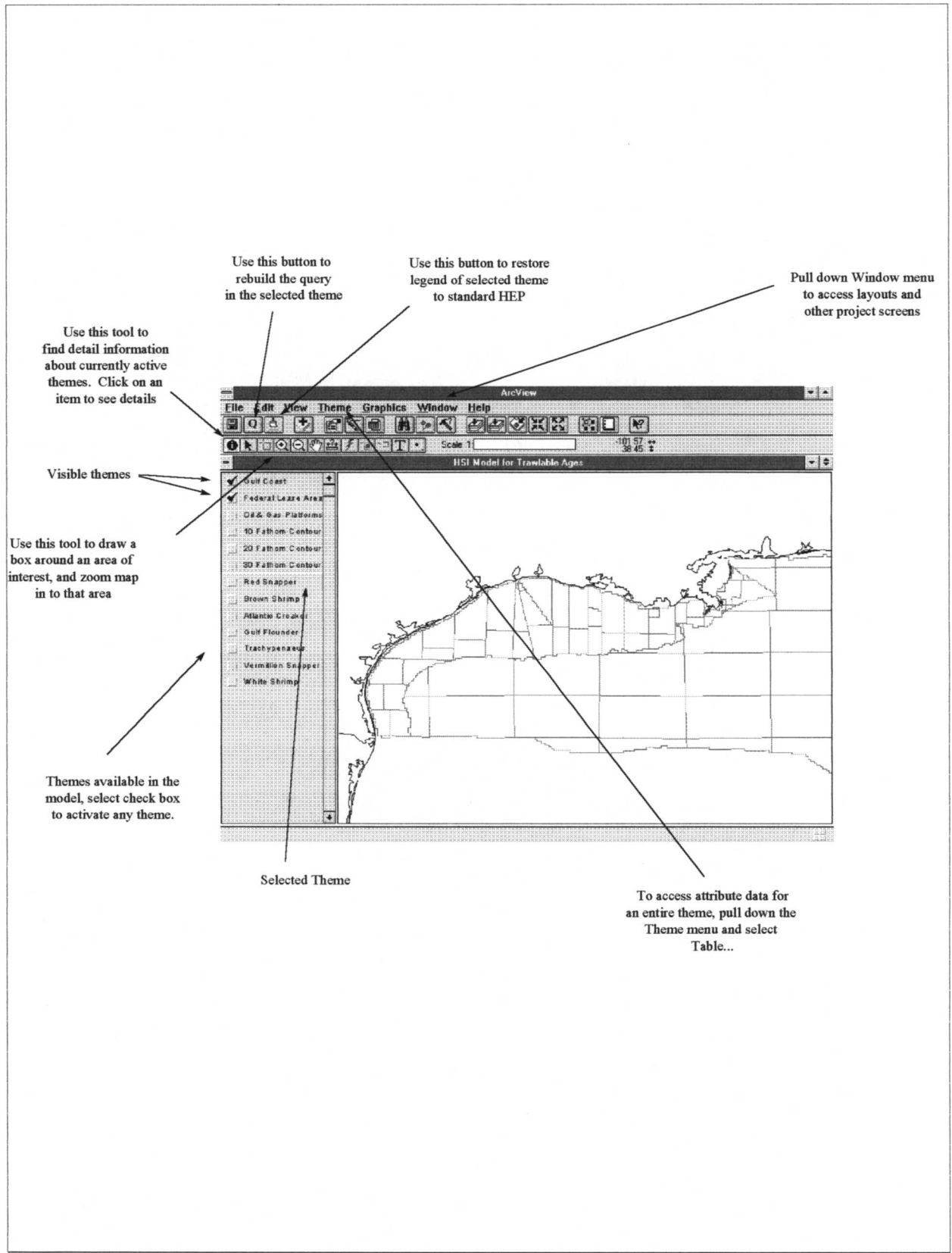


Figure 1. Navigating the Model Screen

CONTENTS OF THE ADULT MODEL

The adult.apr project comes with one view (Habitat Suitability Indices for Adult Reef Fish), one table (allplat.csv), and two layouts (Introduction, and Layout1). The view includes twelve themes for display:

