Wave Energy Assessment for the United States and Puerto Rico

Tags

Wave Energy, Assessment, WaveWatchIII Grids, Power Density, Energy Period, Significant Wave Height, Hindcast Direction, Study Water Depth, National Renewable Energy Laboratory, NREL, Electric Power Research Institute, EPRI, Virginia Tech, VT

Summary

This data is representing Wave Hindcast Direction.

Bathymetric effects are known to have a large effect on wave characteristics at depths shallower than approximately 20m (~65 ft) on the Atlantic coast and 50 m (~160 ft) on the Pacific coast. A variance between depths exists due to the feature differences for each continental shelf. The methodology used in this resource assessment precludes providing site-specific information to such developers. Reliable site-specific information in shallow waters can only be produced using results from models with higher spatial resolution that include shallow-water physics. The wave resource assessment group acknowledges that its results will not be accurate in the shallower waters of the inner continental shelf. These shallow water regions are located within the dark gray boundaries on the map.

Description

Grids are derived from WaveWatch III grids. Near the coast of the lower 48 and HI, grids are squares, 4 minutes by 4 minutes (15 per degree).

For the Alaska grids AK and BS, the grid is 4 minutes of latitude by 8 minutes of longitude (15 per deg by 7.5 per deg).

EXCEPT: The area in the Bering Sea around the Pribilof (St Paul and St George) Islands is 10 min lat by 15 min lon. Limits: 55.666 to 58.000 N, -172.000 to - 168.000 E, 17 cols, 15 rows

Farther offshore, the grid is 10 min by 10 min. (only seen in WM and PR)The 10 min by 10 min grid appears near the edge of a few grids: - SW corner of WM (off Mexican coast) - SE corner of WM (deep water) - PR - around edges (far from PR and US territory)

Credits

The Wave Energy Resource Assessment project is a joint venture between NREL, EPRI, and Virginia Tech. EPRI is the prime contractor, Virginia Tech is responsible for development of the models and estimating the wave resource, and NREL serves as an independent validator and also develops the final GIS-based display of the data. Website: http://en.openei.org/datasets/node/868

Use limitations

There are no access and use limitations for this item.

Extent
 West -179.933000 **East** 179.934000
 North 63.000000 **South** 16.833000

Scale Range
 Maximum (zoomed in) 1:5,000,000
 Minimum (zoomed out) 1:20,000,000

ArcGIS Metadata

Topics and Keywords

 * CONTENT TYPE Downloadable Data

Citation

 TITLE Wave Energy Assessment for the United States and Puerto Rico
 PUBLICATION DATE 2011-09-27 00:00:00

 PRESENTATION FORMATS * digital map

Citation Contacts

 RESPONSIBLE PARTY
  ORGANIZATION'S NAME National Renewable Energy Laboratory
  CONTACT'S ROLE owner

   CONTACT INFORMATION
    ADDRESS
     TYPE both
     DELIVERY POINT 1617 Cole Blvd.
     CITY Golden
     ADMINISTRATIVE AREA CO
     POSTAL CODE 80401
     COUNTRY US

Resource Details

 DATASET LANGUAGES English (UNITED STATES)
 DATASET CHARACTER SET utf8 - 8 bit UCS Transfer Format

 SPATIAL REPRESENTATION TYPE * vector

 * PROCESSING ENVIRONMENT Version 6.2 (Build 9200) ; Esri ArcGIS 10.8.1.14362

 CREDITS
  The Wave Energy Resource Assessment project is a joint venture between NREL, EPRI, and
  Virginia Tech. EPRI is the prime contractor, Virginia Tech is responsible for development of
  the models and estimating the wave resource, and NREL serves as an independent validator
  and also develops the final GIS-based display of the data. Website:
  http://en.openei.org/datasets/node/868

 ARCGIS ITEM PROPERTIES
  * NAME wave_hindcast_direction_v2
  * SIZE 1.132

* LOCATION
  * ACCESS PROTOCOL   Local Area Network

Extents

EXTENT
  GEOGRAPHIC EXTENT
    BOUNDING RECTANGLE
      EXTENT TYPE   Extent used for searching
      * WEST LONGITUDE   -179.933000
      * EAST LONGITUDE   179.934000
      * NORTH LATITUDE   63.000000
      * SOUTH LATITUDE   16.833000
      * EXTENT CONTAINS THE RESOURCE   Yes

EXTENT IN THE ITEM'S COORDINATE SYSTEM
  * WEST LONGITUDE   -20030049.936906
  * EAST LONGITUDE   20030161.256397
  * SOUTH LATITUDE   1901393.888329
  * NORTH LATITUDE   9100250.907060
  * EXTENT CONTAINS THE RESOURCE   Yes

Resource Points of Contact

POINT OF CONTACT
  ORGANIZATION'S NAME   National Renewable Energy Laboratory
  CONTACT'S ROLE   point of contact

