Coastal Impact Assistance Program

Documentation on Spatial Data and Methods

Last revised: April 24, 2001.

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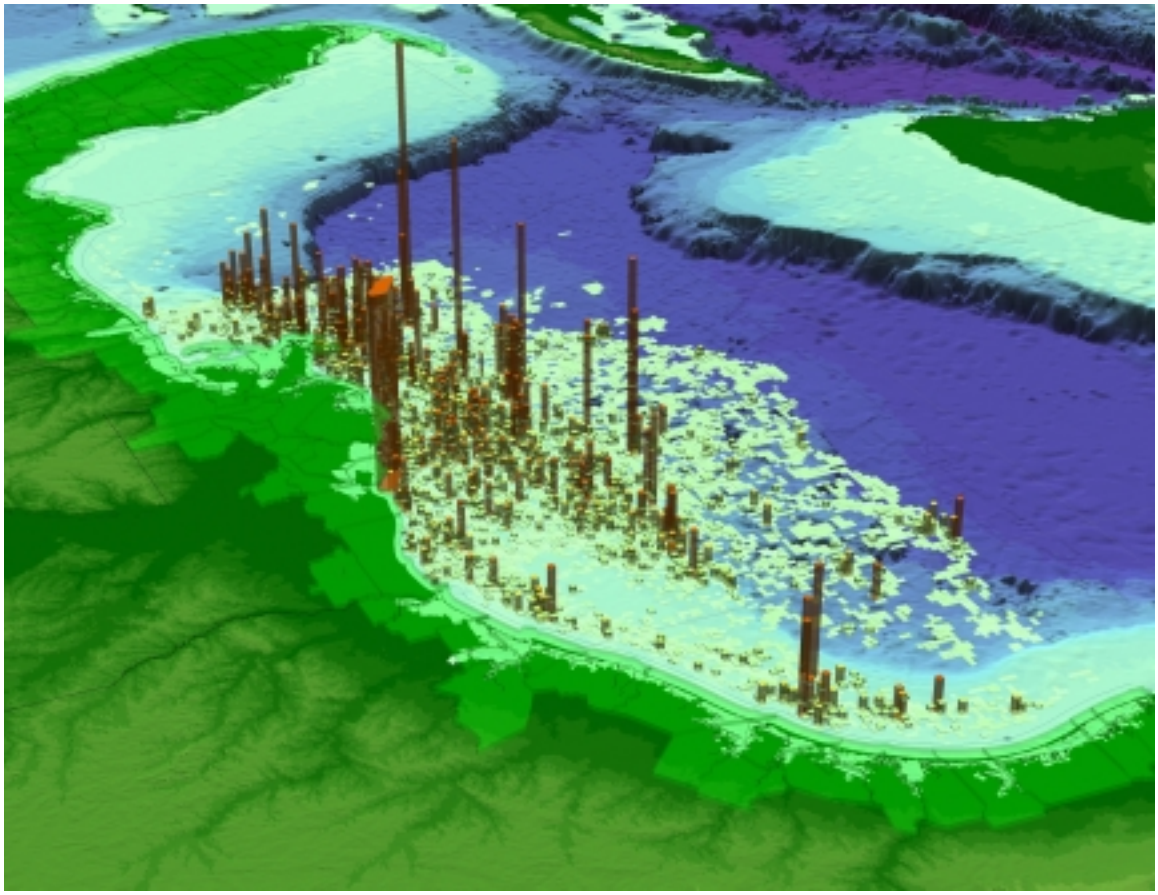
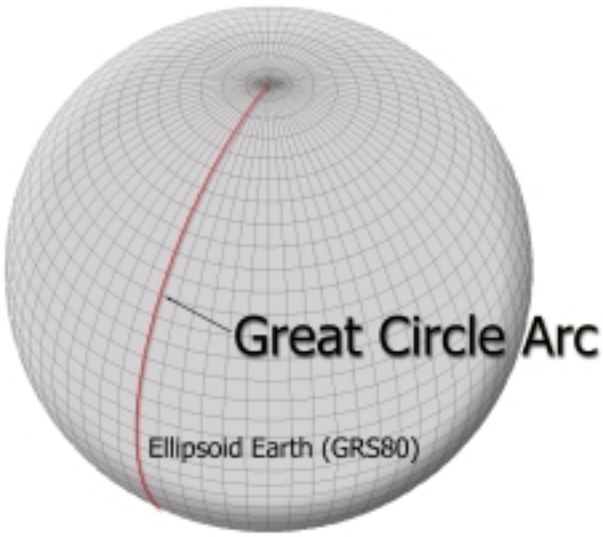
This documentation is a draft version intended solely as a description of certain aspects behind the spatial data and processing for the Coastal Impact Assistance allocations. Please direct your comments or questions on the allocations to John King at (301) 713-3155 x188 or john.king@noaa.gov.



Map showing revenue generated from leased tracts in the Gulf of Mexico (vertical height represents dollars), and coastal political subdivisions. View is the Gulf Coast of the United States looking towards the southeast.

Part1: Spatial Calculations

1. Great Circle Distance Calculation



Explanation

The shortest distance between two points is a straight line. On a three-dimensional spherical object like the earth the shortest distance between two points is a curving line called the great circle arc. Calculating great circle distance on a sphere can be done using a formula in spherical trigonometry. The standard formula from Snyder (1987:30) is the length of great circle (c) between two points (lat1, long1 and lat2, long2 in radians, where X is the difference in longitude) on a sphere:

$$c = \arccos [(\sin(lat1) * \sin(lat2)) + (\cos(lat1) * \cos(lat2) * \cos(X))].$$

However, the earth is not a perfect sphere like a billiard ball. It is more of a flattened ellipsoid, like an orange. There can be a significant difference in using a perfect sphere versus an earth-like ellipsoid to calculate great circle distance. We chose the GRS80 ellipsoid to reflect the NAD83 datum. The length (Lr) of 1 radian on the GRS80 ellipsoid at mean latitude YR, where a is the equatorial radius and e^2 the polar flattening, is (Snyder, 1987:24):

$$Lr = a * (1 - e^2) / (1 - e^2 * \sin^2 (YR))^{3/2}$$

We used these equations in a computer program written especially for the Coastal Impact Assistance calculations and derived a series of great circle distances in radians which we then converted to statute miles.[i]

Quality Control on Distance Calculations

Allocations to Producing Coastal States, Calculation, *in Sec. 31 (d) (1) (B) (2)*

In many cases, the great circle between a leased tract and the closest point on the coastline of a state crossed over land or another state's jurisdiction. For instance, the great circle between a leased tract in the western Gulf and the State of Mississippi crosses a good portion of Louisiana, which was to be expected.

In the case of inshore points in western Mississippi, had we used a mean lower low water (MLLW) line instead of the MMS baseline, the result would have been an increase in Mississippi's state allocation at the expense of other states (with the exception of Louisiana and Texas, which probably would not have been affected because of the 25% cap on state allocations as described in "Allocations to Producing Coastal States," Part (B)). The rationale for selecting the MMS baseline, instead of a MLLW coastline, is explained below in the MMS baseline description (see also figure in MMS baseline description).

We plan to review the final results against the NOAA medium-resolution MHW (Mean High Water) shoreline, for our own comparative purposes only, in order to judge how the use of one digital file versus another can affect the overall result in terms of dollars. At the time of this writing, these comparisons have not yet been completed. We know that in a few instances, such as on the Texas coast, there are points on the MHW line that are slightly seaward of points on the MMS baseline. The assumption is that the NOAA medium-resolution digital shoreline is dated, whereas the MMS baseline has been updated to reflect the ambulatory nature of coastline and certain points "fixed" by law.

Payments to Coastal Political Subdivisions, *in Sec. 31 (d) (3) (C)*

In "Payments to Coastal Political Subdivisions," Part (B), the phrase "coastal political subdivision" – not "coastline" – is used. Unlike for the states, we calculated great circle distance from the geographic center of leased tracts to the nearest point in the "coastal political subdivision," not to the nearest point on the "coastline." In some cases, the nearest point in the coastal political subdivision was a not a point on or near the coastline, but an interior point on the backside or edge of an eligible county's border.

There was no consistent set of digital files representing Coastal Political Subdivisions to compare with our results using TIGER/Line 2000. The U.S. Census has published caveats about the use of TIGER/Line files for highly accurate measurements (see excerpt below, full metadata available in endnotes).

> The information present in these files is provided for the purposes of statistical analysis and census operations only. Coordinates in the TIGER/Line files have six implied decimal places, but the positional accuracy of these coordinates is not as great as the six decimal places suggest. The positional accuracy varies with the source materials used, but generally the information is no better than the established national map Accuracy standards for 1:100,000-scale maps from the U.S. Geological Survey (USGS); thus it is NOT suitable for high-precision measurement applications such as engineering problems, property transfers, or other uses that might require highly accurate measurements of the earth's surface.

Accuracy and precision standards were set in the Coastal Impact Assistance program to the nearest statute mile thus well within the standards of the Bureau of the Census in their TIGER 2000 digital files.

2. Coastline Length Calculation

Explanation

For the Gulf of Mexico states and California, we intersected the NOAA medium-resolution shoreline with the Census TIGER 2000 county land and water boundary file. For Alaska, we intersected the Alaska 1 to 63,360 coastline with the Census TIGER 2000 land and water boundary file, which we had to adapt somewhat to represent special Alaskan coastal political subdivisions. We dissolved the coastline file by county and calculated coastline length using the appropriate state plane coordinate system for the area of the state, following a general procedure of the Minerals Management Service (Thormahlen, 1999).[ii] In Alaska, we used the same Albers Conical Equal Area projection in which the 1 to 63,360 coastline was provided. All spatial processing was done in ArcView GIS.

Quality Control on Coastline Length Calculations

The Alaska coastline file, supplied by the State of Alaska, was originally in NAD27. Attempts to convert it to NAD83 using the NADCON extension in ArcView failed for reasons that are not entirely clear, but may have to do with the size and complexity of the file and areas west of 180 degrees out of range of NADCON grids. We recognize that using NAD83 TIGER 2000 files to clip an NAD27 Alaska coastline is not an ideal solution. There may be positional shift of up to 300 meters. However, given the vast extent of Alaskan coastline and issues of variable coastline resolution in the data itself (see metadata), it is not expected that a datum shift would significantly affect the overall allocation estimates to Alaskan coastal political subdivisions.

Other consistent estimates of coastline length, by county, were not readily available to check our results.

3. NAD27 to NAD83 Datum Transformation

In the Gulf of Mexico, MMS baseline points and MMS leased tract centroids were converted from NAD27 to NAD83 using an Avenue implementation of the NOAA NADCON conversion program. NADCON is the Federal standard for NAD27 to NAD83 datum transformations (Federal Register, Volume 55, Number 155 dated August 10, 1990).[iii]

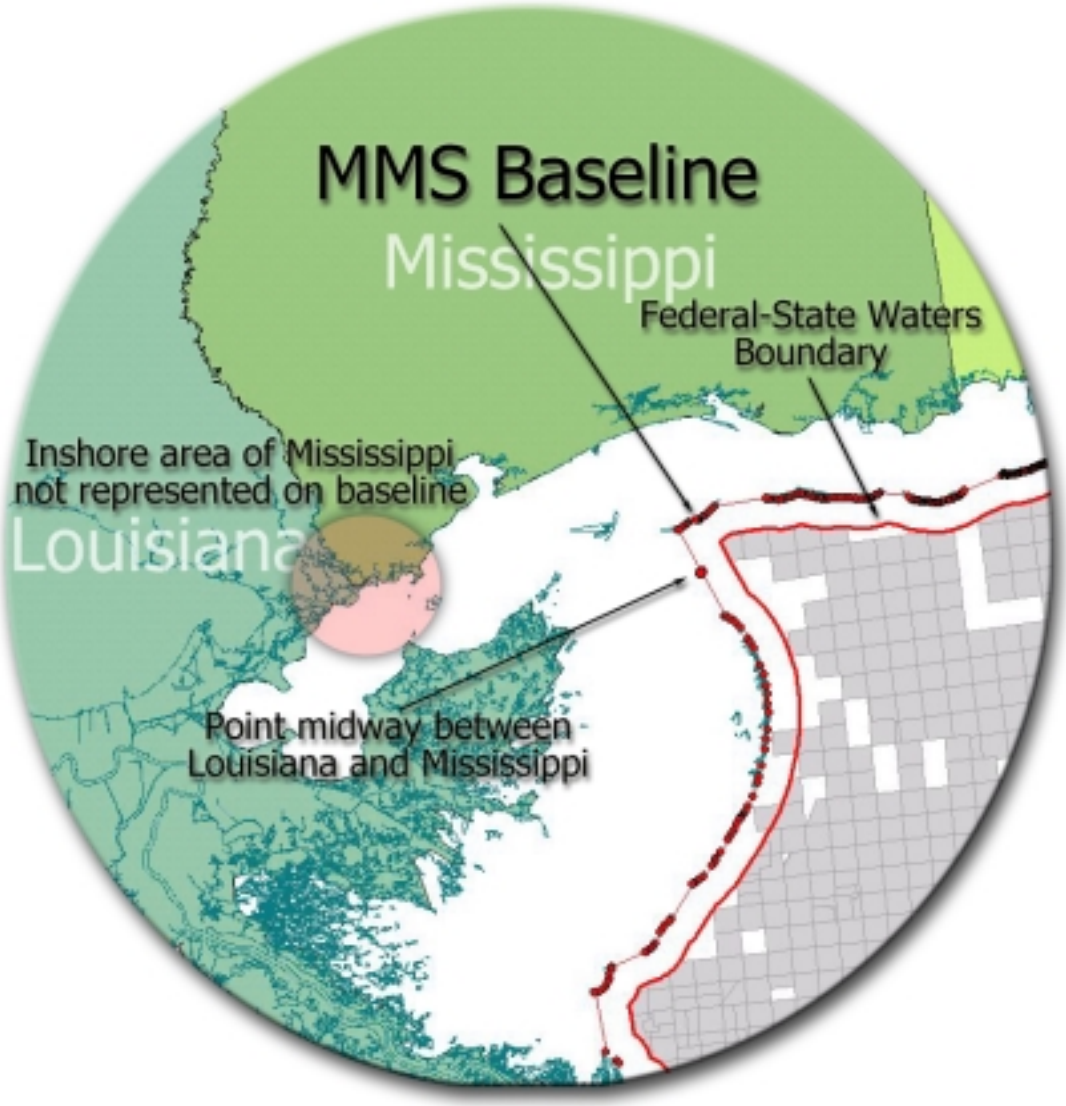
An attempt to convert the datum of the Alaska coastline from NAD27 to NAD83 was unsuccessful (see description above).