Theme	Description
Gulf Coast	ARC/INFO coverage of the coastline of the Gulf of Mexico
Federal Lease Areas	ARC/INFO coverage of Federal lease areas obtained from MMS
Oil and Gas Platforms	ArcView event theme created from the text file allplats.csv, included operator name, lat/lon and lease block information
10 Fathom contour	ARC/INFO coverage providing the approximate location of the 10 fathom depth contour
20 Fathom contour	as above
30 Fathom contour	as above
Red Snapper	HEP model for adult <i>Lutjanus Campechanus</i>
Other Snapper	HEP model for all snapper other than red snapper as identified by fishermen in David Stanley's research
Cobia	HEP model for fish identified as cobia
Triggerfish	
Grouper	HEP model for all species identified as grouper
Amberjack	

Columnar data in the attributes table for any of the model themes describe the characteristics of a modeled cell, and the HSI calculations for the cell. The content of each of the columns is described below. Surface dwelling species include model values for surface temperature and surface salinity; bottom dwelling species use bottom temperature and bottom salinity.

LATDD. Represents the latitude coordinate of the upper left hand corner of the modeled ten minute square cell.

LONDD. Represents the longitude coordinate of the upper left hand corner of the modeled ten minute square cell.

HA_ID. An internal number used to uniquely identify a model cell and allow it to be matched with the corresponding polygon in the ARC/INFO coverage that represents all sampled cells.

DFATHS. The 10 fathom range where the mean value of all depth observations within the modeled cell occurs. The descriptor is the mid-point of the range (*i.e.*, value of 10 represents range of 5 fathoms to 15 fathoms).

PLATCNT. Number of platforms located in the modeled cell.

HANGCNT. Number of hangs (calculated from the Texas A & M Sea Grant hang location file) located in the modeled cell.

DEADCNT. The number of years during the last eleven years that the modeled cell has been included in the mapped dead zone.

RELIDX. Suitability index value to importance of relief at a particular depth on species of interest within a modeled cell. This can be used to calculate the value of each platform in a modeled cell for the species of interest, as the depth/relief component of the final HSI for any cell is calculated as the relationship of the natural log of (the platform count plus one-half of the hang count multiplied times this value) divided by the highest occurring such value for any modeled cell.

SPPVAL. Platform count plus one-half of the hang count times the relidx value.

LSPPVAL. Natural log of sppval variable plus 1.

HSI. Habitat Suitability Index for the species of interest in the modeled cell.

Columns unique to pelagic fish:

SURTMP. Mean value of all surface temperature observations within the modeled cell.

SURSAL. Mean value of all surface salinity observations within the modeled cell.

STMPIDX. Surface temperature suitability index value.

SSALIDX. Surface salinity suitability index value.

Columns unique to bottom fish:

BOTTMP. Mean value of all bottom temperature observations within the modeled cell.

BOTSAL. Mean value of all bottom salinity observations within the modeled cell.

BTMPIDX. Bottom temperature suitability index value.

BSALIDX. Bottom salinity suitability index value.

The table `allplat.csv` holds information about platforms located in the Western Gulf of Mexico. The data held in each record include the latitude and longitude coordinates of the platform location, operator of the platform, lease block area and number, and the platform identifier.

CONTENTS OF THE JUVENILE MODEL

The juvenile.apr project comes with one view (Habitat Suitability Indices for Trawlable Ages), one table (allplat.csv), and two layouts (Introduction, and Layout1). The view includes thirteen themes for display:

Theme	Description
Gulf Coast	ARC/INFO coverage of the coastline of the Gulf of Mexico
Federal Lease Areas	ARC/INFO coverage of Federal lease areas obtained from MMS
Oil and Gas Platforms	ArcView event theme created from the text file allplats.csv, included operator name, lat/lon and lease block information
10 Fathom contour	ARC/INFO coverage providing the approximate location of the 10 fathom depth contour
20 Fathom contour	as above
30 Fathom contour	as above
Red Snapper	HEP model for juvenile <i>Lutjanus campechanus</i>
Brown Shrimp	HEP model for all ages of <i>Penaeus aztecus</i>
White Shrimp	HEP model for all ages of <i>Penaeus setiferus</i>
Vermilion Snapper	HEP model for juvenile <i>Rhomboplites aurorubens</i>
Trachypenaeus	HEP model for all ages of <i>Trachypenaeus</i>
Atlantic Croaker	HEP model for juvenile <i>Micropogonias undulatus</i>
Gulf Flounder	HEP model for juvenile <i>Paralichthys albigutta</i>

Columnar data in the attributes table for any of the model themes provide each of the suitability indices used to calculate the final HSI of a modeled cell, as well as the HSI value for the cell. The content of each of the columns is described below.

