

Identification\_Information:

Citation:

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Point\_of\_Contact:

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Description:

Abstract:

This data set contains the rock unit polygons for the surficial geology in ESRI shapefile format for the Delaware Coastal Plain covered by DGS Geologic Map No. 12 (Lewes-Cape Henlopen area). The original Geologic Map Description of the published map follows:

The surficial geology of the Lewes and Cape Henlopen quadrangles reflects the geologic history of the Delaware Bay estuary and successive high and low stands of sea levels during the Quaternary. The subsurface Beaverdam Formation was deposited as part of a fluvial-estuarine system during the Pliocene, the sediments of which now form the core of the Delmarva Peninsula. Following a period of glacial outwash during the early Pleistocene represented by the Columbia Formation found to the northwest of the map area (Ramsey, 1997), the Delaware River and Estuary developed their current positions. The Lynch Heights and Scotts Corners formations (Ramsey, 1993, 1997, 2001) represent shoreline and estuarine deposits associated with high stands of sea level during the middle to late Pleistocene on the margins of the Delaware Estuary. In the map area, the Lynch Heights Formation includes relict spit and dune deposits at the ancestral intersection of the Atlantic Coast and Delaware Bay systems, similar in geomorphic position to the modern Cape Henlopen.

The relationship between the Lynch Heights and Scotts Corners is shown in cross-section A-A'. The Lynch Heights is composed of a fine, well-sorted sand. The break in topography (scarp) between the surface of the Lynch Heights (at approx. 25 ft and higher) and that of the Scotts Corners (at approx. 6 to 15 feet) represents ancestral shorelines of Delaware Bay during a high sea level contemporaneous with the deposition of the Scotts Corners. The cross section also shows two depositional units within the Scotts Corners. A younger shoreline sequence with sand at the land surface has cut into an older unit (marked by silt at the land surface). Gravel beds within both units represent shoreline deposits like those found along the modern Delaware Bay in the area. Two depositional units within the Scotts Corners is consistent with observations of the Scotts Corners by Ramsey (1997) just to the north of the map area. Both of these units were deposited during the last interglacial period. The older unit may be attributed to the high sea stand at 120,000 years B.P. and the younger unit to one at 80,000 years B.P. (Ramsey, 1997).

Quaternary deposits were transgressed by Holocene swamp, marsh, shoreline, estuarine and spit deposits. The spit deposits form the modern Cape Henlopen (Ramsey, et al., 2000, Ramsey, 1999). Cross-section B-B' depicts sediment distribution within the Cape Henlopen complex and stratigraphic relationships with units underlying the Holocene spit deposits.

Offshore surficial sediment distribution is a compilation of historical offshore core and grab sample textural descriptions and data (Hoyt, 1982, Maley, 1981, Marx, 1981, Oostdam, 1971, Sheridan et al., 1974, Strom, 1972, 1976, Terchunian, 1985, Weil, 1976, Wethe et al., 1982, 1982a, 1983 and unpublished data in DGS files). From core descriptions, the top six inches was used as the surficial sediment type. Sediment textures shown on the map show a general distribution of sediment size over a large area. Site-specific information about bottom sediment textures may require additional sampling. Refer to the adjacent triangular diagram for sediment texture abbreviations. Historical shoreline positions are from historical U.S. Coast & Geodetic Survey T-sheets (1884) and topographic maps (1944, 1977).

Stratigraphic units found at depth within the map area are shown with the geophysical log of Ni31-07, a 1035-foot deep geothermal test hole drilled in 1978 for the U.S. Department of Energy. Major aquifer units are also shown (Andres, 1986).

Purpose: To facilitate the GIS community of Delaware and to release the geologic map of the Lewes and Cape Henlopen Quadrangles with all cartographic elements (including geologic symbology, text, etc.) in a form usable in a GIS, we have released this digital ESRI shapefile of DGS Geological Map 12. The update of earlier work and mapping of new units is important not only to geologists, but also to hydrologists who wish to understand the distribution of water resources, to engineers who need bedrock information during construction of roads and buildings, to government officials and agencies who are planning for residential and commercial growth, and to citizens who are curious about the bedrock under their homes. Formal names are assigned to all rock units according

to the guidelines of the 1983 North American Stratigraphic Code (NACSN, 1983).

Time\_Period\_of\_Content:

Currentness\_Reference: Publication Date

Time\_Period\_Information:

Single\_Date/Time:

Calendar\_Date: 2003

Status:

Progress: complete

Maintenance\_and\_Update\_Frequency: none planned

Keywords:

Theme:

Theme\_Keyword\_Thesaurus: none

Theme\_Keyword: geoscientificInformation

Theme\_Keyword: Delaware

Theme\_Keyword: Delaware Geology

Theme\_Keyword: geology

Theme\_Keyword: coastal plain geology

Theme\_Keyword: environment

Place:

Place\_Keyword: Delaware

Place\_Keyword: Sussex County

Place\_Keyword: Lewes

Place\_Keyword: Cape Henlopen

Place\_Keyword: great marsh

Place\_Keyword: Fort Miles

Place\_Keyword: State Park

Place\_Keyword:

Place\_Keyword\_Thesaurus: USGS GNIS

Access\_Constraints: None-Please give proper credit to the Delaware Geological Survey. Please reference as follows: Ramsey, K. W., 2003: Geologic Map of the Lewes and Cape Henlopen Quadrangles: Delaware Geological Survey Geologic Map No. 12.

