

Seismic Hazard



Tags

Seismic Hazard, Earthquake, USGS

Identification_Information:

Citation:

Citation_Information:

Originator: Rukstales, Kenneth S. (compiler)

Publication_Date: 201201

Title: Seismic Hazard Map for the United States

Geospatial_Data_Presentation_Form: Map

Publication_Information:

Publication_Place: Reston, VA

Publisher: National Atlas of the United States

Online_Linkage: <<http://nationalatlas.gov/atlasftp.html?openChapters=chpgeol#chpgeol>>

Description:

Abstract:

This map layer shows seismic hazard in the United States. The data represent a model showing the probability that ground motion will reach a certain level. This map layer shows peak horizontal ground acceleration (the fastest measured change in speed, for a particle at ground level that is moving horizontally due to an earthquake) with a 10% probability of exceedance in 50 years. Values are given in %g, where g is acceleration due to gravity, or 9.8 meters/second². The lines of equal hazard, which are the lines between the polygons, were determined by interpolating from a grid of equally spaced points in latitude and longitude. Each point was weighted based on the seismic hazard at that location. The grid spacing is 0.1 degrees for Alaska, 0.05 degrees for the conterminous United States, and 0.02 degrees for Hawaii.

Purpose:

This map summarizes the quantitative information, available from geologic and geophysical sources, about seismic ground motion hazard in the United States. The data are intended for geographic display and analysis at the national level, and for large regional areas. The data should be displayed and analyzed at scales appropriate for 1:2,000,000-scale data.

No responsibility is assumed by the U.S. Geological Survey or the National Atlas of the United States in the use of these data.

Supplemental Information:

This map layer was prepared by combining spatially-smoothed historic seismicity information with information from fault-specific sources. The acceleration values contoured are the random horizontal component. The reference site condition is firm rock, defined as having an average shear-wave velocity of 760 meters/second in the top 30 meters corresponding to the boundary between National Earthquake Hazards Reduction Program (NEHRP) site classes B and C.

For more information about the USGS National Seismic Hazard Maps, please visit <<http://earthquake.usgs.gov/hazards/index.php>>.

A description of how the underlying geologic and geophysical data were prepared as well as the methodology used in calculating seismic hazard for a geographic location can be found in the following reports:

Petersen, M.D., Frankel, A.D., Harmsen, S.C., Mueller, C.S., Haller, K.M., Wheeler, R.L., Wesson, R.L., Zeng, Yuehua, Boyd, O.S., Perkins, D.M., Luco, Nicolas, Field, E.H., Wills, C.J., and Rukstales, K.S., 2008, Documentation for the 2008 Update of the United States National Seismic Hazard Maps: U.S. Geological Survey Open-File Report 2008-1128, 61 p.

Klein, F.W., A.D. Frankel, C.S. Mueller, R.L. Wesson and P.G. Okubo, 2001, Seismic Hazard in Hawaii: high rate of large earthquakes and probabilistic ground motion maps, Bulletin of the Seismological Society of America, v. 91, pp. 479-498.

Wesson, Robert L., Boyd, Oliver S., Mueller, Charles S., Bufe, Charles G., Frankel, Arthur D., Petersen, Mark D., 2007, Revision of time-Independent probabilistic seismic hazard maps for Alaska: U.S. Geological Survey Open-File Report 2007-1043, 33p.

Time_Period_of_Content:
Time_Period_Information:
Single_Date/Time:
Calendar_Date: 2012
Currentness_Reference: Publication date

Status:
Progress: Complete
Maintenance_and_Update_Frequency: As Needed

Spatial_Domain:
Bounding_Coordinates:
West_Bounding_Coordinate: 172
East_Bounding_Coordinate: -66
North_Bounding_Coordinate: 72
South_Bounding_Coordinate: 18

Keywords:
Theme:
Theme_Keyword_Thesaurus: ISO 19115 Topic Category
Theme_Keyword: geoscientificInformation
Theme:
Theme_Keyword_Thesaurus: None
Theme_Keyword: Seismic
Theme_Keyword: Earthquakes
Theme_Keyword: Hazards

Place:
Place_Keyword_Thesaurus: None
Place_Keyword: Alabama
Place_Keyword: Alaska
Place_Keyword: Arizona
Place_Keyword: Arkansas
Place_Keyword: California
Place_Keyword: Colorado
Place_Keyword: Connecticut
Place_Keyword: Delaware
Place_Keyword: District of Columbia
Place_Keyword: Florida
Place_Keyword: Georgia
Place_Keyword: Hawaii