SALIDX. Suitability index value corresponding to the mean value of all bottom salinity observations within the modeled cell.

LATDD. Represents the latitude coordinate of the upper left hand corner of the modeled cell.

LONDD. Represents the longitude coordinate of the upper left hand corner of the modeled cell.

PLATSI. Suitability index based on the range (groups of 5) within which the number of platforms in the modeled cell falls.

HANGSI. Suitability index based on the range (groups of 10) within which the number of hangs in the modeled cell falls.

DEADSI. Suitability index based on the number of years the cell has been located in a dead zone area during the last 11 years.

DPZSI. Suitability index based on the mean 10 fathom depth range of all observations within the modeled cell.

TMPSI. Suitability index component based on the mean value of all observations of bottom temperature in the modeled cell.

HSI. Habitat Suitability Index for the species of interest in the modeled cell.

HA_ID. An internal number used to uniquely identify a model cell and link it to ARC/INFO polygons of modeled cells.

CONTENTS OF THE PLATFORM ASSESSMENT MODEL

The assess.apr project comes with one view (Red Snapper Assessment), one table (allplat.csv), and one layout. The view includes 10 themes for display:

Theme	Description
Gulf Coast	ARC/INFO coverage of the coastline of the Gulf of Mexico
Federal Lease Areas	ARC/INFO coverage of Federal lease areas obtained from MMS
Oil and Gas Platforms	ArcView event theme created from the text file allplats.csv, included operator name, lat/lon and lease block information
10 Fathom contour	ARC/INFO coverage providing the approximate location of the 10 fathom depth contour
20 Fathom contour	as above
30 Fathom contour	as above
Red Snapper - Current HSI values	HEP model for adult red snapper based on platforms in place as of 1995
Red Snapper - HSI values in 1986	HEP model for adult red snapper based on platforms in place in 1995 plus platforms removed between 1986 and 1994
Platform Assessment Model	HEP model for red snapper with larger emphasis on value of platforms to allow calculation of cost of removal and value of addition
Removed Platforms	Display of platforms removed from model cells from 1986 to 1994

Columnar data in the attributes table for any of the model themes provide each of the suitability indices used to calculate the final HSI of a modeled cell, as well as the HSI value for the cell. The content of each of the columns is described below.

LATDD. Represents the latitude coordinate of the upper left hand corner of the modeled ten minute square cell.

LONDD. Represents the longitude coordinate of the upper left hand corner of the modeled ten minute square cell.

HA_ID. An internal number used to uniquely identify a model cell and allow it to be matched with the corresponding polygon in the ARC/INFO coverage that represents all sampled cells.

DFATHS. The 10 fathom range where the mean value of all depth observations within the modeled cell occurs. The descriptor is the mid-point of the range (*i.e.*, value of 10 represents range of 5 fathoms to 15 fathoms).

PLATCNT. Number of platforms located in the modeled cell.

HANGCNT. Number of hangs (calculated from the Texas A & M Sea Grant hang location file) located in the modeled cell.

DEADCNT. The number of years during the last eleven years that the modeled cell has been included in the mapped dead zone.

RELIDX. Suitability index value to importance of relief at a particular depth on species of interest within a modeled cell. This can be used to calculate the value of each platform in a modeled cell for the species of interest, as the depth/relief component of the final HSI for any cell is calculated as the relationship of the natural log of (the platform count plus one-half of the hang count multiplied times this value) divided by the highest occurring such value for any modeled cell.

SPPVAL. Platform count plus one-half of the hang count times the relidx value.

LSPVAL. Natural log of sppval variable plus 1.

HSI. Habitat Suitability Index for the species of interest in the modeled cell.

BOTTMP. Mean value of all bottom temperature observations within the modeled cell.

BOTSAL. Mean value of all bottom salinity observations within the modeled cell.

BTMPIDX. Bottom temperature suitability index value.

BSALIDX. Bottom salinity suitability index value.

Additional columns restricted to the theme Red Snapper HSI Values in 1986:

REM86 through REM94. The number of platforms removed from a model cell for each of the years 1986 - 1994.

TOTREM. Total platforms removed from a cell during 1986 - 1994.

REMSPP. The same calculation as SPPVAL, made with the removals added back.

LREMSPP. The natural log of REMSPP + 1.

OLDHSI. Where this variable is included it represents the HSI values for the cell after removal of all platforms.

STDPIDX. The ratio of the LREMSPP to the maximum occurring value of LREMSPP.