Part2: Spatial Data Behind the Calculations

1. Minerals Management Service (MMS) Baseline

Distributed By: Minerals Management Service, Mapping and Boundary Branch[iv]

Ellipsoid: Clarke 1866 Converted to GRS80 by NOAA
Coordinate System: Geographic
Datum: NAD27 Converted to NAD83 by NOAA
Projection: Geographic



Description

The MMS baseline is a set of 1) isolated points, and 2) points connected by lines, representing the mean lower low water (MLLW) line in direct contact with the open sea or marking the seaward limit of open water. Isolated points usually represent rocks, small islands, irregular coastlines, etc. Points connected by lines represent larger islands, uniform stretches of coastline, river and bay closing lines, etc.

Source

The Minerals Management Service interprets "the line of ordinary low water along that portion of the coast which is in direct contact with the open sea and the line marking the seaward limit of inland waters" (43 U.S.C. 1301(c)), to be the same as the mean lower low water (MLLW) line depicted on National Ocean Service nautical charts (Thormahlen, 1999). Cartographers from MMS generally use appropriate large-scale NOAA nautical charts to select isolated points and straight-line segments. Supplemental source materials included hydrographic and topographic survey sheets, photogrammetry, and conventional surveys. Points were submitted to the appropriate state(s) for verification and concurrence (see Thormahlen, 1999)[v].

Role in Calculation

We used this file to represent "coastline" for calculating the great circle distance between the nearest point on the coastline of a producing coastal state and the geographic center of leased tracts, as described in "Allocations to Producing Coastal States," Part (B).

Explanation

We did not use a complete MLLW coastline for the state allocation calculation. There are two rationales for doing this. The first and most important reason is that there *is* no complete digital MLLW coastline for the entire Gulf of Mexico, California and Alaska. The MMS baseline is a subsample of the MLLW coastline, representing only the furthest offshore points or bay closing lines from which a federal-state waters boundary line can be defined. Ordinarily, segments of a MLLW coastline winding up into inland bays and rivers would not represent the nearest points on the coastline to a leased tract. There were important exceptions, however, such as the State of Mississippi's western edge (see also figure and great circle distance discussion above). It is hoped that measures will be taken to make a digital MLLW coastline available, as it will be needed to satisfy any future directives from Congress calling for this kind of calculation to be done.

Our second rationale for using the MMS baseline is founded on the definition of "coastline" in the Submerged Lands Act, "the line of ordinary low water along that portion of the coast which is in direct contact with the open sea and the line marking the seaward limit of inland waters" (43 U.S.C. 1301(c)). This definition, subject to a legal interpretation that is not offered here, may exclude inshore points such as those in western Mississippi.

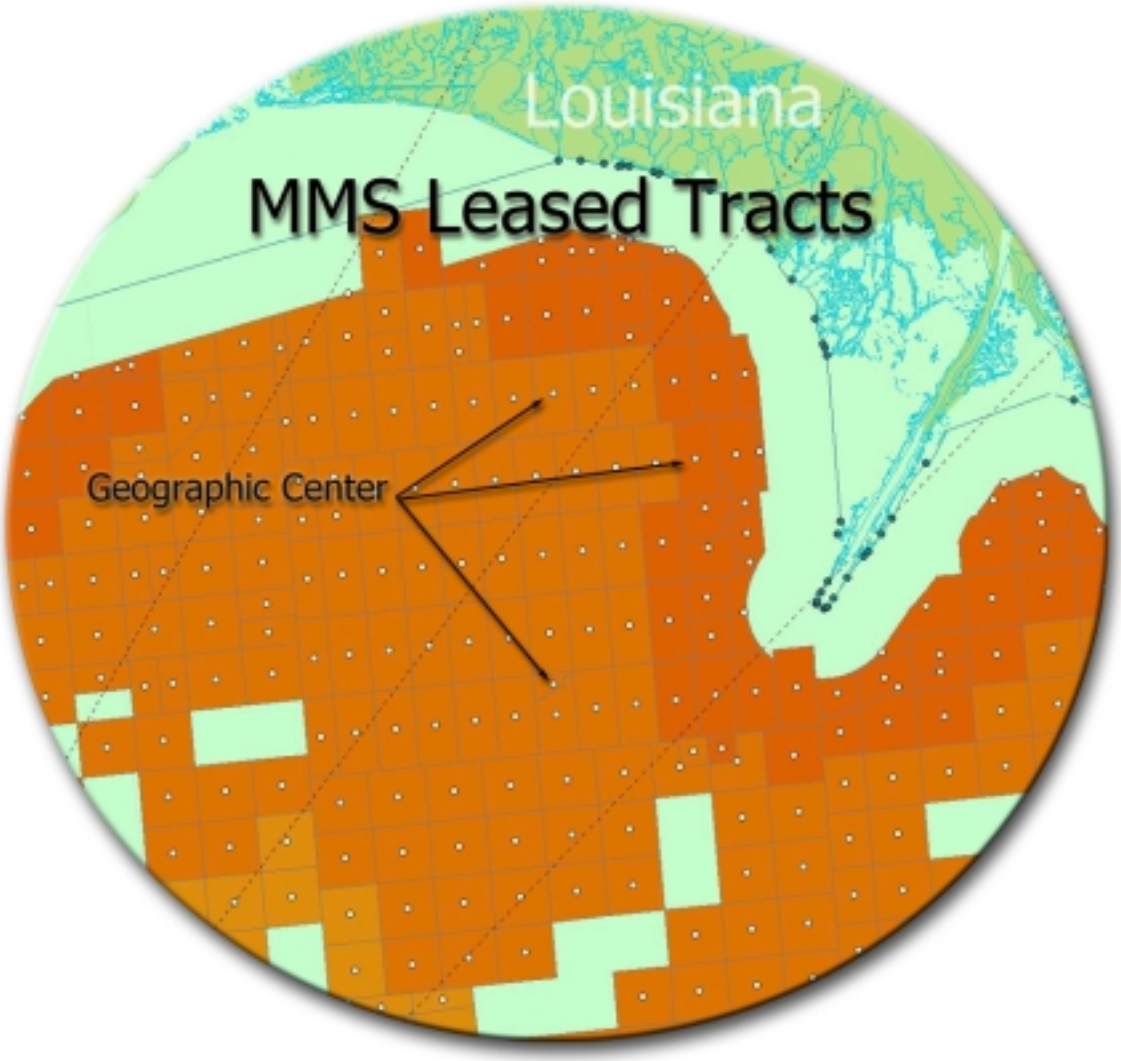
Finally, for the purposes of providing these estimates only, we selected a point on the MMS baseline midway between Louisiana and Mississippi to represent the lateral state waters boundary. We picked this midway point because it represents a general precedent in international law; but we did not intend to resolve or set a precedent for future discussions between the State of Louisiana and the State of Mississippi about where their state waters lie.

2. Minerals Management Service (MMS) Leased Tracts

Distributed By: Minerals Management Service

Gulf of Mexico and California
Ellipsoid: Clarke 1866 Converted to GRS80 by NOAA
Coordinate System: Geographic
Datum: NAD27 Converted to NAD83 by NOAA
Projection: Geographic

Alaska
Ellipsoid: GRS80
Coordinate System: Geographic
Datum: NAD83
Projection: Geographic



Description

A digital file of offshore leased tracts and their geographic centers. Only eligible leased tracts were included in the subset provided by MMS.

Source

The latitude-longitude coordinates for geographic centers of offshore leased tracts were calculated by MMS. See the metadata for MMS baseline (above).

Role in Calculation

We used this file to represent 'leased tract' in order to calculate the distance between the nearest point on the coastline and the geographic center of leased tracts in "Allocations to Producing Coastal States," Part (B).

Explanation

There is no other reasonable digital source for leased tracts.

3. Bureau of the Census TIGER/Line Files, Redistricting Census 2000

Distributed By: Bureau of the Census[vi]

Ellipsoid: NA
Coordinate System: Geographic
Datum: NAD83
Projection: Geographic

Description

The geographic coverage for the TIGER/Line 2000 file represents counties or statistically equivalent entities in the United States and Puerto Rico, based on January 1, 2000 legal boundaries.

Source

The sources of the TIGER files are 1:100,000 US Geological Survey (USGS) topographic maps scanned by USGS for the Census Bureau. For major urban areas, Census substituted the GBF/DIME files created in the 1970s (with updates from 1981 to 1985). The TIGER data base has been updated with information from local officials and from fieldwork by Census staff. However, these updates were done without any geodetic controls.

Role in Calculation

We used this file to represent "coastal political subdivision" to calculate the great circle distance between the point in the coastal political subdivision closest to the geographic center of leased tracts in "Payments to Coastal Political Subdivisions," Part (B).

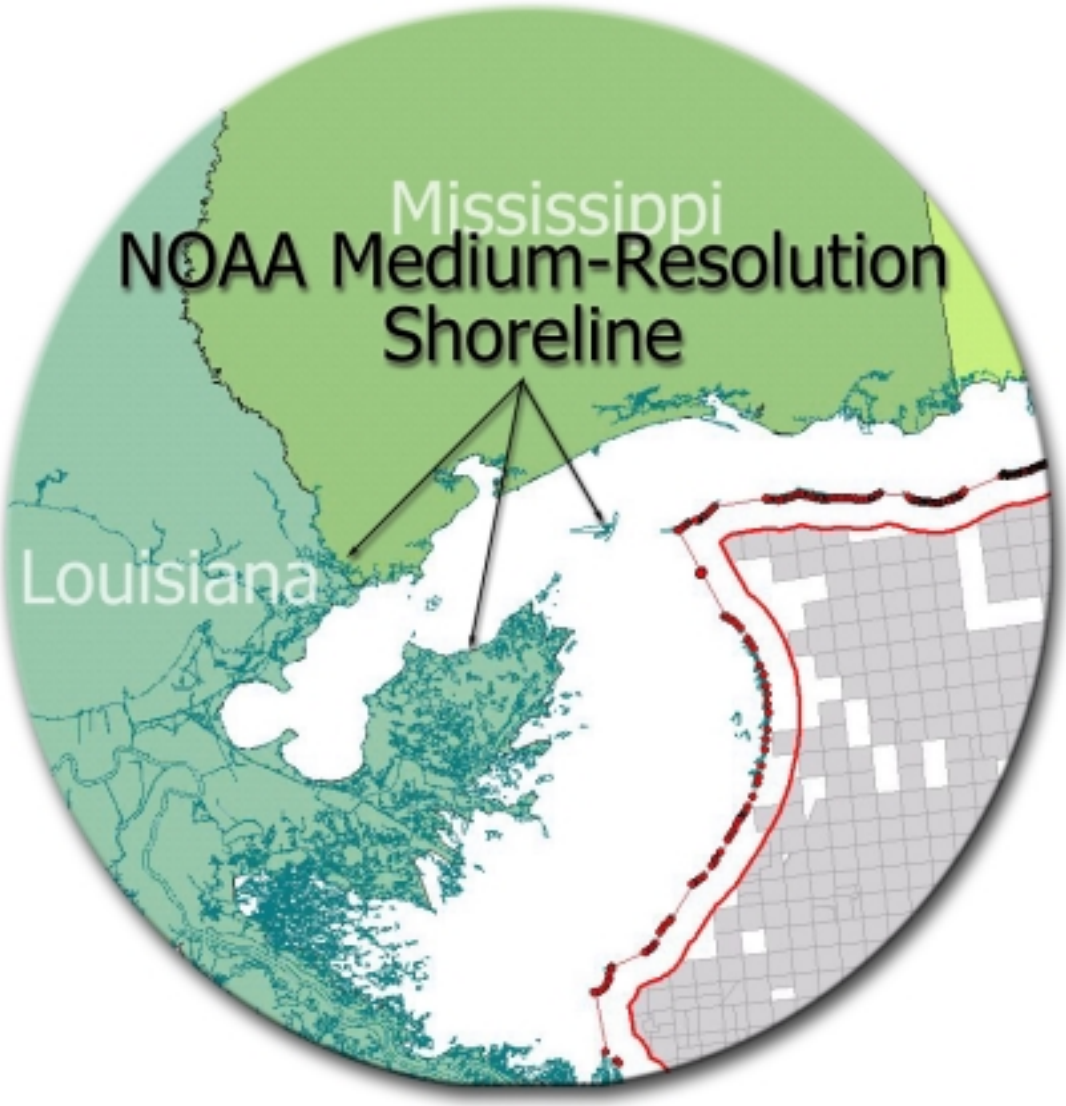
Explanation

In "Payments to Coastal Political Subdivisions," Part (B), the phrase "coastal political subdivision" – not "coastline" – is used (see discussion of great circle distance above).

4. National Oceanic and Atmospheric Administration (NOAA) Medium-Resolution Shoreline

Distributed By: NOAA Special Projects Office[vii]

Ellipsoid: GRS80
Coordinate System: Geographic
Datum: NAD83
Projection: Geographic



Description

The Mean High Water (MHW) shoreline as depicted on NOAA nautical charts.

Source

Digitized from NOAA nautical charts, generally 1:80,000 NOAA charts took precedence. For areas where 1:80,000 charts were not readily available, charts with the next largest scale (e.g., 1:60,0000) were used up to the largest scale available. If larger scale nautical charts were not available, charts of the next smallest scale (e.g., 1:100,000) were used down to the smallest scale. The digital shoreline for Florida was obtained from the state. Alaska, the Hawaiian Islands, Puerto Rico, and all other interests and territories of the United States are not included.

Role in Calculation

We used this file to represent “coastline” to calculate coastline miles (except in Alaska) in “Payments to Coastal Political Subdivisions,” Part (B).

