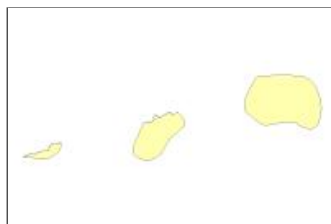


## Virginia Seismic Zones

File Geodatabase Feature Class



### Tags

earthquake, fault, Virginia, society, geoscientificInformation, environment

### Summary

This polygon feature class shows the extent of the seismically active areas of Virginia used in this study. Early in the project, it was observed that the boundaries of three recognized zones of seismic activity were not well defined. Since all of the known damaging earthquakes in Virginia have occurred generally within three seismic zones, DGMR determined that it was important to define boundaries of these zones in order to target fault compilation and outreach efforts.

### Description

This polygon feature class shows the extent of the three seismically active areas of Virginia. These boundaries were delineated based on earthquake frequency.

### Credits

This digital data is the result of a three-year project funded by the Federal Emergency Management Agency (FEMA) through the Virginia Department of Emergency Management (VDEM) and by the Virginia Department of Mines, Minerals, and Energy (VDMME) via Grant Agreement Number HMGP-DR-4042-000-014 for \$548,969. The primary authors are Anne C. Witt, Wendy S. Kelly, and Matthew J. Heller from VDMME - Division of Geology and Mineral Resources (DGMR).

Martin Chapman and Bill Henika of Virginia Tech and Chuck Bailey of the College of William and Mary served as consultants on this project and assisted with project design, the collection of earthquake and fault information, and the review of the final deliverable products. Mike Enomoto, Marques Hatfield, William Swanger, Marcie Occhi, and Aaron Cross of DGMR completed specific tasks for the project. Amy Howard of VDEM served as grant coordinator.

### Use limitations

The boundaries of the seismic zones are diffuse and earthquakes will certainly occur outside of these boundaries. These seismic zones should not be used to identify or assess seismic hazard or risk. These boundaries identify where there has historically been a greater frequency of earthquakes based on the DGMR earthquake catalog.

### Extent

**West** -83.773705 **East** -77.203106  
**North** 38.132190 **South** 36.547883

### Scale Range

**Maximum (zoomed in)** 1:50,000  
**Minimum (zoomed out)** 1:625,000

### ArcGIS Metadata ►

#### Topics and Keywords ►

THEMES OR CATEGORIES OF THE RESOURCE society, geoscientificInformation, environment

\* CONTENT TYPE Downloadable Data

EXPORT TO FGDC CSDGM XML FORMAT AS RESOURCE DESCRIPTION No

PLACE KEYWORDS Virginia

THEME KEYWORDS earthquake, fault

THEME KEYWORDS society, geoscientificInformation, environment

THESAURUS ►  
 TITLE ISO 19115 Topic Categories

[Hide Thesaurus ▲](#)

[Hide Topics and Keywords ▲](#)

## Citation ►

TITLE Virginia Seismic Zones  
 PUBLICATION DATE 2017-03-31

PRESENTATION FORMATS digital map  
 FGDC GEOSPATIAL PRESENTATION FORMAT vector digital data

COLLECTION TITLE GIS Fault Mapping of Virginia Seismic Zones

[Hide Citation ▲](#)

## Citation Contacts ►

RESPONSIBLE PARTY  
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 ORGANIZATION'S NAME Virginia Department of Mines, Minerals, and Energy  
 CONTACT'S POSITION Geologist  
 CONTACT'S ROLE originator

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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

STATUS completed  
 SPATIAL REPRESENTATION TYPE vector

\* PROCESSING ENVIRONMENT Microsoft Windows 7 Version 6.1 (Build 7601) Service Pack 1; Esri ArcGIS 10.2.2.3552

### CREDITS

This digital data is the result of a three-year project funded by the Federal Emergency Management Agency (FEMA) through the Virginia Department of Emergency Management (VDEM) and by the Virginia Department of Mines, Minerals, and Energy (VDMME) via Grant Agreement Number HMGP-DR-4042-000-014 for \$548,969. The primary authors are Anne C. Witt, Wendy S. Kelly, and Matthew J. Heller from VDMME - Division of Geology and Mineral Resources (DGMR).