Use\_Constraints: The Delaware Geological Survey (DGS) is constantly gathering data from multiple sources, interpreting the data, and reflecting its interpretations on maps. DGS's interpretations of multiple data sources are reflected in this map available for download. Reasonable efforts have been made by DGS to verify that this digital shapefile accurately interprets the source data used in its preparation; however, this map may contain omissions and errors in scale, resolution, rectification, positional accuracy, development methodology, interpretations of source data, and other circumstances. This map is also date specific and as additional data becomes available and as verification of source data continues, this map may be reinterpreted and updated by DGS without notification. The DGS maintains a digital geologic polygon layer on which these changes may be reflected. Please check the metadata for these layers to verify any updates. This map was prepared for a scale of 1:24,000 and should not be used at larger scales for denotation of rock unit boundaries. Nothing contained herein shall be deemed an expressed or implied waiver of the sovereign immunity of the State of Delaware or its duly authorized representatives, agents, or employees.

Native\_Data\_Set\_Environment: Microsoft Windows XP Version 5.1 (Build 2600) Service Pack 2; ESRI ArcCatalog 9.2.4.1420

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Distribution\_Information:  
  Distributor:  
    Contact\_Information:  
      Contact\_Organization\_Primary:  
        Contact\_Organization: Delaware Geological Survey, University of  
Delaware  
        Contact\_Person: Digital Data Coordinator  
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        Address\_Type: mailing and physical address  
        City: Newark  
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        Postal\_Code: 19716-7501  
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        Hours\_of\_Service: Mon - Fri; 8:00am to 4:30pm EST  
Resource\_Description: Downloadable Data  
Standard\_Order\_Process:  
  Digital\_Form:  
    Digital\_Transfer\_Information:  
      Transfer\_Size: 0.774  
Metadata\_Reference\_Information:  
  Metadata\_Contact:  
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      Contact\_Address:  
        City: Newark  
        State\_or\_Province: Delaware  
        Postal\_Code: 19716-7501  
        Address\_Type: mailing and physical address  
        Country: USA  
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        Address: University of Delaware  
      Contact\_Organization\_Primary:  
        Contact\_Person: Digital Data Coordinator  
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        Hours\_of\_Service: Mon - Fri; 8:00am to 4:30pm EST  
    Metadata\_Date: 20080523  
    Metadata\_Standard\_Name: FGDC Content Standards for Digital Geospatial  
Metadata

Metadata\_Standard\_Version: FGDC-STD-001-1998  
Metadata\_Time\_Convention: local time  
Metadata\_Extensions:  
  Online\_Linkage: <http://www.esri.com/metadata/esriprof80.html>  
  Profile\_Name: ESRI Metadata Profile

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  Positional\_Accuracy:  
    Vertical\_Positional\_Accuracy:  
      Quantitative\_Vertical\_Positional\_Accuracy\_Assessment:  
        Vertical\_Positional\_Accuracy\_Value: 2.5 feet and 5 feet  
        Vertical\_Positional\_Accuracy\_Explanation: The accuracy of the topographic base map (contour layer) is plus or minus one half the contour interval. The contour interval of the maps used in this construction was 5 feet in the Delaware Coastal Plain area and 10 feet in the Delaware Piedmont area which gives a plus or minus 5 foot and 10 foot vertical accuracy, respectively, according to National Map Accuracy Standards.      Horizontal\_Positional\_Accuracy:  
        Quantitative\_Horizontal\_Positional\_Accuracy\_Assessment:  
          Horizontal\_Positional\_Accuracy\_Value: 40 feet  
          Horizontal\_Positional\_Accuracy\_Explanation: These geologic polygons were mapped onto 1:24,000 scale topographic maps. The accuracy of those maps is plus or minus 40 feet according to National Map Accuracy Standards.    Spatial\_Data\_Organization\_Information:  
      Direct\_Spatial\_Reference\_Method: Vector  
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        SDTS\_Terms\_Description:  
          SDTS\_Point\_and\_Vector\_Object\_Type: G-polygon  
          Point\_and\_Vector\_Object\_Count: 539    Spatial\_Reference\_Information:  
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              Longitude\_of\_Central\_Meridian: -75.416667  
              Latitude\_of\_Projection\_Origin: 38.000000  
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              False\_Northing: 0.000000  
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            Planar\_Coordinate\_Encoding\_Method: coordinate pair  
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          Denominator\_of\_Flattening\_Ratio: 298.257222    Entity\_and\_Attribute\_Information:  
      Detailed\_Description:

Entity\_Type:  
  Entity\_Type\_Label: geomap12  
Attribute:  
  Attribute\_Label: FID  
  Attribute\_Definition: Internal feature number.  
  Attribute\_Definition\_Source: ESRI  
  Attribute\_Domain\_Values:  
    Unrepresentable\_Domain: Sequential unique whole numbers that are automatically generated.  
Attribute:  
  Attribute\_Label: Shape  
  Attribute\_Definition: Feature geometry.  
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Attribute:  
  Attribute\_Label: GEO\_UNIT\_S  
  Attribute\_Definition: Geologic Unit Symbol. The Geologic Unit Symbol for Delaware geologic units. Symbols are documented in DGS Stratigraphy web page.  
Attribute:  
  Attribute\_Label: GEO\_UNIT\_N  
  Attribute\_Definition: Geologic Unit Name. The Geologic Unit Name for Delaware geologic units. Geologic Unit Names are documented in DGS Stratigraphic web page.  
Attribute:  
  Attribute\_Label: GEO\_UNIT\_A  
  Attribute\_Definition: Geologic Unit Age. The ages have been assigned to each geologic unit based on a variety of geologic interpretations including: stratigraphic position and relationship; macro and microfossil content, and radiogenic analyses.