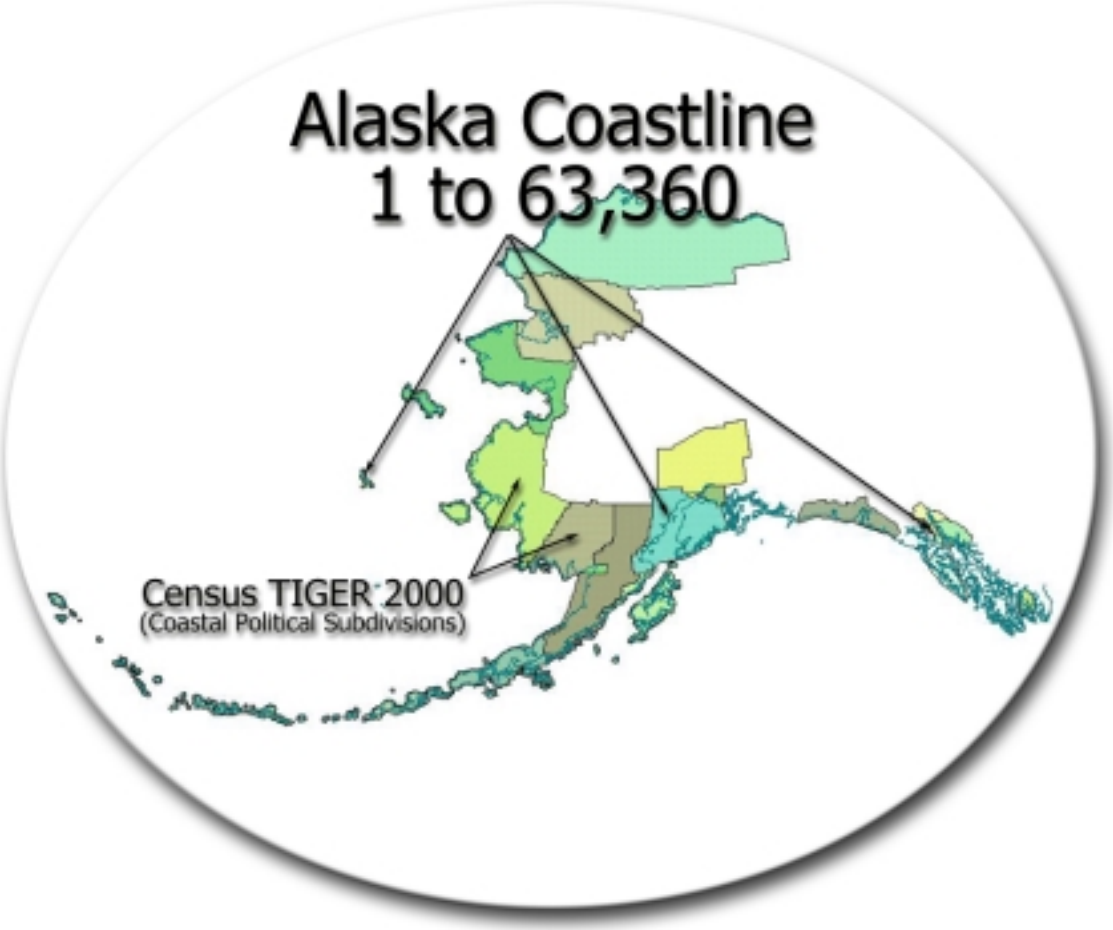
Explanation

There is no complete digital MLLW coastline for the Gulf of Mexico, California and Alaska (see MMS baseline explanation above). The MMS baseline is a series of point and points connected by lines representing only a small sample of the entire MLLW line (see description of MMS baseline above). For the purpose of computing total coastline length, where segments of coast winding up into inland bays and rivers would be included, the most consistent and best available digital coastline is the NOAA MHW shoreline.

5. Alaska Coastline 1 to 63,360

Distributed By: Alaska Department of Natural Resources, State of Alaska[viii]

Ellipsoid: Clarke 1866
Coordinate System: Geographic
Datum: NAD27
Projection: Albers Conical Equal Area (see metadata)



Description

The file is a “1:63,360” coastline for the State of Alaska where data was available as of January 1998. Where unavailable the 1:250,000 coastline was used to fill in.

Source

The source data were USGS 1:63,360 topographic maps ranging in date from the 1950's to the 1990's that were subsequently photo revised by the Bureau of Land Management, and a mixture of sources including Department of Natural Resources Land Records Information Section hydrography database, Exxon Valdez Oil Spill Environmentally Sensitive Index coastline, US Geologic Survey hydrography, and the US Forest Service (in Prince William Sound).

Role in Calculation

We used this file to represent “coastline” in order to calculate coastline miles for Alaska political subdivisions only in “Payments to Coastal Political Subdivisions,” Part (B).

Explanation

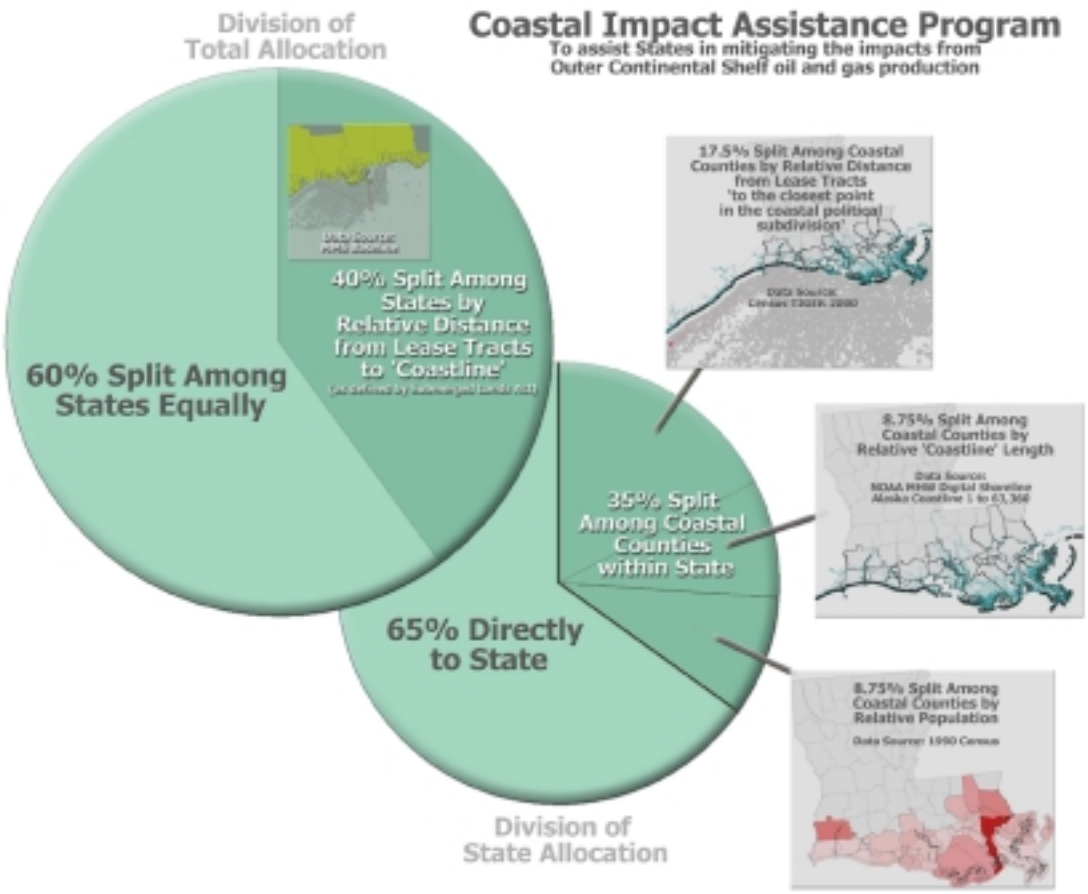
The Alaska coastline 1 to 63,360 is roughly comparable to the NOAA medium-resolution shoreline in terms of spatial resolution, and represents the best digital coastline available for the state.

Part 3: Transforming Spatial Calculations into Dollar Allocations

The following are notes describing the mathematical operations that were used to transform input from spatial calculations into dollar allocations, according to the terms of the Coastal Impact Assistance amendment.

(Individual tables have been put in parenthesis for reference purposes)

1. Formula Summary



Graphical summary of Coastal Impact Assistance Program allocations.

Total Allocation

A. Legislation calls for distribution of $150,000,000.00 distributed to 7 oil and gas producing states with qualified OCS lease tracts:

- Alaska
- California
- Texas
- Louisiana
- Mississippi
- Alabama
- Florida

B. Across the board 0.22% recission in all appropriations ($149,670,670.00)

C. 5.0% for program administration ($142,186,500.00)

State Allocations

A. 60% of the total allocation ($142,186,500.00) split equally between the 7 states ($85,311,900.00 total @ $12,187,414.285 per state))

B. 40% of the total allocation divided among the 7 states based on their proximity to eligible OCS lease tracts within 200 miles of their coastline and the total revenue of these lease tracts for the period of beginning Jan 1, 1995 and ending Dec. 31, 2000 ($56,874,600.00)

C. No one state can receive more than 25% ($14,218,650.00) of this 40% share of the overall appropriation

Local Allocations

A. 65% of the state's allocation stays at the state level

B. 35% of the state's allocation is divided among the coastal counties (as defined by CZMA) as follows:

25% based on ratio of coastal county population to total population for all coastal counties in state

25% based on ratio of coastal county shoreline length to total shoreline length for all coastal counties within the state

50% based on coastal county proximity to OCS lease tracts used to determine state allocation

Exception – a coastal county in CA that is farther than 200 miles from the nearest lease tract and contains a coastline and one or more oil refineries should be treated as if that coastal county were 50 miles from the nearest lease tract

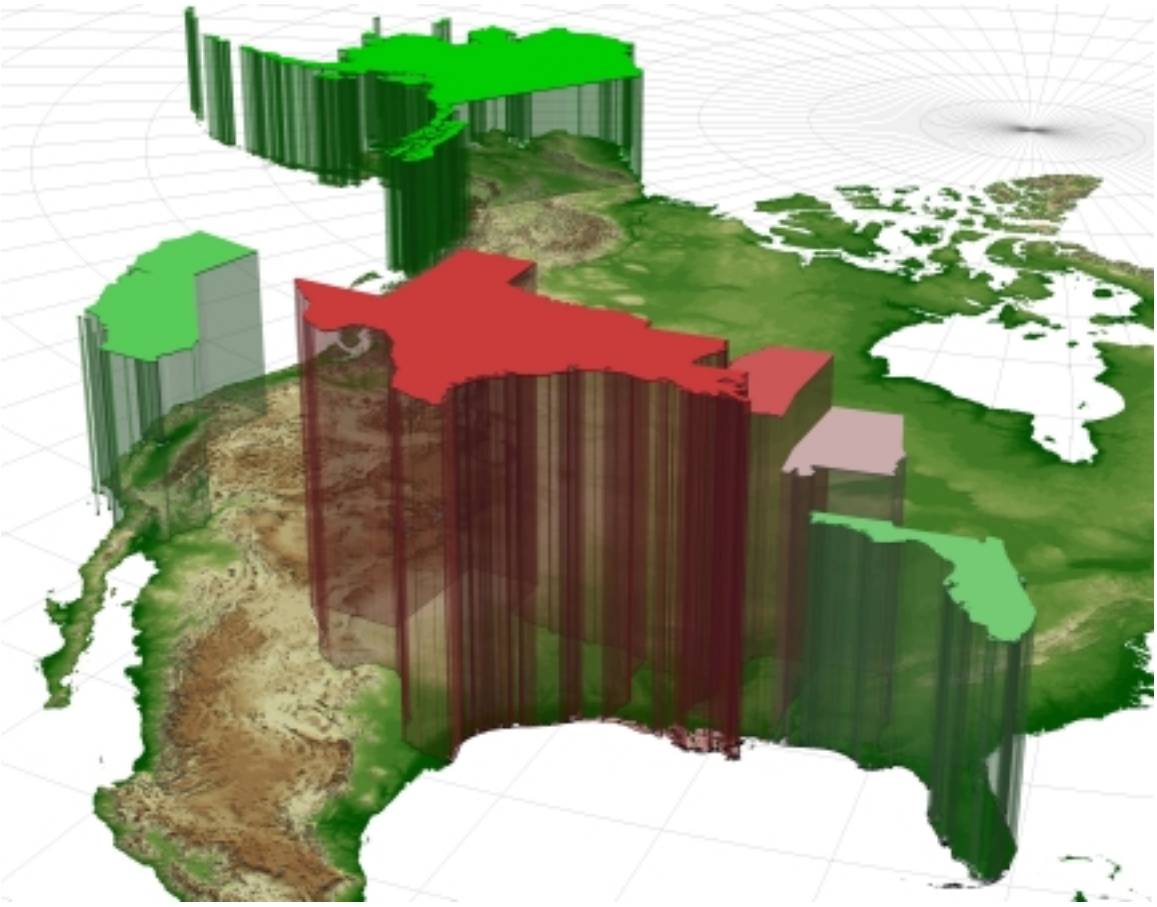
Info Needs

OCS revenue data from MMS for all eligible leases
Minimum distance values from each lease centroid to each state
Minimum distance values from each lease centroid to each county/parish/borough
Shoreline length of each county/parish/borough
1990 population for each coastal county/parish/borough
Those counties in CA that have oil refineries and a coastline (Solano and Contra Costa)

Allocation Formula Details (see CIAP Allocations SQL.doc)

2. State Allocations

(see Ex. Allocation Formula for State Distance Calculations.xls)



Map showing estimated state allocations (vertical height represents dollars). *Note: vertical scale is not the same as in the county map.*

Step 1. Determined for each lease tract what the maximum distance (within 200 miles) was to all states (Max_Distance_View)

Lease # 001: distance to TX 20, LA 40, MS 80, AL 160 , FL 320;
so max = 160 (note: 200 mile limit in state allocation formula)

Step 2. The formula calls for the revenue (ex. Lease #001 = $2M) to be applied to each state as a function of how close it is to a particular lease tract, therefore it was determined how close each state was to a lease tract relative to the proximity of all other states to the same lease tract

TX 160/20 or 8 times closer than the farthest distance,
LA 160/40 or 4 times closer than the farthest distance and twice as far as the closest,
MS 160/80 or 2 times closer than the farthest distance and 4 times as far as the closest,
AL 160/160 or 1 (this is the farthest distance) and 16 times as far as the closest distance

Step 3. Used a simple algebra equation to determine the portion of that lease tracts revenue (Lease_Revenue_View) to apply to each state (Lease_X_Factor view);

8x + 4x + 2x + 1x = $2,000,000
therefore, 15x = $2,000,000
and x = $2,000,000/15 so, x = $133,333.3333...(x factor)

Then this value for x was plugged back into the equation (Allocation_by_Lease view);
So, for TX 8*($133,333.3333) = $1,066,666.6667...,
LA; 4*($133,333.3333) = $533,333.3333...,
MS; 2*($133,333.3333) = $266,666.6667...,
AL; 1*($133,333.3333) = $133,333.3333...