Martin Chapman and Bill Henika of Virginia Tech and Chuck Bailey of the College of William and Mary served as consultants on this project and assisted with project design, the collection of earthquake and fault information, and the review of the final deliverable products. Mike Enomoto, Marques Hatfield, William Swanger, Marcie Occhi, and Aaron Cross of DGMR completed specific tasks for the project. Amy Howard of VDEM served as grant coordinator.

### ARCGIS ITEM PROPERTIES

\* NAME Seismic\_Zones  
 \* LOCATION file:///wdb01513  
 \dgm\PROJECTS\MAPPING\Earthquake\Final\_Deliverables\GIS\_Data\Planners\_Deliverables\Fault\_Geodatabase\_Planners.gdb  
 \* ACCESS PROTOCOL Local Area Network

[Hide Resource Details ▲](#)

**Extents ►**

## EXTENT

## DESCRIPTION

This dataset contains polygon data demarcating the boundaries of the three seismically active areas of Virginia.

## GEOGRAPHIC EXTENT

## BOUNDING RECTANGLE

EXTENT TYPE Extent used for searching

\* WEST LONGITUDE -83.773705

\* EAST LONGITUDE -77.203106

\* NORTH LATITUDE 38.132190

\* SOUTH LATITUDE 36.547883

\* EXTENT CONTAINS THE RESOURCE Yes

## TEMPORAL EXTENT

BEGINNING DATE 2013-03-01 00:00:00

ENDING DATE 2017-04-28 00:00:00

## EXTENT IN THE ITEM'S COORDINATE SYSTEM

\* WEST LONGITUDE 481371.392964

\* EAST LONGITUDE 2373091.602627

\* SOUTH LATITUDE 119724.201890

\* NORTH LATITUDE 654965.737376

\* EXTENT CONTAINS THE RESOURCE Yes

*Hide Extents ▲*

**Resource Points of Contact ►**

## POINT OF CONTACT

INDIVIDUAL'S NAME Anne Carter Witt

ORGANIZATION'S NAME Virginia Department of Mines, Minerals, and Energy

CONTACT'S POSITION Geologist

CONTACT'S ROLE point of contact

## CONTACT INFORMATION ►

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*Hide Contact information ▲*

*Hide Resource Points of Contact ▲*

**Resource Maintenance ►**

## RESOURCE MAINTENANCE

UPDATE FREQUENCY not planned

*Hide Resource Maintenance ▲*

**Resource Constraints ►**

## LEGAL CONSTRAINTS

## LIMITATIONS OF USE

All users of this electronic data set must read and fully comprehend the metadata prior to use. All electronic and/or hardcopy products (maps, data, and text, etc.) produced by the Virginia Department of Mines, Minerals and Energy - Division of Geology and Mineral Resources are considered public information (unless otherwise noted) and may be distributed or copied. When using, distributing or copying this data set as a source, the Originator must be acknowledged. These products are intended to serve for general planning purposes only and are provided on an "as is" basis. This data set shall not be used beyond the limits of the set source scale. This data set does not represent a survey document completed by a licensed land surveyor and should not be utilized as such.

## CONSTRAINTS

## LIMITATIONS OF USE

The boundaries of the seismic zones are diffuse and earthquakes will certainly occur outside of these boundaries. These seismic zones should not be used to identify or assess seismic hazard or risk. These boundaries identify where there has historically been a greater frequency of earthquakes based on the DGMR earthquake catalog.

