

Colorado Current Cost Condition

Data format: Polygon Dataset - ESRI shapefile

File or table name: co_cur_cst_cnd

Coordinate system: Albers Conical Equal Area

Theme keywords: Cost, Haul Cost, Forestry, Log Skidding, Colorado

Abstract: This model is designed to be used in concert with the Woody Bio_mass for the State of Colorado (co_woody_biomass) model to determine the economic availability of woody bio-mass for the State of Colorado. This model depicts hauling and harvest cost of the extraction of woody bio-mass by sixth level watershed (HUC12) for the State of Colorado.

FGDC and ESRI Metadata:

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Metadata elements shown with blue text are defined in the Federal Geographic Data Committee's (FGDC) [Content Standard for Digital Geospatial Metadata \(CSDGM\)](#). Elements shown with green text are defined in the [ESRI Profile of the CSDGM](#). Elements shown with a green asterisk (*) will be automatically updated by ArcCatalog. ArcCatalog adds hints indicating which FGDC elements are mandatory; these are shown with gray text.

Identification Information:

Citation:

Citation information:

Originators: ERIA Consultants, LLC, The Greenland Reserve, and JW Associates Inc.

Title:

Colorado Current Cost Condition

***File or table name:** co_cur_cst_cnd

Publication date: 20090614

***Geospatial data presentation form:** Environmental Systems Research Institute (ESRI) shapefile

Series information:

Series name: Version 1.0

Issue identification: 20090614

Publication information:

Publication place: Boulder, Colorado

Publisher: Michael F. Tuffly

Description:

Abstract:

This model uses average distance and average slope by sixth level watershed (HUC12) for the State of Colorado to depict hauling and harvesting cost of woody bio-mass. This model is designed to be used with the Woody Bio-Mass model (co_woody_biomass) to determine the economic availability of woody bio-mass in the State of Colorado.

Purpose:

The product's intended use is to allow the user to generally evaluate the cost for hauling and harvesting woody bio-mass in Colorado.

This cost surface is combined with the woody-biomass surface to allow the user to compare and analyze different spatial combinations of cost and volume of woody bio-mass in the State of Colorado.

Supplemental information:

Three primary data sets were used in this analysis and are as follows:

- 1) **Watersheds.** Source: United States Department of Agriculture Service Center Agencies (1999). The six level watershed (HUC12) for the entire State of Colorado (Appendix I). Converted to 30 meter by 30 meter ESRI GRID cells.
- 2) **Slope. Source:** United States Geological Survey Digital Elevation Model (DEM). Slope was created in percent. Data were in 30 meter by 30 meter ESRI GRID cells.
- 3) **City Location: Source:** Tele Atlas North America, Inc., **Environmental Systems Research Institute (ESRI) (2008).**

Analysis

The watershed (HUC12) polygon data were converted to 30 meter by 30 meter GRID cells. Euclidean distance was generated for the entire State of Colorado in 30 meter by 30 meter GRID cells using the city polygon of Colorado Springs as a sole source. Euclidean distance was converted from meters to miles then averaged by watershed (HUC12). A 30 meter by 30 meter slope GRID was generated for the State of Colorado in percent. Slope was also averaged by watershed (HUC12).

The COST values are calculated by using two variables and applied in a mathematical function. The variables are the average Euclidean distance (E) by watershed (HUC12) and average slope (S) by watershed (HUC12). The mathematical function is
$$((1 + S) \times \$25) + ((1.5 \times E) \times \$0.40) = \text{COST.}$$
 Note, \$25 = field cost per ton and \$0.40 = haul cost/ton-mile.

***Language of dataset:** en

Currentness reference:

publication date

Status:

Progress: Planned

Maintenance and update frequency: As needed

Spatial domain:

Bounding coordinates:

***West bounding coordinate:** -110.009015

***East bounding coordinate:** -101.339889

***North bounding coordinate:** 41.680664

***South bounding coordinate:** 36.274277

Local bounding coordinates:

***Left bounding coordinate:** -1164093.561557

***Right bounding coordinate:** -471310.050690

***Top bounding coordinate:** 2089338.823047

***Bottom bounding coordinate:** 1549932.003176

Keywords:

Theme:

Theme keywords: Cost Condition, Hauling, harvesting

Place: State of Colorado

Place keywords: State of Colorado

Place keyword thesaurus: Colorado

Access constraints: None

Use constraints:

None

Point of contact:

Contact information:

Contact organization primary:

Contact person: Michael F. Tuffly

Contact organization: ERIA Consultants, LLC

Contact position: Research Scientist

Contact address:

Address type: mailing and physical address

Address:

165 South 32nd Street

City: Boulder

State or province: Colorado

Postal code: 80305

Country: USA

Contact voice telephone: 303-449-5146

Contact electronic mail address: mtuffly@eriaconsultants.com

Hours of service: 9:00 AM - 5:00 PM MT

Data set credit:

Michael F. Tuffly

Security information:

Security classification: Unclassified

***Native dataset format:** ESRI Shapefile

***Native data set environment:**

Microsoft Windows XP Version 5.1 (Build 2600) Service Pack 2; ESRI ArcCatalog 9.1.0.722

Cross reference:

Citation information:

Originators: ERIA Consultants, LLC, The Greenland Reserve, and JW Associates Inc.

Title: Woody Bio-mass for the State of Colorado

Publication date: 20090615

Edition: 2.0

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Data Quality Information:

Attribute accuracy:

Attribute accuracy report:

30 meter by 30 meter

Process software and version: ArcGIS ver 9.3.1 With Model Builder and Spatial Analyst

Process date: 20090619

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Spatial Data Organization Information:

***Direct spatial reference method:** Vector

Point and vector object information:

SDTS terms description:

***Name:** co_cur_cst_cnd

***SDTS point and vector object type:** G-polygon

***Point and vector object count:** 3158

ESRI terms description:

- ***Name:** co_cur_cst_cnd
- ***ESRI feature type:** Simple
- ***ESRI feature geometry:** Polygon
- ***ESRI topology:** FALSE
- ***ESRI feature count:** 3158
- ***Spatial index:** TRUE
- ***Linear referencing:** FALSE

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Spatial Reference Information:

Horizontal coordinate system definition:

Coordinate system name:

- ***Projected coordinate system name:** USA_Contiguous_Albers_Equal_Area_Conic_USGS_version
- ***Geographic coordinate system name:** GCS_North_American_1983

Planar:

Map projection:

- ***Map projection name:** Albers Conical Equal Area

Albers conical equal area:

- ***Standard parallel:** 29.500000
- ***Standard parallel:** 45.500000
- ***Longitude of central meridian:** -96.000000
- ***Latitude of projection origin:** 23.000000
- ***False easting:** 0.000000
- ***False northing:** 0.000000

Planar coordinate information:

- ***Planar coordinate encoding method:** coordinate pair

Coordinate representation:

- ***Abscissa resolution:** 0.000000
- ***Ordinate resolution:** 0.000000
- ***Planar distance units:** meters

Geodetic model:

- ***Horizontal datum name:** North American Datum of 1983
- ***Ellipsoid name:** Geodetic Reference System 80
- ***Semi-major axis:** 6378137.000000
- ***Denominator of flattening ratio:** 298.257222

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Entity and Attribute Information:

Detailed description:

- ***Name:** co_cur_cst_cnd

Entity type:

- ***Entity type label:** co_cur_cst_cnd
- ***Entity type type:** Feature Class
- ***Entity type count:** 3158

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Spatial Reference Information:

Horizontal coordinate system definition:

Coordinate system name:

***Projected coordinate system name:** NAD_1983_Albers

***Geographic coordinate system name:** GCS_North_American_1983

Planar:

Map projection:

***Map projection name:** Albers Conical Equal Area

Albers conical equal area:

***Standard parallel:** 29.500000

***Standard parallel:** 45.500000

***Longitude of central meridian:** -96.000000

***Latitude of projection origin:** 23.000000

***False easting:** 0.000000

***False northing:** 0.000000

***Direct spatial reference method:** Vector

Point and vector object information:

SDTS terms description:

***Name:** co_cur_cst_cnd

***SDTS point and vector object type:** G-polygon

***Point and vector object count:** 3158

ESRI terms description:

***Name:** co_cur_cst_cnd

***ESRI feature type:** Simple

***ESRI feature geometry:** Polygon

***ESRI topology:** FALSE

***ESRI feature count:** 3158

***Spatial index:** TRUE

***Linear referencing:** FALSE

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Entity and Attribute Information:

Detailed description:

***Name:** co_cur_cst_cnd

Entity type:

***Entity type label:** co_cur_cst_cnd

***Entity type type:** Feature Class

***Entity type count:** 3158

Attribute:

***Attribute label:** FID

***Attribute alias:** FID

***Attribute definition:**

Internal feature number.