Additional columns occurring in the Platform Assessment Model theme:

SUITFACT. This factor represents the approximate value of a single platform to the model cell. When multiplied by the number of platforms and one-tenth the number of hangs in a cell it produces CELLVAL.

CELLVAL. This is the raw value of the underlying habitat components in the assessment model.

GOODCELL. This value is one-half the value of optimum habitat. HSI is calculated as a ratio of CELLVAL to twice GOODCELL, up to a value of 1.

HOWMANY. This factor represents the number of platforms that may be removed from a model cell before the cell will move to the next lower quarter of HSI values. For cells in the bottom quarter this value is by definition the total number of platforms in the cell.

The table allplat.csv holds information about platforms located in the Western Gulf of Mexico. The data held in each record include the latitude and longitude coordinates of the platform location, operator of the platform, lease block area and number, and the platform identifier.

Calculation of new habitat values for any model cell can be completed using the underlying values of the attribute table for a cell. For each platform removed, the user should subtract one unit of SUITFACT from the value of CELLVAL, then compare the result to twice the value of GOODCELL. If the ratio is greater than 1, it should be rounded to 1, otherwise the ratio is the predicted HSI value for the cell.

ORACLE TABLES OF SUITABILITY INDICES

Appendix 1 provides table and column descriptions for each of the habitat model suitability indexes for the seven species subject to trawling and the six adult reef fish species included in the models.

Columns are similar in each of the modeled species, differing between adult and trawlable, and surface and bottom dwelling members of the adult models.

Common Name	Oracle Table	Description	Scientific Name	Biocode
Amberjack	Amberj_ad_hsi	Adult Amberjack - Surface		
Brown Shrimp	br_shrimp_hsi	Brown shrimp - trawl model	<i>Penaeus aztecus</i>	228010701
Cobia	cobia_ad_hsi	Adult Cobia - Surface		
Atlantic Croaker	croak_juv_hsi	Juvenile croaker	<i>Micropogonias undulatus</i>	170201902
Gulf Flounder	floun_juv_hsi	Juvenile flounder	<i>Paralichthys albigutta</i>	183012401
Grouper	grouper_ad_hsi	Adult grouper - bottom		
Other Snapper	othsnap_ad_hsi	Adult snapper other than red snapper - bottom		
Red Snapper	redsnap_ad_hsi	Adult red snapper - bottom		
Red Snapper	rs_juv_hsi	Juvenile red snapper	<i>Lutjanus campechanus</i>	170151107
Blood Shrimp	trachy_hsi		<i>Trachypenaeus</i>	228011800
Triggerfish	trigger_ad_hsi	Adult Triggerfish		
Vermilion Snapper	vsnap_juv_hsi	Juvenile vermilion snapper	<i>Rhomboplites aurorubens</i>	170152001
White Shrimp	wh_shrimp_hsi	White shrimp - trawl model	<i>Penaeus setiferus</i>	228010705

Columns for surface adult reef fish:

LATDD. Represents the latitude coordinate of the upper left hand corner of the modeled cell.

LONDD. Represents the longitude coordinate of the upper left hand corner of the modeled cell.

HA_ID. An internal number used to uniquely identify a model cell.

SURTMP. Mean value of all surface temperature observations within the modeled cell.

SURSAL. Mean value of all surface salinity observations within the modeled cell.

DFATHS. The 10 fathom range where the mean value of all depth observations within the modeled cell occurs.

PLATCNT. Number of platforms located in the modeled cell.

RELIDX. Suitability index value to importance of relief at a particular depth on species of interest within a modeled cell. This can be used to calculate the value of each platform in a modeled cell for the species of interest, as the depth/relief component of the final HSI for any cell is calculated as the relationship of the natural log of (the platform count plus one-half of the hang count multiplied times this value) divided by the highest occurring such value for any modeled cell.

SPPVAL. Platform count plus one-half of the hang count times the relidx value.

LSPPVAL. Natural log of sppval variable plus 1.

HSI. Habitat Suitability Index for the species of interest in the modeled cell.

STMPIDX. Surface temperature suitability index value.

SSALIDX. Surface salinity suitability index value.

Columns for bottom adult reef fish:

LATDD. Represents the latitude coordinate of the upper left hand corner of the modeled cell.

LONDD. Represents the longitude coordinate of the upper left hand corner of the modeled cell.

HA_ID. An internal number used to uniquely identify a model cell.

BOTTMP. Mean value of all bottom temperature observations within the modeled cell.

