Water Availability, Cost, and Projected Future Use

Tags

Water, water availability, water cost, projected future water use, Hydrologic Unit Code, HUC8, watershed, groundwater, wastewater, United States

Summary

This layer depicts estimated current and future consumptive water use, and supply/cost for fresh surface water, fresh groundwater, brackish groundwater and municipal wastewater, all at the 8-digit hydrologic unit level (HUC8).

Description

This layer depicts estimated current and future consumptive water use, and supply/cost for fresh surface water, fresh groundwater, brackish groundwater and municipal wastewater, all at the 8-digit hydrologic unit level (HUC8) for the eastern U.S.

Estimates of consumptive use include municipal, industrial and agricultural sectors for the years 2010 and 2030. These values were calculated using multiple state sources as well as heavy use of the USGS Water Use Data Survey 2010. Where no state data are available, the fresh surface water metric was calculated as (mean annual streamflow (USGS)*50%) - change in consumptive use. Where no state data are available, the fresh groundwater metric was calculated as

recharge (USGS) – groundwater pumping. The groundwater pumping was calculated primarily using the USGS Water Use Data Survey 2010 while supplementing in state data where available. The municipal wastewater metric was developed using wastewater values retrieved from the EPA Clean Watershed Needs Survey and the PCS/ICS query tool. Plants discharging less than 1.0 MGD (112 AFY) were not included nor were plants that are currently discharging to another user. Brackish groundwater was calculated using brackish groundwater well information from the NWIS database. Wells that showed depth to groundwater of less than

15 meters or greater than 760 meters were excluded. In addition, only salinities between 1,000 and 10,000 ppm TDS were considered.

Fresh groundwater and brackish groundwater cost metrics were calculated using a combination of pumping energy, pumping cost, well field costs, pump efficiencies, etc. The municipal wastewater cost metric was calculated using cost to lease wastewater, capital and ongoing expenses associated with conveyance, and treatment costs.

All volumes are displayed in acre-feet per year (AFY) and all cost data is displayed in U.S. dollars per acre-foot ($/AF).

Credits

Sandia National Laboratory

Use limitations

There are no access and use limitations for this item.

Extent

West -124.733887 **East** -66.966364
North 49.375673 **South** 24.960575

Scale Range

Maximum (zoomed in) 1:5,000
Minimum (zoomed out) 1:150,000,000

ArcGIS Metadata

Topics and Keywords

* CONTENT TYPE Downloadable Data

Citation

TITLE Water Availability, Cost, and Projected Future Use
PUBLICATION DATE 2016-09-01 00:00:00
PRESENTATION FORMATS * digital map

Citation Contacts

RESPONSIBLE PARTY
INDIVIDUAL'S NAME Barbie Moreland
ORGANIZATION'S NAME Sandia National Laboratories
CONTACT'S POSITION Technologist
CONTACT'S ROLE originator
CONTACT INFORMATION
PHONE
VOICE 505-284-5600
ADDRESS
TYPE physical
DELIVERY POINT PO Box 5800, MS1137
CITY Albuquerque
ADMINISTRATIVE AREA NM
POSTAL CODE 87185 COUNTRY
US

Resource Details

DATASET LANGUAGES * English (UNITED STATES)
SPATIAL REPRESENTATION TYPE * vector
* PROCESSING ENVIRONMENT Microsoft Windows 7 Version 6.1 (Build 7601) Service Pack 1; Esri ArcGIS 10.3.0.4322
CREDITS
Sandia National Laboratory
ARCGIS ITEM PROPERTIES
* NAME water_availability_snl_v3
* SIZE 0.000

Extents

EXTENT
GEOGRAPHIC EXTENT
BOUNDING RECTANGLE
EXTENT TYPE Extent used for searching
* WEST LONGITUDE -124.733887
* EAST LONGITUDE -66.966364
* NORTH LATITUDE 49.375673
* SOUTH LATITUDE 24.960575
* EXTENT CONTAINS THE RESOURCE Yes
EXTENT IN THE ITEM'S COORDINATE SYSTEM
* WEST LONGITUDE -13885312.771506
* EAST LONGITUDE -7454661.514958
* SOUTH LATITUDE 2870902.964107
* NORTH LATITUDE 6338847.275370
* EXTENT CONTAINS THE RESOURCE Yes