    CONTACT INFORMATION   ►
      ADDRESS
        TYPE   both
        DELIVERY POINT   1617 Cole Blvd.
        CITY Golden
        ADMINISTRATIVE AREA CO
        POSTAL CODE 80401
        COUNTRY US

Spatial Reference

ARCGIS COORDINATE SYSTEM
  * TYPE   Projected
  * GEOGRAPHIC COORDINATE REFERENCE   GCS_WGS_1984
  * PROJECTION   WGS_1984_Web_Mercator_Auxiliary_Sphere
  * COORDINATE REFERENCE DETAILS
    PROJECTED COORDINATE SYSTEM
      WELL-KNOWN IDENTIFIER   102100
      X ORIGIN   -22041257.77387803
      Y ORIGIN   -30241100
      XY SCALE   144148035.89861274
      Z ORIGIN   -100000
      Z SCALE   10000
      M ORIGIN   -100000
      M SCALE   10000
      XY TOLERANCE   0.001
      Z TOLERANCE   0.001
      M TOLERANCE   0.001
      HIGH PRECISION   true
      LATEST WELL-KNOWN IDENTIFIER   3857
      WELL-KNOWN TEXT PROJCS["WGS_1984_Web_Mercator_Auxiliary_Sphere",GEOGCS
      ["GCS_WGS_1984",DATUM["D_WGS_1984",SPHEROID
      ["WGS_1984",6378137.0,298.257223563]],PRIMEM["Greenwich",0.0],UNIT

["Degree",0.0174532925199433]],PROJECTION["Mercator_Auxiliary_Sphere"],PARAMETER
["False_Easting",0.0],PARAMETER["False_Northing",0.0],PARAMETER
["Central_Meridian",0.0],PARAMETER["Standard_Parallel_1",0.0],PARAMETER
["Auxiliary_Sphere_Type",0.0],UNIT["Meter",1.0],AUTHORITY["EPSG",3857]]

REFERENCE SYSTEM IDENTIFIER
* VALUE 3857
* CODESPACE EPSG
* VERSION 8.8(9.3.1.2)

Spatial Data Properties

VECTOR
* LEVEL OF TOPOLOGY FOR THIS DATASET   geometry only

GEOMETRIC OBJECTS
FEATURE CLASS NAME wave_hindcast_direction_v2
* OBJECT TYPE   point
* OBJECT COUNT   42396

ArcGIS FEATURE CLASS PROPERTIES
FEATURE CLASS NAME   wave_hindcast_direction_v2
* FEATURE TYPE   Simple
* GEOMETRY TYPE   Point
* HAS TOPOLOGY   FALSE
* FEATURE COUNT   42396
* SPATIAL INDEX   TRUE
* LINEAR REFERENCING   FALSE

Distribution

DISTRIBUTION FORMAT
* NAME File Geodatabase Feature Class

TRANSFER OPTIONS
* TRANSFER SIZE 1.132

Fields

DETAILS FOR OBJECT wave_hindcast_direction_v2
* TYPE Feature Class
* ROW COUNT 42396
DEFINITION
Object ID

FIELD OBJECTID
* ALIAS OBJECTID
* DATA TYPE OID
* WIDTH 4
* PRECISION 0
* SCALE 0
* FIELD DESCRIPTION
Internal feature number.

* DESCRIPTION SOURCE
Esri

* DESCRIPTION OF VALUES
Sequential unique whole numbers that are automatically generated.

FIELD Shape
- **ALIAS** Shape
- **DATA TYPE** Geometry
- **WIDTH** 0
- **PRECISION** 0
- **SCALE** 0
- **FIELD DESCRIPTION**
  Feature geometry.

- **DESCRIPTION SOURCE**
  Esri

- **DESCRIPTION OF VALUES**

  Coordinates defining the features.

FIELD gid
- **ALIAS** gid
- **DATA TYPE** Integer
- **WIDTH** 4
- **PRECISION** 0
- **SCALE** 0

FIELD DESCRIPTION
  GID

DESCRIPTION SOURCE
  National Renewable Energy Laboratory, Electric Power Research Institute, Virginia Tech

FIELD lat
- **ALIAS** lat
- **DATA TYPE** Double
- **WIDTH** 8
- **PRECISION** 0
- **SCALE** 0

FIELD DESCRIPTION
  Latitude

DESCRIPTION SOURCE
  National Renewable Energy Laboratory, Electric Power Research Institute, Virginia Tech

FIELD lon
- **ALIAS** lon
- **DATA TYPE** Double
- **WIDTH** 8
- **PRECISION** 0
- **SCALE** 0

FIELD DESCRIPTION
  Longitude

DESCRIPTION SOURCE
  National Renewable Energy Laboratory, Electric Power Research Institute, Virginia Tech