BOTSAL. Mean value of all bottom salinity observations within the modeled cell.

DFATHS. The 10 fathom range where the mean value of all depth observations within the modeled cell occurs.

PLATCNT. Number of platforms located in the modeled cell.

RELIDX. Suitability index value to importance of relief (combination of platforms and hangs) on species of interest within a modeled cell.

SPPVAL. Platform count plus one-half of the hang count times the relidx value.

LSPPVAL. Natural log of sppval variable plus 1.

HSI. Habitat Suitability Index for the species of interest in the modeled cell.

BTMPIDX. Bottom temperature suitability index value.

BSALIDX. Bottom salinity suitability index value.

Columns for trawlable species model:

SALIDX. Suitability index value for the mean value of all salinity observations within the modeled cell.

LATDD. Represents the latitude coordinate of the upper left hand corner of the modeled cell.

LONDD. Represents the longitude coordinate of the upper left hand corner of the modeled cell.

PLATSI. Suitability index based on count of platforms in the modeled cell.

HANGSI. Suitability index based on count of hangs in the modeled cell.

DEADSI. Suitability index based on the number of times the cell has been located in a dead zone area during the last 11 years.

DPZSI. Suitability index based on the mean depth of all observations within the modeled cell.

TMPSI. Suitability index component based on the mean value of all observations of bottom temperature in the modeled cell.

HSI. Habitat Suitability Index for the species of interest in the modeled cell.

HA_ID. An internal number used to uniquely identify a model cell.

APPENDIX 1
ORACLE TABLES

ORACLE Tables:

<u>TABLE NAME</u>	<u>COLUMN NAME</u>	<u>DATA TYPE</u>
AMBERJ_AD_HSI	LATDD	NUMBER
	LONDD	NUMBER
	HA_ID	NUMBER
	SURTMP	NUMBER
	SURSAL	NUMBER
	DFATHS	NUMBER
	PLATCNT	NUMBER
	RELIDX	NUMBER
	SPPVAL	NUMBER
	LSPVAL	NUMBER
	HSI	NUMBER
	STMPIDX	NUMBER
	SSALIDX	NUMBER
BR_SHRIMP_HSI	SALIDX	NUMBER
	LATDD	NUMBER
	LONDD	NUMBER
	PLATSI	NUMBER
	HANGSI	NUMBER
	DEADSI	NUMBER
	DPZSI	NUMBER
	TMPSI	NUMBER
	HSI	NUMBER
	HA_ID	NUMBER
COBIA_AD_HSI	LATDD	NUMBER
	LONDD	NUMBER
	HA_ID	NUMBER
	SURTMP	NUMBER
	SURSAL	NUMBER
	DFATHS	NUMBER
	PLATCNT	NUMBER
	RELIDX	NUMBER
	SPPVAL	NUMBER
	LSPVAL	NUMBER
	HSI	NUMBER
	STMPIDX	NUMBER
	SSALIDX	NUMBER

<u>TABLE NAME</u>	<u>COLUMN NAME</u>	<u>DATA TYPE</u>
CROAK_JUV_HSI	SALIDX	NUMBER
	LATDD	NUMBER
	LONDD	NUMBER
	PLATSI	NUMBER
	HANGSI	NUMBER
	DEADSI	NUMBER
	DPZSI	NUMBER
	TMPSI	NUMBER
	HSI	NUMBER
HA_ID	NUMBER	
FLOUN_JUV_HSI	SALIDX	NUMBER
	LATDD	NUMBER
	LONDD	NUMBER
	PLATSI	NUMBER
	HANGSI	NUMBER
	DEADSI	NUMBER
	DPZSI	NUMBER
	TMPSI	NUMBER
	HSI	NUMBER
HA_ID	NUMBER	
GROUPER_AD_HSI	LATDD	NUMBER
	LONDD	NUMBER
	HA_ID	NUMBER
	BOTTMP	NUMBER
	BOTSAL	NUMBER
	DFATHS	NUMBER
	PLATCNT	NUMBER
	RELIDX	NUMBER
	SPPVAL	NUMBER
	LSPVAL	NUMBER
	HSI	NUMBER
	TMPSI	NUMBER
	BTMPIDX	NUMBER
BSALIDX	NUMBER	

