AmericanLifelinesAlliance

A public-private partnership to reduce risk to utility and transportation systems from natural hazards and manmade threats

Guideline for Assessing the Performance of Electric Power Systems in Natural Hazard and Human Threat Events

Part 2 – Commentary

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Acknowledgments

Although many of the procedures presented here have been validated through experience and practice, this is the first time a pragmatic approach has been developed to assess *system performance.* The *Guideline and Commentary for Assessing the Performance of Electric Power Systems* was developed by a team of experts in engineering and risk analysis, led by ImageCat, Inc. of Long Beach, California. A group of practicing engineers, academics, and industry personnel reviewed drafts of the document to provide industry input and an American Lifelines Alliance (ALA) oversight committee monitored the guideline and commentary development work to ensure compliance with ALA project goals.

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1.0 Introduction

This commentary contains supplementary information supporting the development and implementation of this guideline (Guideline for Assessing the Performance of Electric Power Systems in Natural Hazard and Human Threat Events). While not integral to the implementation of the guideline, this information is useful for understanding the methods, procedures, and practices that are referenced in the approach and the data needed to screen out certain hazards and/or areas from detailed investigations.

For purposes of reference, this commentary is intended to address all key components of electric power systems: transmission substations, transmission lines, transmission and communication towers and distribution poles, distribution substations, distribution lines, distribution service transformers, low voltage control, protection and communications systems (e.g., SCADA), office buildings, maintenance buildings, and operations buildings and their equipment.

1.1 Contents

This commentary is made up of six major sections:

- Recommended methods of analysis for performing hazard, component vulnerability, and system performance assessments; see Section 2.5 of this guideline **(Section 2)**,
- A description of the methodology and data used to determine hazard level criteria for this guideline; see Table 4-1 in this guideline **(Section 3)**,
- Annotated references **(Section 4),**
- Acronyms for key terms used in this guideline and commentary **(Section 5)**,
- Terms and definitions **(Section 6)**, and
- Hazard level tables for the U.S**. (Appendix A)**.

Each of these sections is self-contained; no attempt has been made to integrate these discussions into a standalone report. The main purpose of this commentary is to support the implementation of this guideline.

1.2 Limitations and Qualifications

The studies, examples, reports, maps, and references provided in this commentary are believed to be state-of-the-practice, at the time of this writing. As with most guidance material, advances are expected to occur in technology and knowledge that will require this material to be reassessed for appropriateness. As such, this "living" document will require updating over time.

While the materials in this commentary were developed with U.S. utilities in mind, much of the material is applicable worldwide (with the exception of the hazard maps in this commentary and hazard tables in Appendix A), especially the methods of analysis that are introduced in Section 2.

2.0 Methods of Analysis

This section describes methods to quantify hazard potential and severity, power equipment fragility or vulnerability, and system performance. Methods of analysis were introduced in Section 2.5 of the guideline. Whereas, Tables 5-4 through 5-9 in the guideline recommend tasks for each analysis, the tables contained in this section (Tables 2-1 through 2-11) identify current procedures and practices that have been used to carry out these analyses in past projects. The tables include comments that discuss the advantages and disadvantages of each method, when each method may be most applicable, and pertinent resource documents describing the methodology. The tables include a determination of analysis level according to Levels 1, 2 or 3. This information is useful in achieving consistency of methods with respect to the level assignments provided in this guideline by offering methods of varying detail and sophistication.
This section begins with a discussion of methods to assess natural hazards and human threats, proceeds to analysis methods for assessing equipment and building/equipment vulnerabilities, and ends with a presentation of methods for assessing system performance.

2.1 Natural Hazard Assessment

Natural hazards covered in this study include: a) earthquakes, including surface fault rupture, liquefaction and ground-shaking effects, b) permanent ground movement hazards (non-earthquake induced), including landslides, frost heave, and settlement, c) windstorms, including severe wind, hurricane wind, and tornado, d) icing, and e) floods (including riverine and storm surge). Natural hazards not covered include wildfire, lightning, geomagnetic/solar effects, wildlife, and vegetation.

In general, most of the hazards can be addressed on a regional basis. For example, earthquake, windstorms, hurricane wind and storm surge, tornado, icing, and flooding hazards have all been mapped, largely for the entire contiguous U.S. Other hazards, such as settlement and some ground failure hazards caused by earthquake (liquefaction), are generally mapped for local areas; that is, no national maps are available to characterize the frequency or severity of these effects. Where available for local areas, these maps or databases are identified in the tables that follow.