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 -22041545.367140558
Y ORIGIN -33272760.666300893
XY SCALE 135368852.55357128
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 8.2.6

Spatial Data Properties

VECTOR
* LEVEL OF TOPOLOGY FOR THIS DATASET geometry only

GEOMETRIC OBJECTS
FEATURE CLASS NAME water_availability_snl_v3
* OBJECT TYPE composite
* OBJECT COUNT 2939

ARCGIS FEATURE CLASS PROPERTIES
FEATURE CLASS NAME water_availability_snl_v3
* FEATURE TYPE Simple
* GEOMETRY TYPE Polygon
* HAS TOPOLOGY FALSE
* FEATURE COUNT 2939
* SPATIAL INDEX TRUE
* LINEAR REFERENCING FALSE

Distribution

DISTRIBUTION FORMAT
* NAME File Geodatabase Feature Class

TRANSFER OPTIONS
* TRANSFER SIZE 0.000

Fields

DETAILS FOR OBJECT water_availability_snl_v3
* TYPE Feature Class
* ROW COUNT 2939

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 State_HUC8
* ALIAS State_HUC8
* DATA TYPE String
* WIDTH 50
* PRECISION 0
* SCALE 0

FIELD DESCRIPTION
Hydrologic Unit Code and State

DESCRIPTION SOURCE
SNL

FIELD Fresh_SW
* ALIAS Fresh_SW
* DATA TYPE Double
* WIDTH 8
* PRECISION 0
* SCALE 0
FIELD DESCRIPTION
Fresh Surface Water (Acre-Feet/Year)
DESCRIPTION SOURCE
SNL

FIELD Fresh_GW
* ALIAS Fresh_GW
* DATA TYPE Double
* WIDTH 8
* PRECISION 0
* SCALE 0
FIELD DESCRIPTION
Fresh Groundwater (Acre-Feet/Year)
DESCRIPTION SOURCE
SNL

FIELD Brack_GW
* ALIAS Brack_GW
* DATA TYPE Double
* WIDTH 8
* PRECISION 0
* SCALE 0
FIELD DESCRIPTION
Brackish Groundwater (Acre-Feet/Year)
DESCRIPTION SOURCE
SNL

FIELD WasteWater
* ALIAS WasteWater
* DATA TYPE Double
* WIDTH 8
* PRECISION 0
* SCALE 0
FIELD DESCRIPTION
Municipal Wastewater (Acre-Feet/Year)
DESCRIPTION SOURCE
SNL

FIELD FrshGWCost
* ALIAS FrshGWCost
* DATA TYPE Double
* WIDTH 8
* PRECISION 0
* SCALE 0
FIELD DESCRIPTION
Fresh Groundwater Cost ($/Acre-Foot)
DESCRIPTION SOURCE
SNL

FIELD BrckGWCost
* ALIAS BrckGWCost
* DATA TYPE Double
* WIDTH 8
* PRECISION 0
* SCALE 0
FIELD DESCRIPTION
Brackish Water Cost ($/Acre-Foot)
DESCRIPTION SOURCE
SNL

FIELD WW_Cost
* ALIAS WW_Cost
* DATA TYPE Double
* WIDTH 8
* PRECISION 0
* SCALE 0
FIELD DESCRIPTION
Municipal Wastewater Cost ($/Acre-Foot)

DESCRIPTION SOURCE
SNL

FIELD SW_AOC_1
* ALIAS SW_AOC_1
* DATA TYPE String
* WIDTH 50
* PRECISION 0
* SCALE 0
FIELD DESCRIPTION
Surface Water Area of Concern
DESCRIPTION SOURCE
SNL

FIELD GW_AOC
* ALIAS GW_AOC
* DATA TYPE String
* WIDTH 50
* PRECISION 0
* SCALE 0
FIELD DESCRIPTION
Groundwater Area of Concern
DESCRIPTION SOURCE
SNL