Place_Keyword: Idaho
Place_Keyword: Illinois
Place_Keyword: Indiana
Place_Keyword: Iowa
Place_Keyword: Kansas
Place_Keyword: Kentucky
Place_Keyword: Louisiana
Place_Keyword: Maine
Place_Keyword: Maryland
Place_Keyword: Massachusetts
Place_Keyword: Michigan
Place_Keyword: Minnesota
Place_Keyword: Mississippi
Place_Keyword: Missouri
Place_Keyword: Montana
Place_Keyword: Nebraska
Place_Keyword: Nevada
Place_Keyword: New Hampshire
Place_Keyword: New Jersey
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Place_Keyword: New York
Place_Keyword: North Carolina
Place_Keyword: North Dakota
Place_Keyword: Ohio
Place_Keyword: Oklahoma
Place_Keyword: Oregon
Place_Keyword: Pennsylvania
Place_Keyword: Rhode Island
Place_Keyword: South Carolina
Place_Keyword: South Dakota
Place_Keyword: Tennessee
Place_Keyword: Texas
Place_Keyword: Utah
Place_Keyword: Vermont
Place_Keyword: Virginia
Place_Keyword: Washington
Place_Keyword: West Virginia
Place_Keyword: Wisconsin
Place_Keyword: Wyoming
Place_Keyword: USA

Access_Constraints: None.

Use_Constraints:

Acknowledgment of the National Atlas of the United States of America and (or) the U.S. Geological Survey, National Seismic Hazard Mapping Project would be appreciated in products derived from these data.

Point_of_Contact:

Contact_Information:

Contact_Person_Primary:

Contact_Person: Ken Rukstales

Contact_Organization: U.S. Geological Survey

Contact_Address: Address_Type:

Mailing address Address: Box

25046, Mail Stop 966

City: Denver

State_or_Province: CO

Postal_Code: 80225

Country: USA

Contact_Voice_Telephone: 303-273-8677

Contact_Facsimile_Telephone: 303-273-8600

Contact_Electronic_Mail_Address: rukstales@usgs.gov

Contact_Instructions: Please contact via e-mail or telephone

Native_Data_Set_Environment:

Windows XP

ArcGIS version 10

Cross_Reference:

Citation_Information:

Originator: M. Petersen

Originator: A. Frankel

Originator: S. Harmsen

Originator: C. Mueller

Originator: K. Haller

Originator: R. Wheeler

Originator: R. Wesson

Originator: Y. Zeng

Originator: O. Boyd

Originator: D. Perkins

Originator: N. Luco

Originator: E. Field

Originator: C. Wills

Originator: K. Rukstales

Publication_Date: 2011

Title: Seismic-Hazard Maps for the Conterminous United States, 2008

Geospatial_Data_Presentation_Form: Map

Series_Information:

Series_Name: U.S. Geological Survey Scientific Investigations Map

Issue_Identification: 3195

Publication_Information:

Publication_Place: Reston, VA

Publisher: U.S. Geological Survey

Other_Citation_Details: 6 sheets, scale 1:7,000,000

Cross_Reference:

Citation_Information:

Originator: F.W. Klein

Originator: A.D. Frankel

Originator: C.S. Mueller

Originator: R.L. Wesson

Originator: P.G. Okubo

Publication_Date: 2000

Title: Seismic-Hazard Maps for Hawaii

Geospatial_Data_Presentation_Form: Map

Series_Information:

Series_Name: U.S. Geological Survey Geologic Investigations Series Map

Issue_Identification: I-2724

Publication_Information:

Publication_Place: Reston, VA

Publisher: U.S. Geological Survey

Other_Citation_Details: 2 sheets, scale 1:2,000,000

Data_Quality_Information:

Attribute_Accuracy:

Attribute_Accuracy_Report:

This map layer is based on a theoretical model. The following resources provide information on quality assessment for the map layer:

Petersen, M., A. Frankel, S. Harmsen, C. Mueller, K. Haller, R. Wheeler, R. Wesson, Y. Zeng, O. Boyd, D. Perkins, N. Luco, E. Field, C. Wills and K. Rukstales, 2008, Documentation for the 2008 Update of the United States National Seismic-Hazard Maps: U.S. Geological Survey Open-File Report 2008-1128, 61 p.

Klein, F.W., A.D. Frankel, C.S. Mueller, R.L. Wesson and P.G. Okubo, 2001, Seismic Hazard in Hawaii: high rate of large earthquakes and probabilistic ground motion maps, Bulletin of the Seismological Society of America, v. 91, pp. 479-498.