<u>TABLE NAME</u>	<u>COLUMN NAME</u>	<u>DATA TYPE</u>
OTHSNAP_AD_HSI	LATDD	NUMBER
	LONDD	NUMBER
	HA_ID	NUMBER
	BOTTMP	NUMBER
	BOTSAL	NUMBER
	DFATHS	NUMBER
	PLATCNT	NUMBER
	RELIDX	NUMBER
	SPPVAL	NUMBER
	LSPVAL	NUMBER
	HSI	NUMBER
	TMPSI	NUMBER
	BTMPIDX	NUMBER
BSALIDX	NUMBER	
REDSNAP_AD_HSI	LATDD	NUMBER
	LONDD	NUMBER
	HA_ID	NUMBER
	BOTTMP	NUMBER
	BOTSAL	NUMBER
	DFATHS	NUMBER
	PLATCNT	NUMBER
	RELIDX	NUMBER
	SPPVAL	NUMBER
	LSPVAL	NUMBER
	HSI	NUMBER
	TMPSI	NUMBER
	BTMPIDX	NUMBER
BSALIDX	NUMBER	
RS_JUV_HSI	SALIDX	NUMBER
	LATDD	NUMBER
	LONDD	NUMBER
	PLATSI	NUMBER
	HANGSI	NUMBER
	DEADSI	NUMBER
	DPZSI	NUMBER
	TMPSI	NUMBER
	HSI	NUMBER
	HA_ID	NUMBER
TRACHY_HSI	SALIDX	NUMBER
	LATDD	NUMBER
	LONDD	NUMBER
	PLATSI	NUMBER
	HANGSI	NUMBER
	DEADSI	NUMBER
	DPZSI	NUMBER
	TMPSI	NUMBER
	HSI	NUMBER
	HA_ID	NUMBER

<u>TABLE NAME</u>	<u>COLUMN NAME</u>	<u>DATA TYPE</u>
TRIGGER_AD_HSI	LATDD	NUMBER
	LONDD	NUMBER
	HA_ID	NUMBER
	SURTMP	NUMBER
	SURSAL	NUMBER
	DFATHS	NUMBER
	PLATCNT	NUMBER
	RELIDX	NUMBER
	SPPVAL	NUMBER
	LSPVAL	NUMBER
	HSI	NUMBER
STMPIDX	NUMBER	
SSALIDX	NUMBER	
VSNAP_JUV_HSI	SALIDX	NUMBER
	LATDD	NUMBER
	LONDD	NUMBER
	PLATSI	NUMBER
	HANGSI	NUMBER
	DEADSI	NUMBER
	DPZSI	NUMBER
	TMPSI	NUMBER
	HSI	NUMBER
	HA_ID	NUMBER
WH_SHRIMP_HSI	SALIDX	NUMBER
	LATDD	NUMBER
	LONDD	NUMBER
	PLATSI	NUMBER
	HANGSI	NUMBER
	DEADSI	NUMBER
	DPZSI	NUMBER
	TMPSI	NUMBER
	HSI	NUMBER
	HA_ID	NUMBER



The Department of the Interior Mission

As the Nation's principal conservation agency, the Department of the Interior has responsibility for most of our nationally owned public lands and natural resources. This includes fostering sound use of our land and water resources; protecting our fish, wildlife, and biological diversity; preserving the environmental and cultural values of our national parks and historical places; and providing for the enjoyment of life through outdoor recreation. The Department assesses our energy and mineral resources and works to ensure that their development is in the best interests of all our people by encouraging stewardship and citizen participation in their care. The Department also has a major responsibility for American Indian reservation communities and for people who live in island territories under U.S. administration.



The Minerals Management Service Mission

As a bureau of the Department of the Interior, the Minerals Management Service's (MMS) primary responsibilities are to manage the mineral resources located on the Nation's Outer Continental Shelf (OCS), collect revenue from the Federal OCS and onshore Federal and Indian lands, and distribute those revenues.

Moreover, in working to meet its responsibilities, the **Offshore Minerals Management Program** administers the OCS competitive leasing program and oversees the safe and environmentally sound exploration and production of our Nation's offshore natural gas, oil and other mineral resources. The MMS **Minerals Revenue Management** meets its responsibilities by ensuring the efficient, timely and accurate collection and disbursement of revenue from mineral leasing and production due to Indian tribes and allottees, States and the U.S. Treasury.

The MMS strives to fulfill its responsibilities through the general guiding principles of: (1) being responsive to the public's concerns and interests by maintaining a dialogue with all potentially affected parties and (2) carrying out its programs with an emphasis on working to enhance the quality of life for all Americans by lending MMS assistance and expertise to economic development and environmental protection.