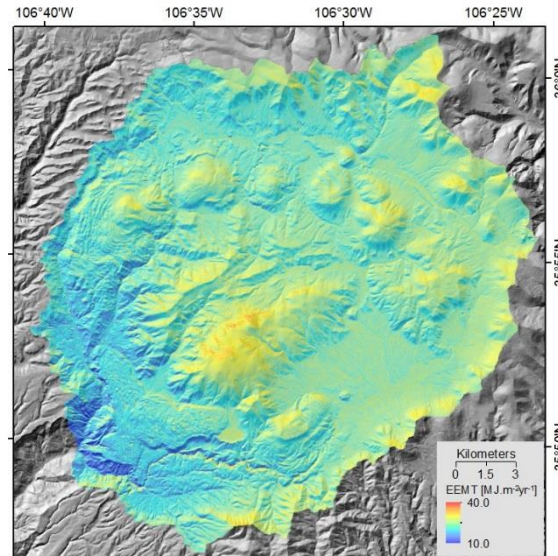


# Topographically Modified Effective Energy and Mass Transfer for Valles Caldera

## Raster Dataset



## Tags

EEMT, Energy, Mass transfer, Valles Caldera, New Mexico

## Summary

The dataset could be used to identify sampling and instrumentation locations based on the surface energy input. Computation of EEMT-topo was designed to explicitly incorporate topographic variations in solar radiation, temperature, wind speed, vapor pressure deficit and water accumulation.

## Description

Yearly topographically modified effective energy and mass transfer (EEMT-topo) ( $\text{MJ m}^{-2} \text{ yr}^{-1}$ ) was calculated for the Valles Caldera, upper part of the Jemez River basin by summing the 12 monthly values. Effective energy and mass flux varies seasonally, especially in the desert southwestern United States where contemporary climate includes a bimodal precipitation distribution that concentrates in winter (rain or snow depending on elevation) and summer monsoon periods. This seasonality of EEMT-topo can be estimated by calculating monthly values using topographic variations of solar radiation, temperature, precipitation, evapotranspiration and surface wetting as described by Rasmussen et al. (2015). The following datasets were used to compute EEMT-topo: the precipitation climatology (1981-2010) data from the [PRISM Climate Group at Oregon State University](#) at an 800-m spatial resolution; the [Jemez River Basin 2010 LiDAR](#) based DEM dataset was up-scaled to 10 m DEM; the local meteorological data (Temperature, RH, Wind Speed and Pressure) downloaded for the [Valles Caldera National Preserve Climate Stations](#) from 2003 to 2012; 2011 National Agriculture Imagery Program (NAIP) multispectral (4-band) images for the Valles Caldera downloaded from the [USGS Seamless Data Distribution](#); and MODIS Albedo 16-Day L3 Global 500m data ([MCD43A3](#)) obtained from the Land Processes Distributed Active Archive Center (LP DAAC).

## Credits

Craig Rasmussen and Matej Durcik

### Use limitations

There are no access and use limitations for this item.

## Extent

There is no extent for this item.

## Scale Range

**Maximum (zoomed in)** 1:5,000

**Minimum (zoomed out)** 1:500,000

## ArcGIS Metadata ►

## Topics and Keywords ►

THEMES OR CATEGORIES OF THE RESOURCE biota, elevation, environment

\* CONTENT TYPE Downloadable Data

EXPORT TO FGDC CSDGM XML FORMAT AS RESOURCE DESCRIPTION No

PLACE KEYWORDS Valles Caldera, Jemez River, New Mexico

STRATUM KEYWORDS Critical Zone

THEME KEYWORDS EEMT, Energy, Mass transfer, Topography

*Hide Topics and Keywords ▲*

## Citation ►

TITLE Topographically Modified Effective Energy and Mass Transfer for Valles Caldera

CREATION DATE 2015-09-23 00:00:00

PRESENTATION FORMATS \* digital map

*Hide Citation ▲*

## Citation Contacts ►

RESPONSIBLE PARTY

INDIVIDUAL'S NAME Matej Durcik

ORGANIZATION'S NAME University of Arizona

CONTACT'S ROLE author

CONTACT INFORMATION ►

ADDRESS

TYPE

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RESPONSIBLE PARTY

INDIVIDUAL'S NAME Craig Rasmussen

ORGANIZATION'S NAME University of Arizona

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CONTACT INFORMATION ►

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*Hide Contact information ▲*

*Hide Citation Contacts ▲*

**Resource Details ►**

DATASET LANGUAGES \* English (UNITED STATES)

DATASET CHARACTER SET utf8 - 8 bit UCS Transfer Format

SPATIAL REPRESENTATION TYPE \* grid

SUPPLEMENTAL INFORMATION

Detailed computation and data resources are described in the file EEMT\_topo\_description.pdf ([http://www.czo.arizona.edu/czo\\_data/PublicData/Spatial/Jemez/EEMT\\_topo\\_description.pdf](http://www.czo.arizona.edu/czo_data/PublicData/Spatial/Jemez/EEMT_topo_description.pdf)).