FIELD depth
- **ALIAS** depth
- **DATA TYPE** Double
- **WIDTH** 8
- **PRECISION** 0
- **SCALE** 0

FIELD DESCRIPTION

Water Depth

FIELD jan_hwd
* ALIAS jan_hwd
* DATA TYPE Double
* WIDTH 8
* PRECISION 0
* SCALE 0
FIELD DESCRIPTION
Average January Wave Hindcast Direction

FIELD feb_hwd
* ALIAS feb_hwd
* DATA TYPE Double
* WIDTH 8
* PRECISION 0
* SCALE 0
FIELD DESCRIPTION
Average February Wave Hindcast Direction

FIELD mar_hwd
* ALIAS mar_hwd
* DATA TYPE Double
* WIDTH 8
* PRECISION 0
* SCALE 0
FIELD DESCRIPTION
Average March Wave Hindcast Direction

FIELD apr_hwd
* ALIAS apr_hwd
* DATA TYPE Double
* WIDTH 8
* PRECISION 0
* SCALE 0
FIELD DESCRIPTION
Average April Wave Hindcast Direction

FIELD may_hwd
* ALIAS may_hwd
* DATA TYPE Double
* WIDTH 8
* PRECISION 0
* SCALE 0
FIELD DESCRIPTION

Average May Wave Hindcast Direction

FIELD jun_hwd
* ALIAS jun_hwd
* DATA TYPE Double
* WIDTH 8
* PRECISION 0
* SCALE 0
FIELD DESCRIPTION
Average June Wave Hindcast Direction

FIELD jul_hwd
* ALIAS jul_hwd
* DATA TYPE Double
* WIDTH 8
* PRECISION 0
* SCALE 0
FIELD DESCRIPTION
Average July Wave Hindcast Direction

FIELD aug_hwd
* ALIAS aug_hwd
* DATA TYPE Double
* WIDTH 8
* PRECISION 0

* SCALE 0
FIELD DESCRIPTION
Average August Wave Hindcast Direction

FIELD sep_hwd
* ALIAS sep_hwd
* DATA TYPE Double
* WIDTH 8
* PRECISION 0
* SCALE 0
FIELD DESCRIPTION
Average September Wave Hindcast Direction

FIELD oct_hwd
* ALIAS oct_hwd
* DATA TYPE Double
* WIDTH 8
* PRECISION 0
* SCALE 0
FIELD DESCRIPTION
Average October Wave Hindcast Direction

DESCRIPTION SOURCE
National Renewable Energy Laboratory, Electric Power Research Institute, Virginia Tech

FIELD nov_hwd
* ALIAS nov_hwd
* DATA TYPE Double
* WIDTH 8
* PRECISION 0
* SCALE 0
FIELD DESCRIPTION
Average Novemeber Wave Hindcast Direction

DESCRIPTION SOURCE
National Renewable Energy Laboratory, Electric Power Research Institute, Virginia Tech

FIELD dec_hwd
* ALIAS dec_hwd
* DATA TYPE Double
* WIDTH 8

* PRECISION 0
* SCALE 0
FIELD DESCRIPTION
Average December Wave Hindcast Direction

DESCRIPTION SOURCE
National Renewable Energy Laboratory, Electric Power Research Institute, Virginia Tech

FIELD ann_hwd
* ALIAS ann_hwd
* DATA TYPE Double
* WIDTH 8
* PRECISION 0
* SCALE 0
FIELD DESCRIPTION
Average Annual Wave Hindcast Direction

DESCRIPTION SOURCE
National Renewable Energy Laboratory, Electric Power Research Institute, Virginia Tech

Metadata Details

* METADATA LANGUAGE English (UNITED STATES)
METADATA CHARACTER SET   utf8 - 8 bit UCS Transfer Format

SCOPE OF THE DATA DESCRIBED BY THE METADATA   dataset
SCOPE NAME   * dataset

* LAST UPDATE 2021-10-19

ARCGIS METADATA PROPERTIES
METADATA FORMAT ArcGIS 1.0
METADATA STYLE FGDC CSDGM Metadata
STANDARD OR PROFILE USED TO EDIT METADATA FGDC

CREATED IN ARCGIS FOR THE ITEM 2021-10-19   09:44:59
LAST MODIFIED IN ARCGIS FOR THE ITEM 2021-10-19   10:35:40

AUTOMATIC UPDATES
HAVE BEEN PERFORMED Yes
LAST UPDATE 2021-10-19   10:35:22

Metadata Contacts

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  CONTACT'S POSITION GIS Assistant/Specialist
  CONTACT'S ROLE originator

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        POSTAL CODE 60439
        COUNTRY US
        E-MAIL ADDRESS khlava@anl.gov

Metadata Maintenance

MAINTENANCE
  UPDATE FREQUENCY unknown