2.1.1 General Description of Methods

The three methods used to quantify the occurrence and severity of natural hazards are:

- **Expert opinion** methods provide estimates based on previous work of experts in the region of interest or in regions of similar natural hazards characteristics. The expert performs few or no calculations and submits minimal documentation (e.g., a letter report). This approach is useful when published data are not available and when site-specific investigations are too expensive.

- **Published data/information** are estimates based on relevant data and/or information obtained from credible publications or websites, such as those produced by the U.S. Geological Survey, state geological surveys (e.g., California), national weather

services, or universities. Data can be obtained quickly, and the results are usually accurate. Regional studies may overlook or not address local hazards.

- **Site-specific studies** are most accurate and will, in many cases, include probabilistic assessments of the hazard. These methods can be costly and may require longer time frames to complete. For critical projects or assessments, this is usually the preferred method of analysis.

2.1.2 Methods to Assess Natural Hazards

Tables 2-1 through 2-5 list current procedures and practices for assessing earthquake hazards (ground motion, fault rupture, landslide, lurching, liquefaction, lateral spreading, settlement, tsunami and seiche), ground movement hazards/non-earthquake geohazards (gravity landslide, expansive soil, soil collapse, and frost heave), wind hazards (windstorm, tornado, and hurricane), icing, and flooding (riverine and storm surge), respectively.

Table 2-1. List of Current Procedures and Practices for Quantifying Earthquake Hazards

EARTHQUAKE HAZARD	PROCEDURES AND PRACTICES	DESCRIPTION OF METHOD USED TO QUANTIFY LIKELIHOOD OF HAZARD	PROS	CONS	WHEN APPLICABLE	RESOURCE DOCUMENTS DESCRIBING METHODOLOGY
Ground Motion	**Expert Opinions– Level 1**	Estimates based on previous work of expert in region of interest or in regions of similar seismic characteristics. Expert performs few or no calculations and submits minimal documentation, such as a letter report.	Estimates can be quite accurate depending on qualifications and relevant experience of expert.	Approach is generally more time consuming and expensive than approaches using published information.	When published data are not available and site-specific approaches are too expensive.	Not applicable
	Published Data/Information– Level 2	Relevant ground-motion data obtained from credible publications or websites, such as those produced by the U.S. Geological Survey, state geological surveys (e.g., California), earthquake engineering centers or organizations (e.g., Southern California Earthquake Center-SCEC), or universities.	Data can be obtained quickly and are usually accurate.	Studies are usually regional and may overlook local faults, seismic sources, or ground conditions that may be important. Many of the regional studies estimate ground motions for assumed local geology (e.g., bedrock), which may not be appropriate for site(s) of interest.	When cost or time considerations prohibit site-specific studies.	USGS 1997b; Frankel et al. 2000; USGS 2002; and the USGS website, http://eqhazmaps.usgs.gov/, provide rock-site ground-motion seismic hazard data for the U.S.
	Site-Specific– Level 3	Ground-motion hazard computed for site or sites using established probabilistic seismic hazard analysis (PSHA) methods.	Method is most accurate and robust. Current information on regional seismic sources and local geology can be easily incorporated.	Implementation of method is more expensive and time consuming than other two approaches.	When cost and time considerations are not excessively restrictive. Method is more appropriate for large systems affecting major population centers in seismic areas or for systems that would have adverse consequences, if incapacitated.	Cornell 1968 provides basic methodology.

Table 2-1. List of Current Procedures and Practices for Quantifying Earthquake Hazards (continued)

EARTHQUAKE HAZARD	PROCEDURES AND PRACTICES	DESCRIPTION OF METHOD USED TO QUANTIFY LIKELIHOOD OF HAZARD	PROS	CONS	WHEN APPLICABLE	RESOURCE DOCUMENTS DESCRIBING METHODOLOGY
Fault Rupture	**Expert Opinions– Level 1**	Estimates based on previous work of expert in region of interest or in regions of similar seismic characteristics. Expert performs few or no calculations and submits minimal documentation, such as a letter report.	Estimates can be quite accurate depending on qualifications and relevant experience of expert.	Approach is generally more time consuming and expensive than approaches using published information.	When published data are not available and site-specific approaches are too expensive.	Not applicable
	Published Data/Information– Level 2	Maps of potentially active faults can be obtained for some western states (e.g., CA, OR, WA, NV, UT, AZ) from primarily the state geological surveys, but publications describing the fault-rupture displacement hazard are more difficult to find, are unavailable, or do not exist.	Fault maps are relatively easy to obtain and at reasonable cost.	Data or information on fault displacements is difficult if not impossible to obtain from the literature.	When location of active fault is of primarily interest or when cost and time constraints prohibit site-specific study.	Not applicable. Fault maps, if available, can usually be obtained from the appropriate state agency.
	Site-Specific– Level 3	Office-based studies and sometimes field investigation are required to estimate fault-rupture hazard.	Approach is only available method in most cases to accurately estimate fault-rupture hazard.	Approach can be time consuming and expensive.	When key components are located in known or suspected active fault zones and estimates of the rupture hazard are required for reliability assessments.	Formal methodology described in Youngs et al. 2003; McCalpin 1996; Nyman et al. 2003.