Wesson, Robert L., Boyd, Oliver S., Mueller, Charles S., Bufe, Charles G., Frankel, Arthur D., Petersen, Mark D., 2007, Revision of time-Independent probabilistic seismic hazard maps for Alaska: U.S. Geological Survey

Open-File Report 2007-1043, 33p.

Logical_Consistency_Report:

Polygon and chain-node topology are present.

Uncertainty in the underlying seismicity or fault parameters was not considered in the production of this map layer.

Completeness_Report: This map layer shows levels of seismic hazard for the United States.

Positional_Accuracy:

Horizontal_Positional_Accuracy:

Horizontal_Positional_Accuracy_Report:

The location of features is based on theoretical calculations of a seismological model for the study area. The location of each point is considered to be correct within the confines of computer accuracy.

Lineage:

Source_Information:

Source_Citation:

Citation_Information:

Originator: M. Petersen

Originator: A. Frankel

Originator: S. Harmsen

Originator: C. Mueller

Originator: K. Haller

Originator: R. Wheeler

Originator: R. Wesson

Originator: Y. Zeng

Originator: O. Boyd

Originator: D. Perkins

Originator: N. Luco

Originator: E. Field

Originator: C. Wills

Originator: K. Rukstales

Publication_Date: 2011

Title: Seismic-Hazard Maps for the Conterminous United States, 2008

Geospatial_Data_Presentation_Form: Map

Series_Information:

Series_Name: U.S. Geological Survey Scientific Investigations Map

Issue_Identification: 3195

Publication_Information:

Publication_Place: Reston, VA

Publisher: U.S. Geological Survey

Other_Citation_Details: 6 sheets

Source_Scale_Denominator: 7000000

Type_of_Source_Media: Paper

Source_Time_Period_of_Content:

Time_Period_Information:

Single_Date/Time:

Calendar_Date: 2011

Source_Currentness_Reference: Publication date

Source_Citation_Abbreviation: SH-USA

Source_Contribution:

The publication describes the conterminous United States historical seismicity and fault-specific sources used to build the theoretical model, as well as the methodology employed.

Source_Information:

Source_Citation:

Citation_Information:

Originator: F.W. Klein

Originator: A.D. Frankel

Originator: C.S. Mueller

Originator: R.L. Wesson

Originator: P.G. Okubo

Publication_Date: 2000

Title: Seismic-Hazard Maps for Hawaii

Geospatial_Data_Presentation_Form: Map

Series_Information:

Series_Name: U.S. Geological Survey Geologic Investigations Series Map

Issue_Identification: I-2724

Publication_Information:

Publication_Place: Reston, VA

Publisher: U.S. Geological Survey

Other_Citation_Details: 2 sheets

Source_Scale_Denominator: 2000000

Type_of_Source_Media: Paper

Source_Time_Period_of_Content:

Time_Period_Information:

Single_Date/Time:

Calendar_Date: 2000

Source_Currentness_Reference: Publication date

Source_Citation_Abbreviation: SH-Hawaii

Source_Contribution:

The publication describes the Hawaiian historical seismicity and fault specific sources used to build the theoretical model, as well as the methodology employed.

Process_Step:

Process_Description:

Information drawn from the sources was used to produce an ASCII file of grid points having a latitude and longitude spacing of 0.1 degrees (Alaska), 0.05 degrees (conterminous United States), or 0.02 degrees (Hawaii). For each grid point an associated acceleration value, or weight, was calculated from the historic seismicity and fault-specific sources, according to the prescribed seismological model. The data were then contoured using ArcGIS. The desired final lines of equal seismological hazard were selected and polygon and arc topology were ascertained as well as appropriate feature attributes. The file was converted to Shapefile format.

Process_Date: 2012

Process_Contact:

Contact_Information:

Contact_Person_Primary:

Contact_Person: Ken Rukstales

Contact_Organization: U.S. Geological Survey

Contact_Address: Address_Type:

Mailing address Address: Box

25046, Mail Stop 966

City: Denver

State_or_Province: Colorado

Postal_Code: 80225

Country: USA

Contact_Voice_Telephone: 303-273-8677

Contact_Facsimile_Telephone: 303-273-8600

Contact_Electronic_Mail_Address: rukstales@usgs.gov

Contact_Instructions: Please contact via e-mail or telephone

Spatial_Data_Organization_Information:

Direct_Spatial_Reference_Method: Vector

Point_and_Vector_Object_Information:

SDTS_Terms_Description:

SDTS_Point_and_Vector_Object_Type: GT-polygon composed of chains

Point_and_Vector_Object_Count: 3647

Spatial_Reference_Information:

Horizontal_Coordinate_System_Definition:

Geographic:

Latitude_Resolution: 0.000278

Longitude_Resolution: 0.000278

Geographic_Coordinate_Units: Decimal degrees

Geodetic_Model:

Horizontal_Datum_Name: North American Datum of 1983

Ellipsoid_Name: GRS1980

Semi-major_Axis: 6378137.0
Denominator_of_Flattening_Ratio: 298.257222

Entity_and_Attribute_Information:

Detailed_Description:

Entity_Type:

Entity_Type_Label: Areas of seismic hazard (described by seihazp020.dbf).