Step 4. The sum of the revenue of all lease tracts for each state was determined once the relative proportions from each lease tract were calculated as in the example above to give a total state revenue value

Step 5. This total state revenue value was then divided by the total overall revenue (Total_Revenue view), calculated by summing up the revenue for every eligible lease tract, to generate the state revenue factor (Allocation by State SQL)

Step 6. The state revenue factor was then multiplied by 40% (0.4) of the total amount of funds being split among the 7 states ($56,874,600.00) to give the state allocation before the 25% cap (Allocation by State SQL)

Note: the legislation states that no one state can receive more than 25% ($14,218,650.00) of this 40% share of the overall appropriation

Step 7. The total amount over this 25% cap was determined for LA ($17,435,443.32) and applied as follows to the other 6 states based on the relative proportions they received from the initial calculations (performed using MSExcel):

For each state not over the cap their state revenue factor was divided by the sum of the revenue factors for each state

Then this quotient was multiplied for each state by the amount LA was over the cap

The product was then added to the state's allocation total

Step 8. It was then determined that TX had gone over the 25% cap ($9,203,254.82), and the above procedures were performed again for the remaining 5 states

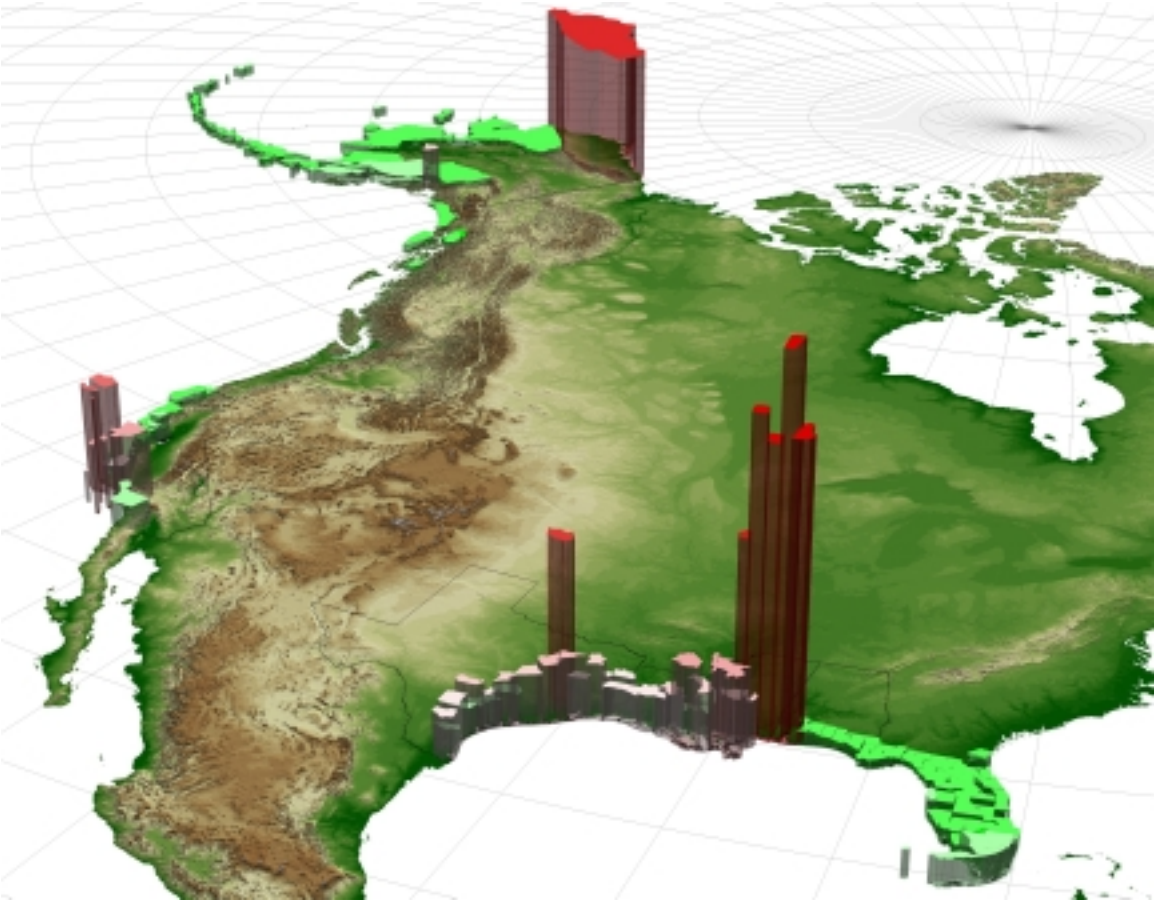
Step 9. The final results can be found in the Final State Allocations.xls file

Step 10. These total state allocation values were then multiplied by 35% (0.35) to give the amounts that were divided among the local political subunits for each state

Saved in Oracle as a table (State_Allocations) containing the state name, state allocation amount, and the local allocation amount

3. Local Allocations

(see Ex. Allocation Formula for County Distance Calculations.xls)



Map showing estimated county allocations (vertical height represents dollars).
Note: vertical scale is not the same as in the state map.

County Distance Factor Calculations

Step 1. Using the cnty_lease_distance table, calculated the sum of all distances from the various counties within a state to those lease tracts used to calculate that states allocation total (Cnty_Total_Distance view)

Step 2. Determined what the maximum total distance was for each state (Max_Total_Distance)

Step 3. Divided the maximum summed distance in the state by each of the summed distances for each county to get a distance factor for each county within the state (Cnty_X_Factor view)

Lease #001
distance to 01001 10 miles,
01003 20 miles,
01005 40 miles,
so for 01001 40/10 = 4,
01003 40/20 = 2,
01005 40/40 = 1

Step 4. Used a simple algebra equation that involved summing up the distance factors for the counties of each state and dividing 1.0 by this distance factor sum to get the Cnty_X_Factor (Cnty_X_Factor view) for each county as follows:

4x + 2x + 1x = 1,
therefore 7x = 1,
or x = 1/7 or 0.14285 ...(x factor)

Step 5. Plugged the Cnty_X_Factor back into the formula to get a Cnty_Lease_Dist_Factor to plug into the overall local allocation calculation (Cnty_Lease_Dist_Factor view) for each county as follows:

for 01001, 4*(0.14285 ...) = 0.57142 ...
for 01003, 2*(0.14285 ...) = 0.28571 ...
for 01005 1*(0.14285 ...) = 0.14285 ...

California Exception:

The legislation states that for any CA county that has a shoreline and contains one or more oil refineries but is greater than 200 miles from the closest least tract, that county should be considered to be located 50 miles from the closest lease tract

It was determined that this might come into play for Contra Costa and/or Solano counties

After the GIS program was run, it was determined that Solano County was 217 miles from the closest least tract, but Contra Costa County was 196 and 197 miles from the closest two least tracts

Therefore, for Solano County (06095) all distances were reduced by 167 miles when calculating the county's lease distance factors (Cnty_Total_Dist view)

County Shoreline Length Factor Calculations

Step 1. Determined the total shoreline length for each state (Total_State_Shorelen_Mi view)

Step 2. Divided the county shoreline length by the state shoreline length to get the county shoreline length factor for each coastal county to plug into the overall local allocation calculation (Cnty_Pop90_Shorlen_Factors view)

County Population Factor Calculations

Step 1. Determined the total coastal population for each state (Total_State_Pop90 view)

Step 2. Divided the county population by the coastal state population to get the county population factor for each coastal county to plug into the overall local allocation calculation (Cnty_Pop90_Shorlen_Factors view)

Overall Local Allocation Calculation

Used 2 views (Cnty_Lease_Dist_Factor, Cnty_Pop90_Shorlen_Factors views) and the State_Allocation table generated previously to plug the main components of the overall local allocation calculation into the formula (County Allocations SQL) as follows:

Local allocation = (0.35 * state allocation) * ((0.25 * cnty_shorlen_factor) + (0.25 * cnty_pop90_factor) + (0.5 * cnty_lease_distance_factor))

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[i] Snyder, John P. 1987. *Map Projections – A Working Manual.* U.S.G.S. Professional Paper 1395. Washington, D.C.: Government Printing Office.

Visual Basic Program for calculating great circle distance, on an ellipsoid:

```
  Private Sub Command1_Click()
  Dim D, D1, X, D1Deg As Double
  Dim r2d, d2r As Double
  Dim long1, lat1, long2, lat2 As Double
  Dim radian_length, rad_length_meter, rad_length_in_miles As Double
  Dim one_radian, SM, sin_square, geo_lat, geo_long As Double
  Dim BaseLine_DB As Recordset
  Dim St_DB As Recordset
  Dim Lease_DB As Recordset
  Dim MyDB As Database
  Dim Lease_No As String
  Dim Lease_X As Double
  Dim Lease_Y As Double
  Dim PrevFips As String
  Dim NextFips As String
  Dim BaseLine_Array(22114) As BaseLinePts  'Must change this value to reflect new array size
  Dim St_Array(5) As St_Lookup   'Must change this value to reflect new array size
  Dim EachPt_txt As New FileSystemObject, EachPt_fil
  Dim i, j As Integer
  Dim St_txt As New FileSystemObject, st_fil
  Dim Base_Seq As Integer

  Set MyDB =
Workspaces(0).OpenDatabase("e:\Coastal_Impact\coastal_imp.MDB")

  Const a = 6378137#     ' GRS80
  Const e_square = 0.00669438      ' GRS80
  Const FipsDistance = 10000

  'converted degrees to radians
  d2r = 3.14159265358979 / 180
  r2d = 1# / d2r
  one_radian = r2d

  '**************************************************
  'The following code basically creates two text files
```

```
'*****************************************************
Set EachPt_txt = CreateObject("Scripting.FileSystemObject")
Set EachPt_fil = EachPt_txt.CreateTextFile("EachPt.txt", True)
Pt_Header_Str = "Lease_Numb,Lease_X,Lease_Y,"
Pt_Header_Str = Pt_Header_Str &
"Base_Seq,Base_X,Base_Y,STFips,STFips_S1,SM"
EachPt_fil.WriteLine (Pt_Header_Str)

Set St_txt = CreateObject("Scripting.FileSystemObject")
Set st_fil = St_txt.CreateTextFile("StMindist.txt", True)
St_Header_Str =
"St_Seq,STFips,Lease_Numb,Lease_X,Lease_Y,Base_X,Base_Y,Base_Seq,Min_Dist"
st_fil.WriteLine (St_Header_Str)

'****************************************************
'The following code basically reads BaseLine Points
'into an array
'****************************************************
Set BaseLine_DB = MyDB.OpenRecordset("Baseline_points")
BaseLine_DB.MoveFirst

For i = 0 To (BaseLine_DB.RecordCount - 1)
  BaseLine_Array(i).Base_Seq = BaseLine_DB!Base_Seq
  BaseLine_Array(i).Base_X = BaseLine_DB!Base_X
  BaseLine_Array(i).Base_Y = BaseLine_DB!Base_Y
  BaseLine_Array(i).Base_STFips = BaseLine_DB!STFips
  BaseLine_Array(i).Base_STFipsS1 = BaseLine_DB!STFips_S1
  BaseLine_DB.MoveNext
Next

TotalBasePtNo = BaseLine_DB.RecordCount - 1

BaseLine_DB.Close

'****************************************************

'****************************************************
'The following code basically reads State Lookup
'into an array
'****************************************************
Set St_DB = MyDB.OpenRecordset("State_Lookup")
St_DB.MoveFirst

For i = 1 To (St_DB.RecordCount)
  St_Array(i).St_Seq = St_DB!St_Seq
  St_Array(i).STFips = St_DB!STFips
  St_Array(i).ST_MinDist = St_DB!Min_Dist
  St_DB.MoveNext
Next
St_DB.Close

'****************************************************
Set Lease_DB = MyDB.OpenRecordset("Lease_Points")
Lease_DB.MoveFirst

For i = 0 To (Lease_DB.RecordCount - 1)  'Just for degugging purpose only, set that to 1 for each lease points

  Lease_No = Lease_DB!Lease_Numb
  Lease_X = Lease_DB!Lease_X
  Lease_Y = Lease_DB!Lease_Y

  'As soon as I read the next lease number reset the minimum distance to
  '10000 again
  Set St_DB = MyDB.OpenRecordset("State_Lookup")
```

```
   St_DB.MoveFirst

   For j = 1 To (St_DB.RecordCount)
     St_Array(j).St_Seq = St_DB!St_Seq
     St_Array(j).STFips = St_DB!STFips
     St_Array(j).ST_MinDist = St_DB!Min_Dist
     St_DB.MoveNext
   Next
   St_DB.Close

   For EachPt = 0 To (UBound(BaseLine_Array) - 1)

     PrevFips = BaseLine_Array(EachPt).Base_STFips  'Reads the First STFips and Store
     NextFips = BaseLine_Array(EachPt + 1).Base_STFips 'Reads the next STFips and Store

     long1 = Lease_X * d2r  'centroid of tract x or longitude (negative number)
     lat1 = Lease_Y * d2r   'Centroid of tract y or latitude

     long2 = BaseLine_Array(EachPt).Base_X * d2r  'baseline x or longitude  (negative number)
     lat2 = BaseLine_Array(EachPt).Base_Y * d2r   'baseline y or latitude

     '*****************************************
     'The following code is to calculate Distance
     '*****************************************
     X = (long1) - (long2)
     D = (Sin(lat1) * Sin(lat2)) + (Cos(lat1) * Cos(lat2) * Cos(X))
     D1 = Atn(-D / Sqr(-D * D + 1)) + 2 * Atn(1)  ' arc cosine function
     D1Deg = (D1 * one_radian)
     geo_lat = (lat1 + lat2) / 2
     geo_long = ((long1) - (long2))
     sin_square = Sin(geo_lat) * Sin(geo_lat)
     radian_length = a * (1 - e_square) / ((1 - e_square * sin_square) ^ (3 / 2))
     rad_length_meter = (radian_length * d2r)
     rad_length_in_miles = (rad_length_meter / 1609.344)
     SM = (D1Deg * rad_length_in_miles)

     '*****************************************************************
     'The Following code writes each distance to the text file
     'I do this just to see whether the calculations are correct or not

'*****************************************************************
     'LinetoWrite = Lease_No & "," & Lease_X & "," & Lease_Y & ","
     'LinetoWrite = LinetoWrite & BaseLine_Array(EachPt).Base_Seq & ","
     'LinetoWrite = LinetoWrite & BaseLine_Array(EachPt).Base_X & ","
     'LinetoWrite = LinetoWrite & BaseLine_Array(EachPt).Base_Y & ","
     'LinetoWrite = LinetoWrite & BaseLine_Array(EachPt).Base_STFips & ","
     'LinetoWrite = LinetoWrite & BaseLine_Array(EachPt).Base_STFipsS1 & ","
     'LinetoWrite = LinetoWrite & SM
     'EachPt_fil.WriteLine (LinetoWrite)

     '*****************************************************************


'*****************************************************************
     'The following code basically writes only the minimum distance
     'to the output file

'*****************************************************************
     StSeq = BaseLine_Array(EachPt).Base_STFipsS1
     If (SM < St_Array(StSeq).ST_MinDist) Then
        St_Array(StSeq).ST_MinDist = SM
        Base_Seq = BaseLine_Array(EachPt).Base_Seq
     End If  'If (SM < St_Array(StSeq).ST_MinDist) Then
```

```
    If (PrevFips <> NextFips) Then


'*********************************************************************
*****
    'The following code basically writes the State info and minimum dist to the
    'output file as soon as State Fips changes
    'First it writes the record out then resets the value of SM for other fips

'*********************************************************************
******
      StLinetoWrite = StSeq & "," & St_Array(StSeq).STFips & ","
      StLinetoWrite = StLinetoWrite & Lease_No & ","
      StLinetoWrite = StLinetoWrite & Lease_X & ","
      StLinetoWrite = StLinetoWrite & Lease_Y & ","
      StLinetoWrite = StLinetoWrite & BaseLine_Array(Base_Seq - 1).Base_X & ","
      StLinetoWrite = StLinetoWrite & BaseLine_Array(Base_Seq - 1).Base_Y & ","
      StLinetoWrite = StLinetoWrite & Base_Seq & ","
      StLinetoWrite = StLinetoWrite & St_Array(StSeq).ST_MinDist
      st_fil.WriteLine (StLinetoWrite)

    End If  'If (PrevFips <> NextFips) Then

    'Write the last record out because PrevFips & NextFips will always be same
    'If (TotalBasePtNo = EachPt) Then
    '  StLinetoWrite = StSeq & "," & St_Array(StSeq).STFips & ","
    '  StLinetoWrite = StLinetoWrite & Lease_No & ","
    '  StLinetoWrite = StLinetoWrite & Lease_X & ","
    '  StLinetoWrite = StLinetoWrite & Lease_Y & ","
    '  StLinetoWrite = StLinetoWrite & BaseLine_Array(Base_Seq - 1).Base_X & ","
    '  StLinetoWrite = StLinetoWrite & BaseLine_Array(Base_Seq - 1).Base_Y & ","
    '  StLinetoWrite = StLinetoWrite & Base_Seq & ","
    '  StLinetoWrite = StLinetoWrite & St_Array(StSeq).ST_MinDist
    '  st_fil.WriteLine (StLinetoWrite)
    'End If
   Next
   Lease_DB.MoveNext
  Next
  Lease_DB.Close
  EachPt_fil.Close
  st_fil.Close
  MsgBox "Done"
End Sub
```