Table 2-1. List of Current Procedures and Practices for Quantifying Earthquake Hazards (continued)

EARTHQUAKE HAZARD	PROCEDURES AND PRACTICES	DESCRIPTION OF METHOD USED TO QUANTIFY LIKELIHOOD OF HAZARD	PROS	CONS	WHEN APPLICABLE	RESOURCE DOCUMENTS DESCRIBING METHODOLOGY
Ground Failure (landslide, lurching, liquefaction, lateral spreading, settlement)	**Expert Opinions–Level 1**	Estimates based on previous work of expert in region of interest or in regions of similar seismic characteristics. Expert performs few or no calculations and submits minimal documentation, such as a letter report.	Estimates can be quite accurate depending on qualifications and relevant experience of expert.	Approach is generally more time consuming and expensive than approaches using published information.	When published data are not available and site-specific approaches are too expensive.	Not applicable
	Published Data/Information–Level 2	Maps of potential liquefaction and landslide areas are available for some locations, but landslide-prone areas are not confined to seismic regions.	Maps are easy to obtain.	Information on the permanent ground displacement hazard, which is of primary importance, typically is not available or does not exist. Maps of potential hazard exist for relatively few locations. Conservatism is often built into such maps.	When location of ground-failure hazard is of primary interest or when cost and time constraints prohibit site-specific study.	▪ Available liquefaction maps are listed in Power and Holzer 1996; California Geological Survey (www.consrv.ca.gov/cgs) ▪ Information on available landslide maps for California, for example, can be found on website http://www.consrv.ca.gov/cgs/rghm/landslides/ls_index.htm. ▪ Various websites contain information for obtaining maps for liquefaction and landslide hazards; these websites can be accessed through key word searches.
	Site-Specific–Level 3	Methods have been developed to estimate (1) probability of liquefaction or landslide at given locations and (2) annual probability of permanent ground displacement due to liquefaction or landslides.	Only available procedure when published information is not available.	Methods are generally difficult to apply and few professionals have developed and implemented methods. Methods can be expensive and time consuming.	When data are necessary for reliability assessments.	▪ Methods for computing probability of liquefaction can be found in National Research Council 1985, p. 174–89 and MCEER 1999. ▪ Method for probabilistic treatment of landslides with application can be found in USGS Open-File Report 98-113 (USGS 1998).

Table 2-1. List of Current Procedures and Practices for Quantifying Earthquake Hazards (continued)

EARTHQUAKE HAZARD	PROCEDURES AND PRACTICES	DESCRIPTION OF METHOD USED TO QUANTIFY LIKELIHOOD OF HAZARD	PROS	CONS	WHEN APPLICABLE	RESOURCE DOCUMENTS DESCRIBING METHODOLOGY
Inundation (Tsunami & Seiche)	**Expert Opinions– Level 1**	Estimates based on previous work of expert in region of interest or in regions of similar seismic characteristics. Expert performs few or no calculations and submits minimal documentation, such as a letter report.	Estimates can be quite accurate depending on qualifications and relevant experience of expert.	Approach is generally more time consuming and expensive than approaches using published information.	When published data are not available and site-specific approaches are too expensive.	Not applicable
	Published Data/Information– Level 2	Maps of tsunami hazard and tide gauge records can be obtained for the West Coast of the continental U.S. and Hawaii, where the hazard is greatest.	Tsunami hazard maps are relatively easy to obtain.	Maps may not reflect local conditions at a particular coastal site. Seiche hazard maps typically do not exist.	When cost or time considerations prohibit site-specific study.	See National Tsunami Hazard Mitigation Program website. www.pmel.noaa.gov/tsunami-hazard/
	Site-Specific– Level 3	Office-based studies are required to estimate tsunami or seiche hazard.	Studies would provide more accurate information.	Studies would be too time consuming unless a sufficient amount of previous work had been done to serve as a starting point.	When key components are located in high tsunami/seiche hazard areas.	Synolakis 2003