\* PROCESSING ENVIRONMENT Microsoft Windows 7 Version 6.1 (Build 7601) Service Pack 1; Esri ArcGIS 10.2.0.3348

CREDITS

Craig Rasmussen and Matej Durcik

ARCGIS ITEM PROPERTIES

\* NAME eemt\_topo.tif

\* LOCATION file:///C:/CZO/EEMT\_new\_clim/eemt/topo/eemt\_topo.tif

\* ACCESS PROTOCOL Local Area Network

[Hide Resource Details ▲](#)

## Extents ►

EXTENT IN THE ITEM'S COORDINATE SYSTEM

\* WEST LONGITUDE 349105.000000

\* EAST LONGITUDE 374625.000000

\* SOUTH LATITUDE 3961015.000000

\* NORTH LATITUDE 3986995.000000

\* EXTENT CONTAINS THE RESOURCE Yes

[Hide Extents ▲](#)

## Spatial Reference ►

ARCGIS COORDINATE SYSTEM

\* TYPE Projected

\* GEOGRAPHIC COORDINATE REFERENCE GCS\_North\_American\_1983

\* PROJECTION North\_American\_1983\_UTM\_Zone\_13N

\* COORDINATE REFERENCE DETAILS

PROJECTED COORDINATE SYSTEM

X ORIGIN -5120900

Y ORIGIN -9998100

XY SCALE 450445547.3910538

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

WELL-KNOWN TEXT

PROJCS["North\_American\_1983\_UTM\_Zone\_13N",GEOGCS["GCS\_North\_American\_1983",  
DATUM["D\_North\_American\_1983",SPHEROID["GRS\_1980",6378137.0,298.257222101]],P  
RIMEM["Greenwich",0.0],UNIT["Degree",0.0174532925199433]],PROJECTION["Transverse

\_Mercator"],PARAMETER["false\_easting",500000.0],PARAMETER["false\_northing",0.0],PARAMETER["central\_meridian",-105.0],PARAMETER["scale\_factor",0.9996],PARAMETER["latitude\_of\_origin",0.0],UNIT["Meter",1.0]]

#### REFERENCE SYSTEM IDENTIFIER

\* VALUE 0

[Hide Spatial Reference ▲](#)

## Spatial Data Properties ►

#### GEORECTIFIED GRID ►

\* NUMBER OF DIMENSIONS 2

#### AXIS DIMENSIONS PROPERTIES

DIMENSION TYPE column (x-axis)

\* DIMENSION SIZE 2552

\* RESOLUTION 10.000000 Meter

#### AXIS DIMENSIONS PROPERTIES

DIMENSION TYPE row (y-axis)

\* DIMENSION SIZE 2598

\* RESOLUTION 10.000000 Meter

\* CELL GEOMETRY area

\* POINT IN PIXEL center

\* TRANSFORMATION PARAMETERS ARE AVAILABLE Yes

\* CHECK POINTS ARE AVAILABLE No

#### CORNER POINTS

\* POINT 349105.000000 3961015.000000

\* POINT 349105.000000 3986995.000000

\* POINT 374625.000000 3986995.000000

\* POINT 374625.000000 3961015.000000

\* CENTER POINT 361865.000000 3974005.000000

[Hide Georectified Grid ▲](#)

## ARCGIS RASTER PROPERTIES ►

### GENERAL INFORMATION

- \* PIXEL DEPTH 32
- \* COMPRESSION TYPE None
- \* NUMBER OF BANDS 1
- \* RASTER FORMAT TIFF
- \* SOURCE TYPE continuous
- \* PIXEL TYPE floating point
- \* NO DATA VALUE -3.4028235e+038
- \* HAS COLORMAP No
- \* HAS PYRAMIDS Yes

*Hide ArcGIS Raster Properties ▲*

*Hide Spatial Data Properties ▲*

## Spatial Data Content ►

### IMAGE DESCRIPTION

- \* TYPE OF INFORMATION image

ATTRIBUTE DESCRIBED BY CELL VALUES EEMT-topo

### BAND INFORMATION

- \* DESCRIPTION EEMT-topo [MJ m<sup>-2</sup> yr<sup>-1</sup>]
- \* MAXIMUM VALUE 50.563690
- \* MINIMUM VALUE 8.800263
- \* NUMBER OF BITS PER VALUE 32

TRIANGULATION HAS BEEN PERFORMED No

RADIOMETRIC CALIBRATION IS AVAILABLE No

CAMERA CALIBRATION IS AVAILABLE No

FILM DISTORTION INFORMATION IS AVAILABLE No

LENS DISTORTION INFORMATION IS AVAILABLE No

*Hide Spatial Data Content ▲*

## Distribution ►

### DISTRIBUTION FORMAT

\* NAME Raster Dataset

[Hide Distribution ▲](#)

## 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 2016-05-05

### ARCGIS METADATA PROPERTIES

METADATA FORMAT ArcGIS 1.0

METADATA STYLE ISO 19139 Metadata Implementation Specification

STANDARD OR PROFILE USED TO EDIT METADATA ISO19139

CREATED IN ARCGIS FOR THE ITEM 2016-05-05 11:00:38

LAST MODIFIED IN ARCGIS FOR THE ITEM 2016-05-05 16:07:46

### AUTOMATIC UPDATES

HAVE BEEN PERFORMED Yes

LAST UPDATE 2016-05-05 11:00:38

[Hide Metadata Details ▲](#)

## Metadata Contacts ►

### METADATA CONTACT

INDIVIDUAL'S NAME Matej Durcik

ORGANIZATION'S NAME University of Arizona

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#### TYPE

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[Hide Contact information ▲](#)

[Hide Metadata Contacts ▲](#)