FIELD State
* ALIAS State
* DATA TYPE String
* WIDTH 50
* PRECISION 0
* SCALE 0
FIELD DESCRIPTION
State Name
DESCRIPTION SOURCE
SNL

FIELD FreshSWCos
* ALIAS FreshSWCos
* DATA TYPE Double
* WIDTH 8
* PRECISION 0
* SCALE 0
FIELD DESCRIPTION
Fresh Surface Water Cost ($/Acre-Foot)
DESCRIPTION SOURCE
SNL

FIELD Curr_CU
* ALIAS Curr_CU
* DATA TYPE Double
* WIDTH 8
* PRECISION 0
* SCALE 0
FIELD DESCRIPTION
Current Consumptive Use (Acre-Feet/Year)
DESCRIPTION SOURCE
SNL

FIELD Future_CU
* ALIAS Future_CU
* DATA TYPE Double
* WIDTH 8
* PRECISION 0
* SCALE 0
FIELD DESCRIPTION
Future Consumptive Use (2030) (Acre-Feet/Year)
DESCRIPTION SOURCE
SNL

FIELD Chg_in_CU
* ALIAS Chg_in_CU
* DATA TYPE Double
* WIDTH 8
* PRECISION 0
* SCALE 0

FIELD DESCRIPTION
Change in Consumptive Use (Acre-Feet/Year)
DESCRIPTION SOURCE
SNL

FIELD Frsh_Chg
* ALIAS Frsh_Chg
* DATA TYPE Double
* WIDTH 8
* PRECISION 0
* SCALE 0
FIELD DESCRIPTION
Fresh Sources Minus Change in Consumptive Use (Acre-Feet/Year)
DESCRIPTION SOURCE
SNL

Hide Field Frsh_Chg ▲

FIELD All_Chg ►
* ALIAS All_Chg
* DATA TYPE Double
* WIDTH 8
* PRECISION 0
* SCALE 0
FIELD DESCRIPTION
All Sources Minus Change in Consumptive Use (Acre-Feet/Year)

DESCRIPTION SOURCE
SNL

FIELD Name
* ALIAS Name
* DATA TYPE String
* WIDTH 50
* PRECISION 0
* SCALE 0
FIELD DESCRIPTION
Hydrologic Unit Name
DESCRIPTION SOURCE
SNL

FIELD App_SW
* ALIAS App_SW
* DATA TYPE Double
* WIDTH 8
* PRECISION 0
* SCALE 0
FIELD DESCRIPTION
Appropriated Surface Water Availability (Acre-Feet/Year)
DESCRIPTION SOURCE
SNL

FIELD AppSWCost
* ALIAS AppSWCost
* DATA TYPE Double
* WIDTH 8
* PRECISION 0
* SCALE 0
FIELD DESCRIPTION
Appropriated Surface Water Cost ($/Acre-Foot)
DESCRIPTION SOURCE
SNL

FIELD Shape_Length
* ALIAS Shape_Length
* DATA TYPE Double
* WIDTH 8
* PRECISION 0
* SCALE 0
* FIELD DESCRIPTION
Length of feature in internal units.
* DESCRIPTION SOURCE
Esri
* DESCRIPTION OF VALUES

Positive real numbers that are automatically generated.

FIELD Shape_Area
* ALIAS Shape_Area
* DATA TYPE Double
* WIDTH 8
* PRECISION 0
* SCALE 0
* FIELD DESCRIPTION
  Area of feature in internal units squared.
* DESCRIPTION SOURCE
  Esri
* DESCRIPTION OF VALUES
  Positive real numbers that are automatically generated.

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 2016-10-05

ARCGIS METADATA PROPERTIES

METADATA FORMAT ArcGIS 1.0

METADATA STYLE FGDC CSDGM Metadata

STANDARD OR PROFILE USED TO EDIT METADATA FGDC

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AUTOMATIC UPDATES

HAVE BEEN PERFORMED Yes

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