Table 2-2. List of Current Procedures and Practices for Quantifying Ground-Movement Hazards (non-earthquake induced)

GROUND-MOVEMENT HAZARD	PROCEDURES AND PRACTICES	DESCRIPTION OF METHOD USED TO QUANTIFY LIKELIHOOD OF HAZARD	PROS	CONS	WHEN APPLICABLE	RESOURCE DOCUMENTS DESCRIBING METHODOLOGY
• **Gravity Landslide** • **Expansive Soil** • **Soil Collapse** • **Frost heave**	**Expert Opinions– Level 1**	Estimates based on previous work of expert.	Estimates likely to be better than those obtained directly from available regional studies.	Approach may not provide accurate assessment of hazard if expert does not have adequate local database.	When data or publications on hazard in location of interest are not available or too time consuming to compile or interpret.	Not applicable
	Published Data/Information– Level 2	Relevant data/information obtained from credible publications or websites.	Data/information can be obtained quickly.	If available, data/information is usually for broad regions at small scales and thus not very useful for specific local areas. None of the information is cast in a probabilistic framework suitable for risk analysis.	When adequate information is available.	Many publications are available and can be obtained by using library reference or web searches. However, few are likely to have information for a particular location. The USGS, NOAA, and state geological survey websites can be quick sources of information.
	Site-Specific– Level 3	Qualified professional firm performs evaluations and analysis.	Approach better addresses local hazards if expert opinions and published data/information are not available or feasible.	Can be expensive and time consuming and would only provide a qualitative description of likelihood of hazard (e.g., low, moderate, high) and perhaps its possible extent of movement.	When key components are located in vicinity of hazard that is considered potentially severe and when other approaches are inadequate.	Many publications are available on the identification and evaluation of the hazard, but none presents method to quantify hazard probabilistically for risk assessment.

Table 2-3. List of Current Procedures and Practices for Quantifying Wind Hazards

WIND HAZARD	PROCEDURES AND PRACTICES	DESCRIPTION OF METHOD USED TO QUANTIFY LIKELIHOOD OF HAZARD	PROS	CONS	WHEN APPLICABLE	RESOURCE DOCUMENTS DESCRIBING METHODOLOGY
• **Windstorm** • **Tornado** • **Hurricane**	**Expert Opinions– Level 1**	Estimates based on previous work of expert in region of interest or in regions of similar wind characteristics. Expert performs few or no calculations and submits minimal documentation, such as a letter report.	Estimates can be quite accurate depending on qualifications and relevant experience of expert.	Approach is generally more time consuming and expensive than approaches using published information.	When published data are not available and site-specific approaches are too expensive.	Not applicable
	Published Data/Information– Level 2	Data obtained from national wind maps published in building codes and from literature.	Data can be obtained quickly and are usually accurate.	Information is usually regional and would likely overlook local conditions that could affect wind velocity.	When cost or time considerations prohibit site-specific studies.	Wind velocity maps can be found in ASCE 7-02, for example.
	Site-Specific– Level 3	Wind hazard computed using probabilistic wind hazard analysis (PWHA) similar to PSHA method for ground motion.	Method is most accurate and robust and can include local data affecting wind velocities.	Implementation of method is more expensive and time consuming than other two approaches.	When cost and time considerations are not excessively restrictive. Method is more appropriate for large systems affecting major population centers in wind hazard areas or for systems that would have adverse consequences, if incapacitated.	Site-specific model can be constructed from information in ALA 2002a, 2002b.

Table 2-4. List of Current Procedures and Practices for Quantifying Icing Hazards