[Hide Resource Constraints ▲](#)

## Spatial Reference ►

## ARCGIS COORDINATE SYSTEM

- \* TYPE Projected
- \* GEOGRAPHIC COORDINATE REFERENCE GCS\_North\_American\_1927
- \* PROJECTION NAD\_1927\_StatePlane\_Virginia\_South\_FIPS\_4502
- \* COORDINATE REFERENCE DETAILS
  - PROJECTED COORDINATE SYSTEM
    - WELL-KNOWN IDENTIFIER 32047
    - X ORIGIN -120618000
    - Y ORIGIN -94806700
    - XY SCALE 3048.0060960121928
    - Z ORIGIN -100000
    - Z SCALE 10000
    - M ORIGIN -100000
    - M SCALE 10000
    - XY TOLERANCE 0.0032808333333333331
    - Z TOLERANCE 0.001
    - M TOLERANCE 0.001
    - HIGH PRECISION true
    - LATEST WELL-KNOWN IDENTIFIER 32047
    - WELL-KNOWN TEXT PROJCS["NAD\_1927\_StatePlane\_Virginia\_South\_FIPS\_4502",GEOGCS["GCS\_North\_American\_1927",DATUM["D\_North\_American\_1927",SPHEROID["Clarke\_1866",6378206.4,294.9786982]],PRIMEM["Greenwich",0.0],UNIT["Degree",0.0174532925199433]],PROJECTION["Lambert\_Conformal\_Conic"],PARAMETER["False\_Easting",2000000.0],PARAMETER["False\_Northing",0.0],PARAMETER["Central\_Meridian",-78.5],PARAMETER["Standard\_Parallel\_1",36.76666666666667],PARAMETER["Standard\_Parallel\_2",37.96666666666667],PARAMETER["Latitude\_Of\_Origin",36.33333333333334],UNIT["Foot\_US",0.3048006096012192],AUTHORITY["EPSG",32047]]

## REFERENCE SYSTEM IDENTIFIER

- \* VALUE 32047
- \* CODESPACE EPSG
- \* VERSION 8.2.6

[Hide Spatial Reference ▲](#)

## Spatial Data Properties ►

## VECTOR ►

- \* LEVEL OF TOPOLOGY FOR THIS DATASET geometry only

## GEOMETRIC OBJECTS

- FEATURE CLASS NAME Seismic\_Zones
- \* OBJECT TYPE composite
- \* OBJECT COUNT 3

[Hide Vector ▲](#)

## ARCGIS FEATURE CLASS PROPERTIES ►

- FEATURE CLASS NAME Seismic\_Zones
- \* FEATURE TYPE Simple
- \* GEOMETRY TYPE Polygon
- \* HAS TOPOLOGY FALSE
- \* FEATURE COUNT 3
- \* SPATIAL INDEX TRUE
- \* LINEAR REFERENCING FALSE

[Hide ArcGIS Feature Class Properties ▲](#)

[Hide Spatial Data Properties ▲](#)

## Data Quality ►

DATA QUALITY REPORT - CONCEPTUAL CONSISTENCY ►

## MEASURE DESCRIPTION

The seismic zones are consistent based on the input epicenter information for Virginia and surrounding states. Future earthquakes will help better define these zones.

[Hide Data quality report - Conceptual consistency ▲](#)

## DATA QUALITY REPORT - COMPLETENESS OMISSION ►

## MEASURE DESCRIPTION

This dataset is complete based on the input epicenter locations and the derived density of earthquakes in Virginia.

[Hide Data quality report - Completeness omission ▲](#)

[Hide Data Quality ▲](#)

## Lineage ►

## PROCESS STEP ►

WHEN THE PROCESS OCCURRED 2014-01-01 00:00:00

## DESCRIPTION

Earthquake point locations (from the epicenter feature class) were entered into the Kernel Density Tool in the ArcGIS Spatial Analyst Toolbox. This tool determines how many features are identified within a determined search radius. The output is a raster file where each pixel is equal to the number of features (in this case epicenters) are found within the selected search radius (30 square miles). This raster was then symbolized using an 8-class Quantile Classification scheme, where each class has the same number of values. Since there are so few epicenters for the study area, this helped identify where there were greater concentrations of earthquake epicenters and thus define, generally, the boundaries of the seismic zones.