Entity_Type_Definition:

Areas of predicted peak horizontal ground acceleration within the specified range, with a 10% probability of exceedance in 50 years.

Entity_Type_Definition_Source: U.S. Geological Survey

Attribute:

Attribute_Label: FID

Attribute_Definition: Internal feature number.

Attribute_Definition_Source: ESRI

Attribute_Domain_Values:

Unrepresentable_Domain: Sequential unique whole numbers that are automatically generated.

Attribute:

Attribute_Label: Shape

Attribute_Definition: The representation of the entity in the data.

Attribute_Definition_Source: National Atlas of the United States

Attribute_Domain_Values:

Enumerated_Domain: Enumerated_Domain_Value: Polygon

Enumerated_Domain_Value_Definition: 2-dimensional element

Enumerated_Domain_Value_Definition_Source: ESRI GIS software

Attribute:

Attribute_Label: Valley

Attribute_Definition: A code indicating whether the polygon represents a local minima.

Attribute_Definition_Source: U.S. Geological Survey

Attribute_Domain_Values:

Enumerated_Domain:

Enumerated_Domain_Value: 0

Enumerated_Domain_Value_Definition: The polygon is not a local minima.

Enumerated_Domain_Value_Definition_Source: U.S. Geological Survey

Attribute_Domain_Values:

Enumerated_Domain:

Enumerated_Domain_Value: 1

Enumerated_Domain_Value_Definition: The polygon is a local minima.

Enumerated_Domain_Value_Definition_Source: U.S. Geological Survey

Attribute:

Attribute_Label: ACC_VAL

Attribute_Definition: The minimum peak horizontal acceleration value for the polygon, %g.

Attribute_Definition_Source: USGS

Attribute_Domain_Values:

Enumerated_Domain:

Enumerated_Domain_Value: 0 - 1

Enumerated_Domain_Value_Definition: Acceleration values within the polygon range from 0% to 1% g

Enumerated_Domain_Value_Definition_Source: USGS

Enumerated_Domain:

Enumerated_Domain_Value: 1 - 2

Enumerated_Domain_Value_Definition: Acceleration values within the polygon range from 1% to 2% g

Enumerated_Domain_Value_Definition_Source: USGS

Enumerated_Domain:

Enumerated_Domain_Value: 2 - 3

Enumerated_Domain_Value_Definition: Acceleration values within the polygon range from 2% to 3% g

Enumerated_Domain_Value_Definition_Source: USGS

Enumerated_Domain:

Enumerated_Domain_Value: 3 - 4

Enumerated_Domain_Value_Definition: Acceleration values within the polygon range from 3% to 4% g

Enumerated_Domain_Value_Definition_Source: USGS

Enumerated_Domain:

Enumerated_Domain_Value: 4 - 5

Enumerated_Domain_Value_Definition: Acceleration values within the polygon range from 4% to 5% g

Enumerated_Domain_Value_Definition_Source: USGS

Enumerated_Domain:

Enumerated_Domain_Value: 5 - 6

Enumerated_Domain_Value_Definition: Acceleration values within the polygon range from 5% to 6% g

Enumerated_Domain_Value_Definition_Source: USGS

Enumerated_Domain:

Enumerated_Domain_Value: 6 - 7

Enumerated_Domain_Value_Definition: Acceleration values within the polygon range from 6% to 7% g

Enumerated_Domain_Value_Definition_Source: USGS

Enumerated_Domain:

Enumerated_Domain_Value: 7 - 8

Enumerated_Domain_Value_Definition: Acceleration values within the polygon range from 7% to 8% g

Enumerated_Domain_Value_Definition_Source: USGS

Enumerated_Domain:

Enumerated_Domain_Value: 8 - 9

Enumerated_Domain_Value_Definition: Acceleration values within the polygon range from 8% to 9% g

Enumerated_Domain_Value_Definition_Source: USGS

Enumerated_Domain:

Enumerated_Domain_Value: 9 - 10

Enumerated_Domain_Value_Definition: Acceleration values within the polygon range from 9% to 10%

g

Enumerated_Domain_Value_Definition_Source: USGS

Enumerated_Domain:

Enumerated_Domain_Value: 10 - 15

Enumerated_Domain_Value_Definition: Acceleration values within the polygon range from 10% to

15% g

Enumerated_Domain_Value_Definition_Source: USGS

Enumerated_Domain:

Enumerated_Domain_Value: 15 - 20

Enumerated_Domain_Value_Definition: Acceleration values within the polygon range from 15% to

20% g

Enumerated_Domain_Value_Definition_Source: USGS

Enumerated_Domain:

Enumerated_Domain_Value: 20 - 25

Enumerated_Domain_Value_Definition: Acceleration values within the polygon range from 20% to

25% g

Enumerated_Domain_Value_Definition_Source: USGS

Enumerated_Domain:

Enumerated_Domain_Value: 25 - 30

Enumerated_Domain_Value_Definition: Acceleration values within the polygon range from 25% to

30% g

Enumerated_Domain_Value_Definition_Source: USGS

Enumerated_Domain:

Enumerated_Domain_Value: 30 - 40

Enumerated_Domain_Value_Definition: Acceleration values within the polygon range from 30% to

40% g

Enumerated_Domain_Value_Definition_Source: USGS

Enumerated_Domain:

Enumerated_Domain_Value: 40 - 60

Enumerated_Domain_Value_Definition: Acceleration values within the polygon range from 40% to

60% g

Enumerated_Domain_Value_Definition_Source: USGS

Enumerated_Domain:

Enumerated_Domain_Value: 60 - 80

Enumerated_Domain_Value_Definition: Acceleration values within the polygon range from 60% to

80% g

Enumerated_Domain_Value_Definition_Source: USGS

Enumerated_Domain:

Enumerated_Domain_Value: 80 - 100

Enumerated_Domain_Value_Definition: Acceleration values within the polygon range from 80% to

100% g

Enumerated_Domain_Value_Definition_Source: USGS

Enumerated_Domain:

Enumerated_Domain_Value: > 100

Enumerated_Domain_Value_Definition: Acceleration values within the polygon have values \geq 100% g

Enumerated_Domain_Value_Definition_Source: USGS

Distribution_Information:

Distributor:

Contact_Information:

Contact_Organization_Primary:

Contact_Organization: Earth Science Information Center, U.S. Geological Survey

Contact_Address:

Address_Type: Mailing address

Address: 507 National Center

City: Reston

State_or_Province: VA

Postal_Code: 20192

Contact_Voice_Telephone: 1-888-ASK-USGS (1-888-275-8747)

Contact_Voice_Telephone: 703-648-5920

Contact_Instructions:

In addition to the address above there are other ESIC offices throughout the country. A full list of these offices is at

<http://ask.usgs.gov/esic_index.html>.

Distribution_Liability:

Although these data have been processed successfully on a computer system at the U.S. Geological Survey, no warranty expressed or implied is made by the U.S. Geological Survey regarding the utility of the data on any other system, nor shall the act of distribution constitute any such warranty.

No responsibility is assumed by the U.S. Geological Survey in the use of these data.

Standard_Order_Process:

Digital_Form:

Digital_Transfer_Information:

Format_Name: ESRI Shapefile

Digital_Transfer_Option:

Online_Option:

Computer_Contact_Information:

Network_Address:

Network_Resource_Name: <<http://nationalatlas.gov/atlasftp.html?openChapters=chpgeol#chpgeol>>

Digital_Form:

Digital_Transfer_Information:

Format_Name: SDTS

Digital_Transfer_Option:

Online_Option:

Computer_Contact_Information:

Network_Address:

Network_Resource_Name: <<http://nationalatlas.gov/atlasftp.html?openChapters=chpgeol#chpgeol>>

Fees: There is no charge for the map layer.

Metadata_Reference_Information:

Metadata_Date: 20120118

Metadata_Contact:

Contact_Information:

Contact_Person_Primary:

Contact_Person: Peg Rawson

Contact_Organization: National Atlas of the United States

Contact_Address: Address_Type:

Mailing address Address: 12201

Sunrise Valley Dr Address: MS

561

City: Reston

State_or_Province: VA

Postal_Code: 20192

Country: USA

Contact_Voice_Telephone: 703-648-4183

Contact_Electronic_Mail_Address: atlasmail@usgs.gov

Metadata_Standard_Name: FGDC Content Standards for Digital Geospatial Metadata

Metadata_Standard_Version: FGDC-STD-001-1998

Metadata_Security_Information:

Metadata_Security_Classification_System: None

Metadata_Security_Classification: Unclassified

Metadata_Security_Handling_Description: None