***Attribute definition source:**

ESRI

***Attribute type:** OID

***Attribute width:** 4

***Attribute precision:** 0

***Attribute scale:** 0

Attribute domain values:

***Unrepresentable domain:**

Sequential unique whole numbers that are automatically generated.

Attribute:

***Attribute label:** OBJECTID

***Attribute alias:** OBJECTID

***Attribute definition:**

Internal feature number.

***Attribute definition source:**

ESRI

***Attribute type:** Number

***Attribute width:** 9

Attribute domain values:

***Unrepresentable domain:**

Sequential unique whole numbers that are automatically generated.

Attribute:

***Attribute label:** Shape

***Attribute alias:** Shape

***Attribute definition:**

Feature geometry.

***Attribute definition source:**

ESRI

***Attribute type:** Geometry

***Attribute width:** 0

***Attribute precision:** 0

***Attribute scale:** 0

Attribute domain values:

***Unrepresentable domain:**

Coordinates defining the features.

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Attribute:

***Attribute label:** HUC_12

***Attribute alias:** HUC_12

***Attribute type:** String

***Attribute width:** 12

Unique string identifying each HUC12 Watershed

Attribute:

***Attribute label:** HU_12_NAME

***Attribute alias:** HU_12_NAME

***Attribute type:** String

***Attribute width:** 80

Name for each HUC12

Attribute:

***Attribute label:** grid_code

***Attribute alias:** grid_code

***Attribute type:** Number

***Attribute width:** 4

Unique number identifying each HUC12 Watershed

Attribute:

***Attribute label:** avg_dis

***Attribute alias:** avg_dis

***Attribute type:** Float

***Attribute width:** 13

***Attribute number of decimals:** 11

Average distance in miles to each HUC12 watershed

Attribute:

***Attribute label:** Avg_slp

***Attribute alias:** Avg_slp

***Attribute type:** Float

***Attribute width:** 19

***Attribute number of decimals:** 11

Average slope in percent at each watershed HUC12

Attribute:

***Attribute label:** cost5

***Attribute alias:** cost5

***Attribute type:** Float

***Attribute width:** 19

***Attribute number of decimals:** 11

The cost value at each watershed using. The COST values are calculated by using two variables and applied in a mathematical function. The variables are the average Euclidean distance (E) and average slope (S). Average Euclidean Distance is measured in miles from Colorado Springs to each sixth level watershed (HUC 12) Euclidean distances are averaged by watershed. Slopes are in percent and averaged by watershed (HUC 12). The mathematical function is $((1 + S) \times \$25) + ((1.5 \times E) \times \$0.40) = \text{COST}$. Note, \$25 = field cost per ton and \$0.40 = haul cost/ton-mile. Depicted here are 3,158 sixth level watersheds (HUC12) that are contained within the State of Colorado.

Attribute:

***Attribute label:** Shape_Leng

***Attribute alias:** Shape_Leng

***Attribute type:** Float

***Attribute width:** 19

***Attribute number of decimals:** 11

Units linear meters

Attribute:

***Attribute label:** Shape_Area

***Attribute alias:** Shape_Area

***Attribute definition:**

Area of feature in internal units squared.

***Attribute definition source:**

ESRI

***Attribute type:** Float

***Attribute width:** 19

***Attribute number of decimals:** 11

Units square meters

Attribute domain values:

***Unrepresentable domain:**

Positive real numbers that are automatically generated.

Attribute:

***Attribute label:** cost_cat7

***Attribute alias:** cost_cat7

***Attribute type:** Number

***Attribute width:** 4

A user define category for summarizing cost categories by woody bio-mass volumes. Note that the woody bio-mass table must be joined to the cost table via the grid_code primary key.