## PROCESS CONTACT

INDIVIDUAL'S NAME Anne Carter Witt  
 ORGANIZATION'S NAME Virginia Department of Mines, Minerals, and Energy  
 CONTACT'S POSITION Geologist  
 CONTACT'S ROLE originator

## CONTACT INFORMATION ►

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 ADMINISTRATIVE AREA VA  
 POSTAL CODE 22903  
 E-MAIL ADDRESS anne.witt@dmme.virginia.gov

[Hide Contact information ▲](#)

[Hide Process step ▲](#)

## PROCESS STEP ►

WHEN THE PROCESS OCCURRED 2014-01-02 00:00:00

## DESCRIPTION

The Kernel Density raster output was then converted to polygons where there was a medium-to-high ratio of epicenters per square mile.

## PROCESS CONTACT

INDIVIDUAL'S NAME Anne Carter Witt  
 ORGANIZATION'S NAME Virginia Department of Mines, Minerals, and Energy  
 CONTACT'S POSITION Geologist  
 CONTACT'S ROLE originator

## CONTACT INFORMATION ►

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[Hide Contact information ▲](#)

[Hide Process step ▲](#)

[Hide Lineage ▲](#)

## Distribution ►

### DISTRIBUTOR ►

#### CONTACT INFORMATION

INDIVIDUAL'S NAME Anne Carter Witt  
 ORGANIZATION'S NAME Virginia Department of Mines, Minerals, and Energy  
 CONTACT'S POSITION Geologist  
 CONTACT'S ROLE distributor

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[Hide Contact information ▲](#)

#### ORDERING PROCESS

TERMS AND FEES None  
 DATE OF AVAILABILITY 2017-03-31 00:00:00  
 INSTRUCTIONS  
 Data is available by internet download or by contacting the distributor directly.

[Hide Distributor ▲](#)

### DISTRIBUTION FORMAT

\* NAME File Geodatabase Feature Class

[Hide Distribution ▲](#)

## Fields ►

### DETAILS FOR OBJECT [Seismic\\_Zones](#) ►

\* TYPE Feature Class  
 \* ROW COUNT 3  
 DEFINITION  
 Areas of greater earthquake frequency.

#### DEFINITION SOURCE

DMME

### 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.

*Hide Field OBJECTID ▲*

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.

*Hide Field SHAPE ▲*

FIELD Name ►  
 \* ALIAS Name  
 \* DATA TYPE String  
 \* WIDTH 50  
 \* PRECISION 0  
 \* SCALE 0  
 FIELD DESCRIPTION  
 The name of the seismic zone.

DESCRIPTION SOURCE  
 DMME

DESCRIPTION OF VALUES  
 The name of the seismic zone.

*Hide Field Name ▲*

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.

*Hide Field SHAPE\_Length ▲*

**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.

[Hide Field Shape\\_Area ▲](#)[Hide Details for object Seismic\\_Zones ▲](#)[Hide Fields ▲](#)**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 2017-05-23

**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 2017-04-26 15:24:16  
 LAST MODIFIED IN ARCGIS FOR THE ITEM 2017-05-23 15:29:44

**AUTOMATIC UPDATES**

HAVE BEEN PERFORMED Yes  
 LAST UPDATE 2017-05-23 15:29:44

[Hide Metadata Details ▲](#)**Metadata Contacts ▶****METADATA CONTACT**

INDIVIDUAL'S NAME Anne Carter Witt  
 ORGANIZATION'S NAME Virginia Department of Mines, Minerals, and Energy  
 CONTACT'S POSITION Geologist  
 CONTACT'S ROLE point of contact

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[Hide Contact information ▲](#)



[Hide Metadata Contacts ▲](#)

## Metadata Maintenance ►

### MAINTENANCE

UPDATE FREQUENCY not planned

### MAINTENANCE CONTACT

INDIVIDUAL'S NAME Anne Carter Witt

ORGANIZATION'S NAME Virginia Department of Mines, Minerals, and Energy

CONTACT'S POSITION Geologist

CONTACT'S ROLE originator

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[Hide Contact information ▲](#)[Hide Metadata Maintenance ▲](#)

## Thumbnail and Enclosures ►

### THUMBNAIL

THUMBNAIL TYPE JPG

[Hide Thumbnail and Enclosures ▲](#)

## FGDC Metadata (read-only) ▼