ICING HAZARD	PROCEDURES AND PRACTICES	DESCRIPTION OF METHOD USED TO QUANTIFY LIKELIHOOD OF HAZARD	PROS	CONS	WHEN APPLICABLE	RESOURCE DOCUMENTS DESCRIBING METHODOLOGY
Ice Accumulation on Structures, Equipment, etc.	**Expert Opinions– Level 1**	Estimates based on previous work of expert in region of interest or in regions of similar icing characteristics. Expert performs few or no calculations and submits minimal documentation, such as a letter report.	Estimates can be quite accurate depending on qualifications and relevant experience of expert.	Approach is generally more time consuming and expensive than approaches using published information.	When published data are not available and site-specific approaches are too expensive.	Not applicable
	Published Data/Information– Level 2	Data obtained from publications, maps.	Data can be obtained quickly and are usually accurate.	Information is regional and may overlook local conditions.	When cost or time considerations prohibit site-specific studies.	The U.S. Army Corps of Engineers Cold Regions Research and Engineering Laboratory (CRREL) website (www.crrel.usace.army.mil/) has information including links to U.S. map of ice accumulation with 50-yr mean recurrence. ASCE Standard 7-02 (ASCE 2003a) also provides icing maps for the U.S.
	Site-Specific– Level 3	Probabilistic model based on meteorological data and local conditions.	Method is most accurate and can account for local conditions.	Implementation of method is more expensive and time consuming than other two approaches.	When cost and time considerations are not excessively restrictive. Method is more appropriate for large systems affecting major population centers in icing hazard areas or for systems that would have adverse consequences, if incapacitated.	Site-specific model can be developed from sufficient historical ice storm data.

Table 2.5. List of Current Procedures and Practices for Quantifying Flood Hazard

FLOOD HAZARD	PROCEDURES AND PRACTICES	DESCRIPTION OF METHOD USED TO QUANTIFY LIKELIHOOD OF HAZARD	PROS	CONS	WHEN APPLICABLE	RESOURCE DOCUMENTS DESCRIBING METHODOLOGY
• **Riverine** • **Headwater** **(Flood from dam or tank failure is not a natural hazard, but should be considered)**	**Expert Opinions– Level 1**	Estimates based on previous work of expert in region of interest or in regions of similar flood characteristics. Expert performs few or no calculations and submits minimal documentation, such as a letter report.	Estimates can be quite accurate depending on qualifications and relevant experience of expert.	Approach is generally more time consuming and expensive than approaches using published information.	When published data are not available and site-specific approaches are too expensive.	Not applicable
	Published Data/Information– Level 2	Hazard maps and data available from FEMA, USGS, NOAA, USACOE.	Data can be obtained quickly and are usually accurate.	Local conditions affecting hazard may be overlooked.	When cost or time considerations prohibit site-specific studies.	ALA 2002a, 2002b; FEMA 1996
	Site-Specific– Level 3	Flood hazard computed using established probabilistic methods incorporating regional and local data.	Method is most accurate.	Implementation of method is more expensive and time consuming than other two approaches.	When cost and time considerations are not excessively restrictive. Method is more appropriate for large systems affecting major population centers in flood hazard areas or for systems that would have adverse consequences, if incapacitated.	ALA 2002a, 2002b

2.2 Human Threat Assessment

Human threats encompass a wide range of possible hazards: biological, chemical, radiological, blast, cyber and physical attacks. Unlike threats from natural hazards, human threats are more difficult to quantify and there is usually very little statistical information upon which to draw. Furthermore, the available information may be proprietary or confidential for business and/or security reasons. Because of these challenges, assessment of human threats must be based on new and partially tested methods. In many cases, relying on experts (particularly those knowledgeable about these threats) is the only useful means of establishing threat characteristics and likelihoods.

2.2.1 General Description of Methods

The three general methods for assessing human threats are:

- **Estimate** methods are based on judgment or the determination of individuals who have specific knowledge about potential human threats (i.e., Director of Security, Chief Information Officer). This method applies mainly to internal company resources.
- **Expert opinion** methods are based on the opinions or judgment of informed individuals (e.g., law enforcement or military intelligence officers who have access to current human threat information), individuals from the academic or consulting community that study particular types of human threats, or other individuals who can be considered experts by virtue of their knowledge of prior events on specific components or systems.
- **Statistical** methods are based on a probabilistic analysis of specific types of human threats that identify their potential or likelihood. The methods may involve the use of proprietary databases that may reside only within the company's data files.

2.2.2 Methods to Assess Human Threats

Table 2-6 lists general methods used for assessing human threat potential. In addition to describing each method, the benefits (pros) and limitations (cons) of each method are identified.