Appendix I Metadata for Watersheds

Time_Period_of_Content:

Time_Period_Information:

Single_Date/Time:

Calendar_Date: 1999 - Present

Status:

Progress: In Work

Spatial_Domain:

Bounding_Coordinates:

West_Bounding_Coordinate: -109.06025

East_Bounding_Coordinate: -102.04148

North_Bounding_Coordinate: 41.00344

South_Bounding_Coordinate: 36.99242

Keywords:

Theme:

Theme_Keyword_Thesaurus: Standard for Geospatial Dataset File Naming

Theme_Keyword: Hydrologic Units, HUC, WBD

Place:

Place_Keyword_Thesaurus: GNIS

Place_Keyword: Colorado

Place_Keyword: *

Use_Constraints:

The U.S. Department of Agriculture, Service Center Agencies should be acknowledged as the data source in products derived from these data.

This data set is not designed for use as a primary regulatory tool in permitting or citing decisions, but may be used as a reference source. This information may be interpreted by organizations, agencies, units of government, or others based on needs; however, they are responsible for the appropriate application. Federal, State, or local regulatory bodies are not to reassign to the Service Center Agencies any authority for the decisions that they make. The Service Center Agencies will not perform any evaluations of these data for purposes related solely to State or local regulatory programs.

Photographic or digital enlargement of these data to scales greater than at which they were originally mapped can cause misinterpretation of the data. Digital data files are periodically updated, and users are responsible for obtaining the latest version of the data.

Point_of_Contact:

Contact_Information:

Contact_Organization_Primary:

Contact_Organization: National Cartography and Geospatial Center

Contact_Address:

Address: 501 W. Felix St, Bldg 23

City: Fort Worth

State_or_Province: Texas

Postal_Code: 76115

Data_Quality_Information:

Lineage:

Source_Information:

Source_Citation:

Citation_Information:

Originator:

NRCS State Offices

Publication_Date: 1999

Title: Watershed Boundary Data - Hydrologic Unit

Source_Scale_Denominator: 24,000

Process_Step:

Process_Description: The dataset was modified by the USDA-NRCS National Cartography & Geospatial Center (NCGC) by creating a seamless dataset for the entire country for all 4 levels. NCGC has included attributes for hydrologic unit codes and hydrologic unit names. NCGC has also added a square miles field to sub-basin. An acres field

already exists for each subbasin. The square miles and acres fields were calculated in Albers Equal Area, NAD83 by NCGC. At this time, not all records have attributes for all the fields, but may be filled in by the user for local projects or will be filled in at a later date. NCGC personnel have created 1 shapefile from the national WBD HU8. This polygons shapefile has attributes for 2-, 4-, 6- and 8-digit with polygons for the 8-digit HUs. For a complete description of the attributes and processes used to delineate hydrologic units to 1:24,000 scale accuracy, please refer to document Watershed Boundary Dataset (WBD) User Guide.

Process_Date: 200803

Spatial_Reference_Information:

Horizontal_Coordinate_System_Definition:

Geographic:

Latitude_Resolution: 0.02

Longitude_Resolution: 0.02

Geographic_Coordinate_Units: Decimal degrees

Geodetic_Model:

Horizontal_Datum_Name: North American Datum of 1983 (NAD83)

Ellipsoid_Name: GRS1980

Semi-major_Axis: 6378137.0

Denominator_of_Flattening_Ratio: 298.257222101

Entity_and_Attribute_Information:

Overview_Description:

Entity_and_Attribute_Overview:

Hydrologic Unit delineation are closed polygons that encompass all area draining toward the lowest point (called outlet or pour point) in the polygon. Because of varying sizes for the different hydrologic unit levels: some polygons do not include all areas up to the drainage divide, but all areas are included up to one or more other upstream hydrologic units. A unique hydrologic unit code is used to identify each hydrologic unit. The hydrologic unit codes start with the 2-digit Region number that contains the 4-, 6-, and 8-digit hydrologic units. Each hydrologic unit has a unique hydrologic code.

Entity_and_Attribute_Detail_Citation: Detailed information about the attributes is available from the Watershed Boundary Dataset (WBD) User Guide (wbd_user_guide.doc) that is available with each gateway request.

Distribution_Information:

Distribution_Liability:

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Standard_Order_Process:

Digital_Form:

Digital_Transfer_Information:

Format_Name: ARC/INFO Shape

Metadata_Reference_Information:

Metadata_Date: YYYY-05-DD

Metadata_Standard_Name: SCI Minimum Compliance Metadata

Metadata_Standard_Version: SCI Std 003-02