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[ii] State Plane Coordinate System zones used in coastline length calculation, by counties.

ALABAMA WEST ZONE:
BALDWIN, MOBILE

CALIFORNIA ZONE I:
DEL NORTE, HUMBOLDT

CALIFORNIA ZONE II:
MENDOCINO, NAPA, SOLANO, SONOMA

CALIFORNIA ZONE III:
ALAMEDA, CONTRA COSTA, MARIN, SAN FRANCISCO, SAN MATEO, SANTA CLARA, SANTA CRUZ

CALIFORNIA ZONE IV:
MONTEREY

CALIFORNIA ZONE V:
LOS ANGELES, SAN LUIS OBISPO, SANTA BARBARA, VENTURA

CALIFORNIA ZONE VI:
ORANGE, SAN DIEGO

LOUISIANA SOUTH ZONE:
ASSUMPTION, CALCASIEU, CAMERON, IBERIA, JEFFERSON, LAFOURCHE, LIVINGSTON, ORLEANS, PLAQUEMINES, ST. BERNARD, ST. CHARLES, ST. JAMES, ST. JOHN THE BAPTIST, ST. MARTIN, ST. MARY, ST. TAMMANY, TANGIPAHOA, TERREBONNE, VERMILION

MISSISSIPPI EAST ZONE:
HANCOCK, HARRISON, JACKSON

FLORIDA EAST ZONE:
BREVARD, BROWARD, CLAY, COLLIER, DADE, DUVAL, FLAGLER, GLADES, HENDRY, HIGHLANDS, INDIAN RIVER, LAKE, MARTIN, MONROE, NASSAU, OKEECHOBEE, ORANGE, OSCEOLA, PALM BEACH, PUTNAM, SEMINOLE, ST. JOHNS, ST. LUCIE, VOLUSIA

FLORIDA WEST ZONE:
CHARLOTTE, CITRUS, DE SOTO, HARDEE, HERNANDO, HILLSBOROUGH, LEE, LEVY, MANATEE, MARION, PASCO, PINELLAS, POLK, SARASOTA, SUMTER

FLORIDA NORTH ZONE:
ALACHUA, BAKER, BAY, BRADFORD, CALHOUN, COLUMBIA, DIXIE, ESCAMBIA, FRANKLIN, GADSDEN, GILCHRIST, GULF HAMILTON, HOLMES, JACKSON, JEFFERSON, LAFAYETTE, LEON, LIBERTY, MADISON, OKALOOSA, SANTA ROSA, SUWANNEE, TAYLOR, UNION, WAKULLA, WALTON, WASHINGTON

TEXAS CENTRAL ZONE:
ORANGE

TEXAS SOUTH CENTRAL ZONE:
ARANSAS, BRAZORIA, CALHOUN, CHAMBERS, GALVESTON, HARRIS, JACKSON, JEFFERSON, MATAGORDA, REFUGIO, VICTORIA

TEXAS SOUTH ZONE:
CAMERON, KENEDY, KLEBERG, NUECES, SAN PATRICIO, WILLACY

[iii] NADCON, Version 2.10, August 29, 2000, Distribution Copy, PROGRAM DESCRIPTION

NADCON transforms latitude and longitude coordinate values between the North American Datum of 1927 (NAD 27) and the North American Datum of 1983 (NAD 83). NADCON is the Federal standard for NAD 27 to NAD 83 datum transformations (as was articulated in the Federal Register, Volume 55, Number 155 dated August 10, 1990). NADCON also transforms data originally expressed in old island datums that exist in Alaska, Hawaii, Puerto Rico, American Samoa, and Virgin Islands into data referenced to NAD 83. However all datums, including these, are referred to within the program as NAD 27. NADCON automatically chooses the proper transformation; the user does not need to know the specific name of the old island datum.

NADCON conversions between datums are approximate values based on models of real data. NADCON should be used only when data does not exist in the data base (NGSIDB) for one of the datums required. The accuracy of the transformations should be viewed with some caution. At the 67 percent confidence level, this method introduces approximately 0.15 meter uncertainty within the conterminous United States, 0.50 meter uncertainty within Alaska, 0.20 meter uncertainty within Hawaii, and 0.05 meter uncertainty within Puerto Rico and the Virgin Islands. In areas of sparse geodetic data coverage NADCON may yield less accurate results, but seldom in excess of 1.0 meter. Transformations between NAD 83 and States/Regions with High Accuracy Reference Networks (HARNS) introduce approximately 0.05 meter uncertainty. Transformations between old datums (NAD 27, Old Hawaiian, Puerto Rico etc.) and HARN could combine uncertainties (e.g. NAD 27 to HARN equals 0.15 meter + 0.05 meter = 0.20 meter). In near offshore regions, results will be less accurate but seldom in excess of 5.0 meters. Farther offshore NAD 27 was undefined. Therefore, the NADCON computed transformations are extrapolations and no accuracy can be stated.

NADCON cannot improve the accuracy of data. Stations that are originally third-order will not become first-order stations. NADCON is merely a tool for transforming coordinate values between datums. Remember, this program is based exclusively upon data within the official National Spatial Reference System (NSRS). Data originating from stations not part of this official reference may not be compatible. Be sure that the data to be transformed is actually referenced to the NSRS. While NADCON will print out latitudes and longitudes to 0.00001 seconds of arc, the results in the fourth or fifth place may change depending on the platform used. However, all results will be limited to, and within, the accuracy stated above. This is true even though additional precision may be implied by the results....

Comments, questions, and concerns can be addressed to:

Mr. David Doyle or Ms. Cindy Craig
N/GS4 N/NGS21
SSMC3 #8535 SSMC 3, #8708
1315 East-West Highway1315 East-West Highway
Silver Spring, MD20910Silver Spring, MD20910
Telephone: (301) 713-3178 Telephone: (301) 713-3194
email:daved@ngs.noaa.govemail:cindy@ngs.noaa.gov

Additional copies of this program can be obtained from:

National Geodetic Survey
Information Services Branch
SSMC-3, #9202
1315 East-West Highway
Silver Spring, MD 20910
Telephone: (301) 713-3242

World Wide Web Home Page:http://www.ngs.noaa.gov

[iv] Identification_Information:
  Citation:
    Citation_Information:
      Originator: Minerals Management Service, Mapping and Boundary Branch
      Publication_Date: 200001
      Title:
        Digital Offshore Cadastre (DOC) - Gulf of Mexico 27 - Leasing Map /
        Official Protraction Diagram
      Geospatial_Data_Presentation_Form: Map
      Series_Information:
        Series_Name: Digital Offshore Cadastre
        Issue_Identification: current
      Publication_Information:
        Publication_Place: Lakewood, Colorado
        Publisher: Minerals Management Service, Mapping and Boundary Branch
      Online_Linkage: ftp://mmspub.mms.gov/pub/mapping/gom27
      Larger_Work_Citation:
        Citation_Information:
          Originator: Minerals Management Service, Mapping and Boundary Branch
          Publication_Date: 200001
          Title:
            Technical Information Management System (TIMS), Mapping System,
            Block and Boundary Component
          Geospatial_Data_Presentation_Form: Map
          Publication_Information:
            Publication_Place: Lakewood, Colorado
            Publisher: Minerals Management Service, Mapping and Boundary Branch
  Description:
    Abstract:
      Areas of the Outer Continental Shelf (OCS) within Federal
      jurisdiction, and associated data the Minerals Management Service
      (MMS) uses to develop an offshore cadastre (OCS blocks). An official
      baseline is established and used to generate the Submerged Lands Act
      (SLA) boundary and Limit of '8(g) Zone'. The SLA boundaries for Texas,
      Louisiana, Mississippi, and Alabama have been fixed by decree of the

US Supreme Court. The SLA boundary of Florida south of approximately 26 N. has not been officially computed and accepted. An unofficial boundary is shown in this area. Other boundaries and lines (Exclusive Economic Zone (EEZ), international maritime, marine sanctuaries and national park) may also be included where these are appropriate and known. Planning Area boundaries are administrative limits for planning purposes and are subject to change. The US-Mexico Maritime Boundary and the US-Cuba Provisional Maritime Boundary define the southern extent of OCS Planning Areas. The gaps in these maritime boundaries have been closed with a Limit of Protraction and are subject to change.

Purpose:

Official Protraction Diagrams (OPD's) and associated boundaries and areas are generated in accordance with 30 Code of Federal Regulations (CFR) 256.8 to support Federal land ownership and mineral resource management.

Time_Period_of_Content:

Time_Period_Information:

Single_Date/Time:

Calendar_Date: 200001

Currentness_Reference: Publication date

Status:

Progress: Complete

Maintenance_and_Update_Frequency: As needed

Spatial_Domain:

Bounding_Coordinates:

West_Bounding_Coordinate: -98.00

East_Bounding_Coordinate: -81.00

North_Bounding_Coordinate: 30.50

South_Bounding_Coordinate: 24.00

Keywords:

Theme:

Theme_Keyword_Thesaurus: None

Theme_Keyword: Offshore

Theme_Keyword: Cadastre

Theme_Keyword: Planning Area

Theme_Keyword: Leasing Map

Theme_Keyword: Official Protraction Diagram, OPD

Theme_Keyword: Submerged Lands Act boundary

Theme_Keyword: Outer Continental Shelf, OCS

Theme_Keyword: Minerals Management Service, MMS

Theme_Keyword: Oil and gas

Theme_Keyword: Three Mile Line

Place:

Place_Keyword_Thesaurus: None

Place_Keyword: USA

Place_Keyword: Gulf of Mexico

Place_Keyword: Western Gulf of Mexico

Place_Keyword: Central Gulf of Mexico

Place_Keyword: Eastern Gulf of Mexico

Place_Keyword: Exclusive Economic Zone, EEZ

Access_Constraints: None. The Block and Boundary data is in the public domain.

Use_Constraints:

The data was developed within the U.S. Government; no proprietary rights may be attached to them nor may they be sold to the U.S. Government as part of any procurement of ADP products or services.

Point_of_Contact:

Contact_Information:

Contact_Organization_Primary:

Contact_Organization: Minerals Management Service, Mapping & Boundary Branch

Contact_Person: Richard Naito

Contact_Position: Cartographer

Contact_Address:

Address_Type: Mailing address

Address: P.O. Box 25165, Mail Stop 4011

Address: Denver Federal Center
City: Lakewood
State_or_Province: Colorado
Postal_Code: 80225
Country: USA
Contact_Voice_Telephone: (303) 275-7187
Contact_Facsimile_Telephone: (303) 275-7106
Contact_Electronic_Mail_Address: richard.naito@mms.gov
Hours_of_Service: 6:30am-2:30pm MT
Native_Data_Set_Environment:
Coverages were created in Arc/Info version 7.0.4 on a Sun Sparc Station 10 running Solaris 2.5.1
Cross_Reference:
Citation_Information:
Originator: Minerals Management Service, Mapping and Boundary Branch
Publication_Date: 1994-1995
Title: Supplemental Official OCS Block Diagrams (SOBD's)
Edition: current version, same vintage as OPD's
Geospatial_Data_Presentation_Form: Diagram
Publication_Information:
Publication_Place: Lakewood, Colorado
Publisher: Minerals Management Service, Mapping and Boundary Branch
Other_Citation_Details:
SOBD's contain additional coordinate and area calculations for individual blocks.
Online_Linkage:
None. SOBD's are available only in paper form from the MMS Gulf of Mexico regional office.
Larger_Work_Citation:
Citation_Information:
Originator: Minerals Management Service, Mapping and Boundary Branch
Publication_Date: 200001
Title:
Technical Information Management System (TIMS), Mapping System, Block and Boundary Component
Cross_Reference:
Citation_Information:
Originator:
Minerals Management Service, Gulf of Mexico Region, Leasing Division
Publication_Date: Unpublished material
Title: Leases
Publication_Information:
Publication_Place: New Orleans, Louisiana
Publisher:
Minerals Management Service, Gulf of Mexico Region, Leasing Division
Other_Citation_Details:
This Oracle database contains current information on the status of Federal leases.
Larger_Work_Citation:
Citation_Information:
Originator: Minerals Management Service
Publication_Date: 200001
Title:
Technical Information Management System (TIMS), Lease Administration Component
Data_Quality_Information:
Logical_Consistency_Report:
Coordinates for Official Protraction Diagram (OPD), Leasing Maps, OCS blocks, baseline, and projected boundaries are calculated quantities and have been defined to be correct to 3 decimal places of a foot. Coverages have been topologically cleaned with Arc/Info's 'CLEAN' command using dangle length = 0 and fuzzy tolerance = 0.000002.

```
  Completeness_Report:
    All NAD27 Gulf of Mexico offshore protraction diagram (OPD) and
    Leasing Map boundaries are shown.  The status of leasing and blocks
    under non-Federal jurisdiction are not shown.
  Positional_Accuracy:
    Horizontal_Positional_Accuracy:
      Horizontal_Positional_Accuracy_Report:
        Coordinates for points forming the Submerged Lands Act (SLA) boundary
        line are calculated values to 3 decimal places of a foot.  Official
        protraction diagram (OPD) and Leasing Map corners are calculated
        values to 3 decimal places of a foot.
  Lineage:
    Source_Information:
      Source_Citation:
        Citation_Information:
          Originator: Minerals Management Service, Mapping and Boundary Branch
          Publication_Date: 200001
          Title: TIMS, Mapping Syetem, Block and Boundary Component
          Geospatial_Data_Presentation_Form: Map
          Publication_Information:
            Publication_Place: Lakewood, Colorado
            Publisher: Minerals Management Service, Mapping and Boundary Branch
      Type_of_Source_Media: Computer program
      Source_Time_Period_of_Content:
        Time_Period_Information:
          Single_Date/Time:
            Calendar_Date: 20000210
        Source_Currentness_Reference: Publication date
      Source_Citation_Abbreviation: MMS, TIMS
      Source_Contribution: Source coordinates were taken from TIMS.
    Process_Step:
      Process_Description:
        The source data for the Leasing Maps and Official Protraction Diagrams
        (OPD) are a theoretical mathematical derivation.  The source data for
        the Submerged Lands Act (SLA) boundary line are baseline points in the
        TIMS Block and Boundary database.  In-house computer programs are used
        to generate points to form the (SLA) line at the appropriate distance
        from the baseline points.
      Source_Used_Citation_Abbreviation: MMS, TIMS
      Process_Date: 20000210
      Process_Contact:
        Contact_Information:
          Contact_Organization_Primary:
            Contact_Organization:
              Minerals Management Service, Mapping and
              Boundary Branch
            Contact_Person: Leland Thormahlen
          Contact_Position: Branch chief
          Contact_Address:
            Address_Type: Mailing address
            Address: P.O. Box 25165, Mail Stop 4011
            Address: Denver Federal Center
            City: Lakewood
            State_or_Province: Colorado
            Postal_Code: 80225
            Country: USA
          Contact_Voice_Telephone: (303) 275-7121
          Contact_Facsimile_Telephone: (303) 275-7106
          Contact_Electronic_Mail_Address: leland.thormahlen@mms.gov
          Hours_of_Service: 7:00am-3:30pm MT
Spatial_Data_Organization_Information:
  Indirect_Spatial_Reference: U.S. Gulf of Mexico Outer Continental Shelf (OCS)
  Direct_Spatial_Reference_Method: Vector
Spatial_Reference_Information:
```

```
  Horizontal_Coordinate_System_Definition:
    Geographic:
      Latitude_Resolution: 0.00000001
      Longitude_Resolution: 0.00000001
      Geographic_Coordinate_Units: Decimal degrees
    Geodetic_Model:
      Horizontal_Datum_Name: North American Datum 1927
      Ellipsoid_Name: Clarke Spheroid of 1866
      Semi-major_Axis: 6378206.4 m
      Denominator_of_Flattening_Ratio: 294.98
Entity_and_Attribute_Information:
  Overview_Description:
    Entity_and_Attribute_Overview:
      Leasing Map, Official Protraction Diagram
      and OCS Submerged Lands Act boundary
    Entity_and_Attribute_Detail_Citation:
      The coverages contain only the default attributes created by the
      Arc/Info generate, clean and build processes.
Distribution_Information:
  Distributor:
    Contact_Information:
      Contact_Organization_Primary:
        Contact_Organization:
          Minerals Management Service, Mapping and
          Boundary Branch
      Contact_Address:
        Address_Type: Mailing address
        Address: P.O. Box 25165, Mail Stop 4011
        Address: Denver Federal Center
        City: Lakewood
        State_or_Province: Colorado
        Postal_Code: 80225
        Country: USA
      Contact_Voice_Telephone: (303) 275-7121
      Contact_Facsimile_Telephone: (303) 275-7106
      Hours_of_Service: 7:00am-3:30pm MT
  Resource_Description: Digital Offshore Cadastre
  Distribution_Liability: As is.  No responsibility is assumed for the correctness of this data.
  Standard_Order_Process:
    Digital_Form:
      Digital_Transfer_Information:
        Format_Name: ARCE and Arc/View Shape Files
        Format_Version_Number: 7.0.4
        Transfer_Size: 1.6 Mbytes
      Digital_Transfer_Option:
        Online_Option:
          Computer_Contact_Information:
            Network_Address:
              Network_Resource_Name: ftp://mmspub.mms.gov/pub/mapping/
          Access_Instructions:
            Files are available via anonymous ftp from mmspub.mms.gov in the
            pub/mapping/gom27 subdirectory.  For Arc/Info export files
            download the gm27pa.tar.Z file, 1.6Mbytes, in binary mode.  In A
            UNIX environment use 'uncompress gm27pa.tar.Z' and then 'tar xvf
            gm27pa.tar'.  The resulting four files will be a metadata file,
            mdgm27pa.txt (this file) and one Arc/Info export data file for
            each GOM planning area (Western, Cental and Eastern).
            For Arc/View shape files download the gm27pa.zip file, 1.2Mbytes,
            in binary mode.  Unzipping this file will give a metadata file,
            mdgm27pa.txt (this file) and five Arc/View files for each GOM
            planning Area (Western, Central & Eastern).
          Online_Computer_and_Operating_System: Dell Pentium server running Windows NT 4.0
    Fees: None
Metadata_Reference_Information:
```

Metadata_Date: 20000215
Metadata_Review_Date: 20000215
Metadata_Contact:
  Contact_Information:
    Contact_Organization_Primary:
      Contact_Organization:
        Minerals Management Service, Mapping and
        Boundary Branch
      Contact_Person: Richard Naito
    Contact_Position: Cartographer
    Contact_Address:
      Address_Type: Mailing address
      Address: P.O. Box 25165, Mail Stop 4011
      Address: Denver Federal Center
      City: Lakewood
      State_or_Province: Colorado
      Postal_Code: 80225
      Country: USA
    Contact_Voice_Telephone: (303) 275-7187
    Contact_Facsimile_Telephone: (303) 275-7106
    Contact_Electronic_Mail_Address: richard.naito@mms.gov
    Hours_of_Service: 6:30am - 2:30pm MT
Metadata_Standard_Name: Content Standard for Digital Geospatial Metadata
Metadata_Standard_Version: FGDC-STD-001-1998
Metadata_Time_Convention: Local time

[v] Thormahlen, Leland. 1999. "Boundary Development on the Outer Continental Shelf." OCS Report MMS 99-0006. Lakewood, CO: U.S. Department of the Interior, Minerals Management Service, Mapping and Boundary Branch.

[vi] Identification_Information:
Citation:
  Citation_Information:
    Originator:
      U.S. Department of Commerce
      Bureau of the Census
      Geography Division
    Publication_Date: 2001
    Title: TIGER/Line Files, Redistricting Census 2000
    Edition: Redistricting Census 2000
    Series_Information:
      Series_Name: TIGER/Line Files
      Issue_Identification: Version (MMYY) represents the month and year file created
    Publication_Information:
      Publication_Place: Washington, DC
      Publisher:
        U.S. Department of Commerce
        Bureau of the Census
        Geography Division
Description:
  Abstract:
    TIGER, TIGER/Line, and Census TIGER are registered trademarks of the Bureau of the Census. The Redistricting Census 2000 TIGER/Line files are an extract of selected geographic and cartographic information from the Census TIGER data base. The geographic coverage for a single TIGER/Line file is a county or statistical equivalent entity, with the coverage area based on January 1, 2000 legal boundaries. A complete set of Redistricting Census 2000 TIGER/Line files includes all counties and statistically equivalent entities in the United States and Puerto Rico. The Redistricting Census 2000 TIGER/Line files will not include files for the Island Areas. The Census TIGER data base represents a seamless national file with no overlaps or gaps between parts. However, each county-based TIGER/Line file is designed to stand alone as an independent data set or the files can be combined to cover the whole Nation. The Redistricting Census 2000 TIGER/Line files consist of line segments representing physical features and governmental and statistical boundaries. The Redistricting Census

2000 TIGER/Line files do NOT contain the ZIP Code Tabulation Areas (ZCTAs) and the address ranges are of approximately the same vintage as those appearing in the 1999 TIGER/Line files. That is, the Census Bureau is producing the Redistricting Census 2000 TIGER/Line files in advance of the computer processing that will ensure that the address ranges in the TIGER/Line files agree with the final Master Address File (MAF) used for tabulating Census 2000. The files contain information distributed over a series of record types for the spatial objects of a county. There are 17 record types, including the basic data record, the shape coordinate points, and geographic codes that can be used with appropriate software to prepare maps. Other geographic information contained in the files includes attributes such as feature identifiers/census feature class codes (CFCC) used to differentiate feature types, address ranges and ZIP Codes, codes for legal and statistical entities, latitude/longitude coordinates of linear and point features, landmark point features, area landmarks, key geographic features, and area boundaries. The Redistricting Census 2000 TIGER/Line data dictionary contains a complete list of all the fields in the 17 record types.

Purpose:

In order for others to use the information in the Census TIGER data base in a geographic information system (GIS) or for other geographic applications, the Census Bureau releases to the public extracts of the data base in the form of TIGER/Line files. Various versions of the TIGER/Line files have been released; previous versions include the 1990 Census TIGER/Line files, the 1992 TIGER/Line files, the 1994 TIGER/Line files, the 1995 TIGER/Line files, the 1997 TIGER/Line files, the 1998 TIGER/Line files, and the 1999 TIGER/Line files. The Redistricting Census 2000 TIGER/Line files were originally produced to support the Census 2000 Redistricting Data Program.

Supplemental_Information:

To find out more about TIGER/Line files and other Census TIGER data base derived data sets visit http://www.census.gov/geo/www/tiger.

Time_Period_of_Content:

Time_Period_Information:

Single_Date/Time:

Calendar_Date: 2000

Currentness_Reference: 2000

Status:

Progress: Complete

Maintenance_and_Update_Frequency:

TIGER/Line files are extracted from the Census TIGER data base when needed for geographic programs required to support the census and survey programs of the Census Bureau. No changes or updates will be made to the Redistricting Census 2000 TIGER/Line files. Future releases of TIGER/Line files will reflect updates made to the Census TIGER data base and will be released under a version numbering system based on the month and year the data is extracted.

Spatial_Domain:

Bounding_Coordinates:

West_Bounding_Coordinate: +131.000000

East_Bounding_Coordinate: -64.000000

North_Bounding_Coordinate: +72.000000

South_Bounding_Coordinate: -15.000000

Keywords:

Theme:

Theme_Keyword_Thesaurus: None

Theme_Keyword: Line Feature

Theme_Keyword: Feature Identifier

Theme_Keyword: Census Feature Class Code (CFCC)

Theme_Keyword: Address Range

Theme_Keyword: Geographic Entity

Theme_Keyword: Point/Node

Theme_Keyword: Landmark Feature

Theme_Keyword: Political Boundary

Theme_Keyword: Statistical Boundary

Theme_Keyword: Polygon

Theme_Keyword: County/County Equivalent

Theme_Keyword: TIGER/Line

Theme_Keyword: Topology
Theme_Keyword: Street Centerline
Theme_Keyword: Latitude/Longitude

Theme_Keyword: ZIP Code
Theme_Keyword: Vector
Theme_Keyword: TIGER/Line Identification Number (TLID)
Theme_Keyword: Street Segment
Theme_Keyword: Coordinate
Theme_Keyword: Boundary
Place:
Place_Keyword_Thesaurus:
FIPS Publication 6-4
FIPS Publication 55
Place_Keyword: United States
Place_Keyword: Puerto Rico
Place_Keyword: County
Access_Constraints: None
Use_Constraints:
None. Acknowledgment of the U.S. Bureau of the Census would be appreciated for products derived from these files. TIGER, TIGER/Line, and Census TIGER are registered trademarks of the Bureau of the Census.
Native_Data_Set_Environment:
TIGER/Line files are created and processed in a VMS environment. The environment consists of two Alpha Server 8400s clustered together running OpenVMS version 6.2-1H3 used for production operations. The Census TIGER system is driven by DEC Command language (DCL) procedures which invoke C software routines to extract selected geographic and cartographic information (TIGER/Line files) from the operational Census TIGER data base.
Data_Quality_Information:
Attribute_Accuracy:
Attribute_Accuracy_Report:
Accurate against Federal information Processing Standards (FIPS), FIPS Publication 6-4, and FIPS-55 at the 100% level for the codes and base names. The remaining attribute information has been examined but has not been fully tested for accuracy.
Logical_Consistency_Report:
The feature network of lines (as represented by Record Types 1 and 2) is compete for census purposes. Spatial objects in TIGER/Line belong to the "Geometry and Topology" (GT) class of objects in the "Spatial Data Transfer Standard" (SDTS) FIPS Publication 173 and are topologically valid. Node/geometry and topology (GT)-polygon/chain relationships are collected or generated to satisfy topological edit requirements. These requirements include:
* Complete chains must begin and end at nodes.
* Complete chains must connect to each other at nodes.
* Complete chains do not extend through nodes.
* Left and right GT-polygons are defined for each complete chain element and are consistent throughout the extract process.
* the chains representing the limits of the files are free of gaps.
The Census Bureau performed automated tests to ensure logical consistency and limits of files. All polygons are tested for closure. The Census Bureau uses its internally developed Geographic Update System to enhance and modify spatial and attribute data in the Census TIGER data base. Standard geographic codes, such as FIPS codes for states, counties, municipalities, and places, are used when encoding spatial entities. The Census Bureau performed spatial data tests for logical consistency of the codes during the compilation of the original Census TIGER data base files. Most of the Codes themselves were provided to the Census Bureau by the USGS, the agency responsible for maintaining FIPS 55. Feature attribute information has been examined but has not been fully tested for consistency.
Completeness_Report:
Data completeness of the TIGER/Line files reflects the contents of the Census TIGER data base at the time the TIGER/Line files (Redistricting Census 2000 version) were created.
Positional_Accuracy:

Horizontal_Positional_Accuracy:
Horizontal_Positional_Accuracy_Report:
The information present in these files is provided for the purposes of statistical analysis and census operations only. Coordinates in the TIGER/Line files have six implied decimal places, but the positional accuracy of these coordinates is not as great as the six decimal places suggest. The positional accuracy varies with the source materials used, but generally the information is no better than the established national map Accuracy standards for 1:100,000-scale maps from the U.S. Geological Survey (USGS); thus it is NOT suitable for high-precision measurement applications such as engineering problems, property transfers, or other uses that might require highly accurate measurements of the earth's surface. The USGS 1:100,000-scale maps met national map accuracy standards and use coordinates defined by the North American Datum, 1983. For the contiguous 48 States, the cartographic fidelity of most of the Redistricting Census 2000 TIGER/Line files, in areas outside the 1980 census Geographic Base File/Dual Independent map Encoding (GBF/DIME) file coverage and selected other large metropolitan areas, compare favorable with the USGS 1:100,000-scale maps. The Census Bureau cannot specify the accuracy of features inside of what was the 1980 GBF/DIME-File coverage or selected metropolitan areas. The Census Bureau added updates to the TIGER/Line files that enumerators annotated on maps sheets prepared from the Census TIGER data base as they attempted to traverse every street feature shown on the Census 2000 map sheets; the Census Bureau also made other corrections from updated map sheets supplied by local participants for Census Bureau programs. The locational accuracy of these updates is of unknown quality. In addition to the Federal, State, and local sources, portions of the files may contain information obtained in part from maps and other materials prepared by private companies. Despite the fact the TIGER/Line data positional accuracy is not as high as the coordinate values imply, the six-decimal place precision is useful when producing maps. The precision allows features that are next to each other on the ground to be placed in the correct position, on the map, relative to each other, without overlap.
Lineage:
Source_Information:
Source_Citation:
Citation_Information:
Originator:
U.S. Department of Commerce
Bureau of the Census
Geography Division
Publication_Date: Unpublished material
Title: Census TIGER data base
Edition: Redistricting Census 2000
Type_of_Source_Media: On line
Source_Time_Period_of_Content:
Time_Period_Information:
Single_Date/Time:
Calendar_Date: 2000
Source_Currentness_Reference: Date the file was made available to create TIGER/Line File extracts.
Source_Citation_Abbreviation: TIGER
Source_Contribution:
Selected geographic and cartographic information (line segments) from the Census TIGER data base.
Process_Step:
Process_Description:
In order for others to use the information in the Census TIGER data base in a GIS or for other geographic applications, the Census Bureau releases periodic extracts of selected information from the Census TIGER data base, organized as topologically consistent networks. Software (TIGER DB routines) written by the Geography Division allows for efficient access to Census TIGER system data. TIGER/Line files are extracted from the Census TIGER data base by county or statistical equivalent area. Census TIGER data for a given county or statistical equivalent area is then distributed among 17 fixed length record ASCII files, each one containing attributes for either line, polygon, or landmark geographic data types. The Census Bureau has released various versions of the TIGER/Line files since 1988, with each version having more updates (feature and feature names,

address ranges and ZIP Codes, coordinate updates, revised field definitions, etc.)
than the previous version.
Source_Used_Citation_Abbreviation: Census TIGER data base
Process_Date: 2000
Spatial_Data_Organization_Information:
Indirect_Spatial_Reference:
Federal Information Processing Standards (FIPS) and feature names
and addresses.
Direct_Spatial_Reference_Method: Vector
Point_and_Vector_Object_Information:
SDTS_Terms_Description:
SDTS_Point_and_Vector_Object_Type: Node, network
Point_and_Vector_Object_Count: 570 to 56,000
SDTS_Point_and_Vector_Object_Type: Entity point
SDTS_Point_and_Vector_Object_Type: Complete chain
Point_and_Vector_Object_Count: 790 to 83,000
SDTS_Point_and_Vector_Object_Type: GT-polygon composed of chains
Point_and_Vector_Object_Count: 290 to 33,000
Spatial_Reference_Information:
Horizontal_Coordinate_System_Definition:
Geographic:
Latitude_Resolution: 0.000458
Longitude_Resolution: 0.000458
Geographic_Coordinate_Units: Decimal degrees
Entity_and_Attribute_Information:
Overview_Description:
Entity_and_Attribute_Overview:
The TIGER/Line files contain data describing three major
types of features/entities;
Line Features -
1) Roads
2) Railroads
3) Hydrography
4) Miscellaneous transportation features and selected power lines and pipe lines
5) Political and statistical boundaries
Landmark Features -
1) Point landmarks, e.g., schools and churches.
2) Area landmarks, e.g., Parks and cemeteries.
3) Key geographic locations (KGLs), e.g., shopping centers and factories.
Polygon features -
1) Geographic entity codes for areas used to tabulate the Census 2000 census
statistical data and 1990 geographic areas
2) Locations of area landmarks
3) Locations of KGLs
The line features and polygon information form the majority of data in the TIGER/Line
files. Some of the data/attributes describing the lines include coordinates, feature
identifiers (names), CFCCs (used to identify the most noticeable characteristic of a
feature), address ranges, and geographic entity codes. The TIGER/Line files contain
point and area labels that describe landmark features and provide locational reference.
Area landmarks consist of a feature name or label and feature type assigned to a polygon
or group of polygons. Landmarks may overlap or refer to the same set of polygons.
The Census TIGER data base uses collections of spatial objects (points, lines, and
polygons) to model or describe real-world geography. The Census Bureau uses these
spatial objects to represent features such as streets, rivers, and political boundaries
and assigns attributes to these features to identify and describe specific features
such as the 500 block of Market Street in Philadelphia, Pennsylvania.
Entity_and_Attribute_Detail_Citation:
U.S. Bureau of the Census, TIGER/Line files,
Redistricting Census 2000 Technical Documentation. The TIGER/Line documentation
defines the terms and definitions used within the files.
Distribution_Information:
Distributor:
Contact_Information:
Contact_Organization_Primary:

Contact_Organization:
U.S. Department of Commerce
Bureau of the Census
Geography Division
Products and Services Staff
Contact_Address:
Address_Type: Physical address
Address: 8903 Presidential Parkway, WP I
City: Upper Marlboro
State_or_Province: Maryland
Postal_Code: 20772
Contact_Voice_Telephone: (301) 457-1128
Contact_Address:
Address_Type: Mailing address
Address: Bureau of the Census
City: Washington
State_or_Province: District of Columbia
Postal_Code: 20233-7400
Contact_Voice_Telephone: (301) 457-1128
Contact_Facsimile_Telephone:
(301) 457-4710
Contact_Electronic _Mail_Address: tiger@census.gov
Resource_Description: Redistricting Census 2000 TIGER/Line Files
Distribution_Liability:
No warranty, expressed or implied is made and no liability is assumed by the U.S. Government in general or the U.S. Census Bureau in specific as to the positional or attribute accuracy of the data. The act of distribution shall not constitute any such warranty and no responsibility is assumed by the U.S. Government in the use of these files.
Standard_Order_Process:
Digital_Form:
Digital_Transfer_Information:
Format_Name: TGRLN (compressed)
Format_Version_Number: Redistricting Census 2000
Format_Version_Date: 2000
File_Decompression_Technique: PK-ZIP, version 1.93A or higher
Digital_Transfer_Option:
Online_Option:
Computer_Contact_Information:
Network_Address:
Network_Resource_Name: www.census.gov/geo/www/tiger
Fees:
The online copy of the TIGER/Line files may be accessed without charge. See http://www.census.gov/geo/www/tiger for information on availability on CD-ROM/DVD and associated costs for these products.
Ordering_Instructions:
To obtain more information about ordering TIGER/Line files visit http://www.census.gov/geo/www/tiger.
Technical_Prequisites: The Redistricting Census 2000 TIGER/Line files contain geographic data only and do not include display or mapping software or statistical data. A list of vendors who have developed software capable of processing TIGER/Line files can be found by visiting http://www.census.gov/geo/www/tiger
Metadata_Reference_Information:
Metadata_Date: 2000
Metadata_Contact:
Contact_Information:
Contact_Organization_Primary:
Contact_Organization:
U.S. Department of Commerce
Bureau of the Census
Geography Division
Products and Services Staff
Contact_Address:
Address_Type: Physical Address

Address: 8903 Presidential Parkway, WP I
City: Upper Marlboro
State_or_Province: Maryland
Postal_Code: 20772
Contact_Voice_Telephone: (301) 457-1128
Contact_Electronic_Mail_Address: tiger@census.gov
Metadata_Standard_Name: FGDC Content Standards for Digital Geospatial Metadata
Metadata_Standard_Version: 19940608

[vii] The digital geography is in geographic coordinates, datum = NAD83, spheroid = GRS1980.
Extent of the Medium Resolution Digital Vector Shoreline Digital Geography Geography provides digital data of the shoreline within the contiguous US. The unprojected (geographic coordinates) Medium Resolution Digital Vector Shoreline Digital Geography for the coterminous United States.

Arc attributes found in the Medium Resolution Digital Vector Shoreline Digital Geography

S_SCALE
Map scale of the source chart from which the arcs were captured. From 1:10,000 to 1:600,000.

S_CHART
NOS chart catalog number for chart from which the arcs were captured. Charts included 11301 through 18800.

S_DATUM
Source chart horizontal reference datum.
02
Horizontal Datum = NOS 1902.
27
Horizontal Datum = NOS 1927.
83
Horizontal Datum = NOS 1983.

S_REV_DATE
Source chart's date of revision. Any valid date string (mm/yy), 1/87 through 12/92.

S_SOURCE
Identifies method used to capture source data;
1
Arc/Info-ArcEdit Heads Up.
2
Hitachi CADCore Heads Up.
3
Digitizing Table.
4
Estimation or truncation arc added post capture. (*)
5
Data obtained from the State of Florida.

S_ARC_CODE
Coding identifying the arc type;
1
Shoreline data arc from capture process.
3
Shoreline truncation arc -post capture addition.
5
Shoreline estimation arc -post capture modification/addition. (*)

S_INTEGRIT
Qualitative assessment of arcs accuracy based on source media;
1
Master compilation -heavy gauge mylar (0.007 in).
2
X-drawing; reproduction of master on lighter grade(0.003) mylar.
3
Water resistant paper.
4
Data sourced from the State of Florida.
5
Estimate or truncation arc.(*)
6

Unknown. (*)

REGIONLIST

List of Coastal Assessment Regions (individual or combined list from the following);

N

Polygons of the North Atlantic region.

M

Polygons of the Middle Atlantic region.

S

Polygons of the South Atlantic region.

G

Polygons of the Gulf of Mexico region.

P

Polygons of the Pacific region.

L

Polygons of the Great Lakes region.

U

Polygons within the US border, but not a part of the CAF.

X

Polygons outside US boundaries.

NOTE:

*Truncation arcs are arcs inserted into the data to provide continuity/closure in places where the cartographic information on the chart was incomplete. Often, small water bodies (rivers, streams, and creeks), in locations beyond the point of navigability are terminated to facilitate the insertion of non-cartographic information such as title blocks and notations. Continuity of the data, a requirement our data set specification, is interrupted at these locations if they are captured and retained as depicted on the navigation chart. To reestablish the necessary topological continuity an artificial closure arc is placed across the truncated section of shoreline. These arcs make no attempt to simulate the position of the missing shoreline section(s), but rather simply terminate the feature. To easily identify these arc features in the data field they are given the attribute codes: S_SOURCE = 4 and S_ARC_CODE = 3.

Estimation arcs are used for two purposes: first, to fill in gaps in the shoreline as depicted on the chart (other than those areas which would be considered truncations), and secondly, to identify captured (digitized) shoreline arcs which have been modified in some way either for error rectification or edge matching adjustments. The span of these arcs range from five meters to several tens of meters in length. In the first case, estimator arcs attempt to simulate or mimic the actual shape or course of the coastline in the missing area. Insertion of these arcs into the data is done using heads up methods with the appropriate navigational chart(s) as a guide. In the second case, an existing arcs terminal to node is moved from its original captured location to a position where it can be connected to the concomitant arc's node from an adjacent chart. Additional vertices may then be added to replicate the course of the original information. Modification of existing arcs was carried out such that disruption of the information was minimized. Estimate arcs are identified in the data by the codes: S_SOURCE = 4, S_ARC_CODE = 5.

If the accuracy of the data could not be assessed and thus categorized into one of the five qualitative integrity classes, the arc was classified with an integrity of unknown. Most of the arcs grouped into the unknown category were those captured early in the project. During that time source materials (primarily master compilations and X-drawings) were assumed to be of equal stability and accuracy. This was not, however, the case. Once this disparity was recognized, source tracking procedures were implemented and the integrity of the captured information, based on the stability and clarity of the source media was tracked and assessed.

[viii] Alaska Coastline 1 to 63,360

Metadata also available as - [Questions & Answers] - [Parseable text] - [SGML] - [XML]

Metadata:

Identification_Information
Data_Quality_Information
Spatial_Data_Organization_Information
Spatial_Reference_Information
Entity_and_Attribute_Information
Distribution_Information
Metadata_Reference_Information

Identification_Information:

Citation:

Citation_Information:

Originator:
AK Department of Natural Resources, Land Records Information Section
Publication_Date: 19980211
Title: Alaska Coastline 1 to 63,360
Edition: 1.0
Geospatial_Data_Presentation_Form: vector digital data
Series_Information:
Series_Name: PHYSICAL
Issue_Identification: coast63
Publication_Information:
Publication_Place: Anchorage, AK
Publisher: ADNR, LRIS
Online_Linkage: <URL:http://www.asgdc.state.ak.us/homehtml/pubaccess.html>

Description:
Abstract:
This is a first cut at a statewide 1:63,360 coastline. The entire coasline, however, is not 1:63.360; only where data was available as of January 1998. It is a mixture of sources ranging from the Department of Natural Resources, Land Records Information Section hydrography database to the Exxon Valdez Oil Spill Environmentally Sensitive Index coastline (no ESI attributes included) to the US Geologic Survey hydrography to US Forest Service (in Prince William Sound). Where the 1:63,360 data was unavailable the 1:250,000 coastline was used to fill in.

This information does not include lakes or streams. All streams are cut off at the mouth with a straight line.

Purpose:
The purpose of this information is to provide a better coastline for land data to be clipped. It's purpose is cartographic. Before this was created, land data was clipped to a 1:250,000 statewide coastline which did not include many of the islands and did not match well with the 1:63,360 hydrography. Attributes have been added to the arcs, but have not been checked carefully.

This coverage is the first of its kind at this scale; thus there are errors. Please notify DNR, LRIS so these may be corrected.

Note: The USGS is in the process of automating the hydrography statewide at 1:63,360 and should be used as a replacement when the information is ready. This hydrography was not complete and available as of January 1998, and no specific date was set.

Time_Period_of_Content:
Time_Period_Information:
Single_Date/Time:
Calendar_Date: 1997

Currentness_Reference: publication date

Status:
Progress: In work
Maintenance_and_Update_Frequency: As needed

Spatial_Domain:
Bounding_Coordinates:
West_Bounding_Coordinate: 157.55125214
East_Bounding_Coordinate: -117.38252248
North_Bounding_Coordinate: 67.56587136
South_Bounding_Coordinate: 49.12879913

Keywords:
Theme:
Theme_Keyword_Thesaurus: none
Theme_Keyword: coastline
Theme_Keyword: coast
Theme_Keyword: shore
Theme_Keyword: shoreline
Theme_Keyword: hydrography
Place:

Place_Keyword_Thesaurus: none
Place_Keyword: alaska

Access_Constraints:
To ensure distribution of the most current public information, please refer requests for data or products to the Alaska Department of Natural Resources, Land Records Information Section.

Use_Constraints:
It is not recommended the data be used at a scale larger than 1:63,360.

Any hardcopies or published datasets utilizing these data sets shall clearly indicate their source. If the user has modified the data in any way they are obligated to describe the types of modifications they have performed. User specifically agrees not to misrepresent these data sets, nor to imply that changes they made were approved by the Alaska Department of Natural
Resources.

Point_of_Contact:
Contact_Information:
Contact_Person_Primary:
Contact_Person: GIS Public Access Coordinator
Contact_Organization:
AK Department of Natural Resources - Land Records Information Section
Contact_Position: GIS Public Access Coordinator
Contact_Address:
Address_Type: mailing and physical address
Address: 550 W. 7th Suite 706
City: Anchorage
State_or_Province: AK
Postal_Code: 99501
Country: USA
Contact_Voice_Telephone: 907/269-8833
Contact_Facsimile_Telephone: 907/269-8920
Contact_Electronic_Mail_Address: GIS_Public_Access@dnr.state.ak.us
Hours_of_Service: 800-1600 AST
Contact_Instructions: See Distribution_Information

Data_Set_Credit:
Alaska Department of Natural Resource, Land Records Information Section US Geologic Survey US Forest Service, Chugach US Forest Service, Tongass EVOS Trustee Council

Native_Data_Set_Environment:
SunOS, 5.5.1, sun4m UNIX ARC/INFO version 7.1.1

Data_Quality_Information:
Attribute_Accuracy:
Attribute_Accuracy_Report:
null (used to close mouth of rivers), and the Canadian border. Since a mix of sources were used, this was not always calculated. No QC was done to check accuracy. Will be corrected as
problems arrise or more time is allowed.

Logical_Consistency_Report: Polygon and chain-node topology present.

Completeness_Report:
DNR, LRIS - reselected the hydrography features coded WATER-TYPE = 'S' or 'N' Did some clean up. EVOS - selected and added as need to fill in. USGS - downloaded ITM quads, where needed to fill in. Selected coastline arcs and closing arcs. USFS, Chugach - selected Prince William Sound coastline and filled in. USFS, Tongass - was included into DNR, LRIS hydrography
database.

There are attribute errors. Polygons all closed.

Positional_Accuracy:
Horizontal_Positional_Accuracy:

Horizontal_Positional_Accuracy_Report:
Information was cleanup on the screen. Polygons were closed, dangles deleted, and information edgematched.

Lineage:
Source_Information:
Source_Citation:
Citation_Information:
Originator:
Alaska Department of Natural Resources, Land Records Information Section
Publication_Date: 1990
Title: ITM hydrography
Series_Information:
Series_Name: ITM hydrography data
Issue_Identification: hydro
Publication_Information:
Publication_Place: Anchorage, AK
Publisher: ADNR, LRIS
Source_Scale_Denominator: 63360
Type_of_Source_Media: online
Source_Time_Period_of_Content:
Time_Period_Information:
Range_of_Dates/Times:
Beginning_Date: 1950
Ending_Date: 1997
Source_Currentness_Reference: ground condition
Source_Citation_Abbreviation: none
Source_Contribution:
Source used USGS 1:63,360 topographic maps ranging in date from 1950's to 1990's. These were photo revised by BLM. Only hydrography meeting the needs of the State Status Plats were automated. Arc features were coded with source and water type. US Forest Service, Tongass hydrography data was integrated into datbase to fit DNR's model.
Source_Information:
Source_Citation:
Citation_Information:
Originator: USGS
Publication_Date: 1950-1990
Title: ITM hydrography
Series_Information:
Series_Name: DLG
Issue_Identification: hydrography
Publication_Information:
Publication_Place: Reston, Virginia
Publisher: USGS
Source_Scale_Denominator: 63360
Type_of_Source_Media: web
Source_Time_Period_of_Content:
Time_Period_Information:
Range_of_Dates/Times:
Beginning_Date: 1950
Ending_Date: 1997
Source_Currentness_Reference: ground condition
Source_Citation_Abbreviation: none
Source_Contribution:
Selected coastline information where needed and where available.
Source_Information:
Source_Citation:
Citation_Information:
Originator: USFS, Chugach
Publication_Date: 1996
Title: Chugach National Forest coastline
Publication_Information:
Publication_Place: Anchorage, AK
Publisher: USFS
Source_Scale_Denominator: 63360

Type_of_Source_Media: magnetic tape
Source_Time_Period_of_Content:
Time_Period_Information:
Single_Date/Time:
Calendar_Date: 1950
Source_Currentness_Reference: ground condition
Source_Citation_Abbreviation: none
Source_Contribution:
Chugach National Forest has had significant changes in their shoreline, particularly near Columbia Glacier and Copper River Delta. They have generated a new coastline to reflect these changes. This information was selected and added as the best source for Prince William Sound.
Source_Information:
Source_Citation:
Citation_Information:
Originator: EVOS Habitat/Restoration and ADNR
Publication_Date: 1996
Title: EVOS Research and Restoration CD-ROM
Series_Information:
Series_Name: State Coastline
Issue_Identification: coastst
Publication_Information:
Publication_Place: Anchorage, AK
Publisher: ADNR
Source_Scale_Denominator: 63360
Type_of_Source_Media: CD-ROM
Source_Time_Period_of_Content:
Time_Period_Information:
Single_Date/Time:
Calendar_Date: 1989
Source_Currentness_Reference: ground condition
Source_Citation_Abbreviation: none
Source_Contribution: Was used to fill in missing areas of data.

Process_Step:
Process_Description:
From the DNR, LRIS hydrogrpahy, the arcs were selected where water-type = 'S' for shoreline or 'N' for null (closing mouth of streams). This information was used first as it had the most logical coding for arc attributes. The USGS information was downloaded from the web where holes existed. EVOS was used to fill in also. USFS, Chugach was used to completely replace the Prince William Sound area. The statewide 1:250000 alaska coastline was used to fill in where no other data was available. Attributes are structured the same as the ADNR, LRIS hydrography and were added. The attributes were not qc'ed and has errors.
Process_Date: 19980101

Spatial_Data_Organization_Information:
Direct_Spatial_Reference_Method: Vector
Point_and_Vector_Object_Information:
SDTS_Terms_Description:
SDTS_Point_and_Vector_Object_Type: Point
Point_and_Vector_Object_Count: 36614
SDTS_Terms_Description:
SDTS_Point_and_Vector_Object_Type: String
Point_and_Vector_Object_Count: 64221
SDTS_Terms_Description:
SDTS_Point_and_Vector_Object_Type: GT-polygon composed of chains
Point_and_Vector_Object_Count: 36614

Spatial_Reference_Information:
Horizontal_Coordinate_System_Definition:
Planar:
Map_Projection:
Map_Projection_Name: Albers Conical Equal Area
Albers_Conical_Equal_Area:
Standard_Parallel: 55
Standard_Parallel: 65

```
                Longitude_of_Central_Meridian: -154
                Latitude_of_Projection_Origin: 50
                False_Easting: 0.00000
                False_Northing: 0.00000
            Planar_Coordinate_Information:
                Planar_Coordinate_Encoding_Method: coordinate pair
                Coordinate_Representation:
                    Abscissa_Resolution: 1.0
                    Ordinate_Resolution: 1.0
                Planar_Distance_Units: METERS
        Geodetic_Model:
            Horizontal_Datum_Name: North American Datum of 1927
            Ellipsoid_Name: Clarke 1866
            Semi-major_Axis: 6378206.4
            Denominator_of_Flattening_Ratio: 294.98

Entity_and_Attribute_Information:
    Detailed_Description:
        Entity_Type:
            Entity_Type_Label: COAST63.AAT
            Entity_Type_Definition: arc attributes
            Entity_Type_Definition_Source: ARC/INFO
        Attribute:
            Attribute_Label: SOURCE
            Attribute_Definition: Source where the feature came from
            Attribute_Definition_Source: From the metadata or map
            Attribute_Domain_Values:
                Unrepresentable_Domain: Varies on name of source
        Attribute:
            Attribute_Label: SCALE
            Attribute_Definition: Scale of the source where the feature came from
            Attribute_Definition_Source: From the metadata or map
            Attribute_Domain_Values:
                Enumerated_Domain:
                    Enumerated_Domain_Value: 63360, 250000 or other.
                    Enumerated_Domain_Value_Definition: scale denominator of source
                    Enumerated_Domain_Value_Definition_Source: See SOURCE
        Attribute:
            Attribute_Label: DATE
            Attribute_Definition: Date of the source where the feature came from
            Attribute_Definition_Source: From the metadata or map
            Attribute_Domain_Values:
                Unrepresentable_Domain: Varies on date of source
        Attribute:
            Attribute_Label: NAME
            Attribute_Definition: Name of feature
            Attribute_Definition_Source: From hardcopy map
            Attribute_Domain_Values:
                Unrepresentable_Domain: Varies on location
        Attribute:
            Attribute_Label: WATER-TYPE
            Attribute_Definition: Type of feature
            Attribute_Definition_Source: ADNR, LRIS
            Attribute_Domain_Values:
                Enumerated_Domain:
                    Enumerated_Domain_Value: S - shore; N - null; U - usa/canada border
                    Enumerated_Domain_Value_Definition: see above
                    Enumerated_Domain_Value_Definition_Source: ADNR, LRIS

    Overview_Description:
        Entity_and_Attribute_Overview:
            Attributes were added to keep track of the source of the feature and to provide other geographic information.
        Entity_and_Attribute_Detail_Citation: none
```

Distribution_Information:
Distributor:
Contact_Information:
Contact_Organization_Primary:
Contact_Organization:
AK Department of Natural Resources - Land Records Information Section
Contact_Position: GIS Public Access Coordinator
Contact_Address:
Address_Type: mailing and physical address
Address: 550 W. 7th Suite 706
City: Anchorage
State_or_Province: AK
Postal_Code: 99501
Country: USA
Contact_Voice_Telephone: 907/269-8833
Contact_Facsimile_Telephone: 907/269-8920
Contact_Electronic_Mail_Address: GIS_Public_Access@dnr.state.ak.us
Hours_of_Service: 800-1600 AST
Contact_Instructions:
Fax completed "Request for DNR GIS Data" form. Form can be found at
<URL:http://www.asgdc.state.ak.us/homehtml/orderform.html>

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Standard_Order_Process:
Digital_Form:
Digital_Transfer_Information:
Format_Name: ARC
Format_Version_Number: 7.1.1
Format_Version_Date: 02061997
Transfer_Size: 124 for CD
Digital_Transfer_Option:
Offline_Option:
Offline_Media: CD-ROM
Recording_Format: CD
Fees: $150, includes other data.

Metadata_Reference_Information:
Metadata_Date: 19990510
Metadata_Review_Date: 19990510
Metadata_Future_Review_Date: 20000101
Metadata_Contact:
Contact_Information:
Contact_Organization_Primary:
Contact_Organization: ADNR, LRIS, GIS Unit
Contact_Person: Dorothy Mortenson
Contact_Position: GIS Manager
Contact_Address:
Address_Type: mailing and physical address
Address: 550 W. 7th Suite 706
City: Anchorage
State_or_Province: AK
Postal_Code: 99501
Country: USA
Contact_Voice_Telephone: 907/269-8852
Contact_Facsimile_Telephone: 907/563-1597
Contact_Electronic_Mail_Address: dorothy_mortenson@dnr.state.ak.us
Hours_of_Service: 800-1600 AST

Metadata_Standard_Name: FGDC Content Standards for Digital Geospatial Metadata
Metadata_Standard_Version: FGDC-STD-001-1998
Metadata_Time_Convention: Local Time
Metadata_Access_Constraints: none
Metadata_Use_Constraints:
Coverage is new and subject to change without notice. Use caution in referencing this document.

If the user has modified the data in any way they are obligated to describe the types of modifications they have performed in the supporting metadata file. User specifically agrees not to imply that changes they made were approved by the Alaska Department of Natural Resources.

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