Table 2-6. List of Current Procedures and Practices for Quantifying Human Threats

PROCEDURES & PRACTICES	DESCRIPTION OF THE METHOD	PROS	CONS
Estimate–Level 1	Estimates based on judgment or the determination of informed utility personnel (i.e., Director of Security, Chief Information Officer) or other individual who has specific knowledge about potential human threats.	Can be an inexpensive and quick approach because of the reliance on personal expertise and knowledge.	This approach is limited by prior knowledge of the human threat. Individuals with knowledge about one type of hazard may not be aware of other types of hazard.
Expert Opinion–Level 2	Opinions based on the judgment of informed outside individuals (i.e., law enforcement or military intelligence officers who have access to current human threat information), individuals from the academic or consulting community who study particular types of human threats or other individuals who can be considered experts by virtue of their knowledge of prior events on specific components/systems.	Can provide confidence in the evaluation of the likelihood of one or more human threats. Confidence comes from the identification of adversary, intent, capability, history, and quantifiable threat levels. This method can be accurate enough to base specific mitigation measures on.	This method is generally more expensive and time consuming than a potentially readily available estimating method. This method may be moderately time consuming to locate and obtain a qualified opinion of the threat to particular components/systems. This method provides a qualitative rather than a quantitative estimate. As a result, the estimate is generally not very precise.
Statistical–Level 2	Probabilistic analysis of specific types of human threats to identify their potential or likelihood.	Provides a mathematically robust evaluation of verifiable, existing data that can be used in a statistical evaluation of risk. Sources may include open file reports or local, state or federal agencies or their information centers.	This evaluation may be very precise in describing the hazard, but potentially can be inaccurate because of the historical data of particular types of human threats on specific components; systems may not be available or may not be credible. Historical data are often proprietary and not available in open file reports or available from governmental agencies.

2.3 Assessment of Electric Power Equipment Vulnerabilities – Natural Hazards

Unlike human threats, there is broad experience with the performance of electric power equipment in natural hazards events, although the data have not been extensively rigorously and systematically collected and analyzed. In this section, methods that have been used in prior studies to assess the level of vulnerability of electric transmission and distribution equipment types are presented. After the different types of methods are defined, Table 2-7 describes their application.

2.3.1 General Description of Methods

The four methods used to assess electric power equipment performance due to natural hazards are:

- **Estimate** methods use judgment based on indirect or inference from knowledge. Usually senior or the most knowledgeable staff members individually estimate vulnerability and then compare their estimates in a group.
- **Informed estimates** methods use judgment based on direct knowledge of component performance. This assessment can consider vulnerability for varying levels of hazard intensity. As in the estimate method, senior staff members individually estimate vulnerability and then compare estimates as a group.
- **Statistical** methods are based on experience data, often acknowledging different hazard loading levels. This method is mostly applied in the case of earthquake studies, where some data sets on past performance have been compiled.
- **Analytical** methods are based on structural evaluations of deflections, strains, and in some cases, stress at key locations. The most detailed of all methods mentioned. Usually requires the use of structural analysis software codes.

2.3.2 Equipment Performance in Natural Hazard Events

Table 2-7 lists methods that have been used to assess electric power equipment performance due to natural hazard loads. As in other previous tables, the advantages and disadvantages in using each method and resource documents are included.

Table 2-8 describes the various kinds of loading that can be used for equipment qualification. In general, these methods apply to earthquake loadings.

Table 2-7. List of Current Procedures and Practices for Quantifying Equipment Component Vulnerability in Natural Hazard Events

METHOD	DESCRIPTION OF THE METHOD	PROS	CONS	WHEN APPLICABLE	RESOURCE DOCUMENTS DESCRIBING METHODOLOGY
Estimate– Level 1	Use of judgment based on indirect or inference-based knowledge. Senior or most knowledgeable staff first estimate vulnerabilities individually and then compare and discuss in a group to arrive at a consensus. *For example:* Low voltage switchgear used in navy destroyer ships will likely withstand earthquake shaking; a 220kV circuit breaker (CB), similar in all respects including manufacturer when compared to a qualified 500kV CB, will likely be at least as robust as the 500kV CB. Some components fail for no apparent reason during an earthquake and some have relatively low conductor slack. In future earthquakes, components connected with less slack will tend to fail more than those with more slack.	This approach can create data where there is none and allows the user to enter his limited knowledge in a risk assessment tool. This method can be a very inexpensive and offers a quick approach because the individual or team relies on his or their own expertise and knowledge.	User can be led to believe that the final answer is more accurate than it really is. Accuracy is based on the team guessing the critical failure modes and load amplitudes. Confidence in the answers should be low.	Use when very little or no experience data exists. Results based on this data should only be used to determine whether potential for significant risk from hazard exists or plan for post disaster response.	PEER report, internal utility memos. See http://peer.berkeley.edu/
Informed Estimates– Level 1	Use of judgment based on direct knowledge of component performance to varying hazard intensity or similar applicable loading (for earthquakes, see Table 2-8). Senior or most knowledgeable staff, first estimate performance individually and then compare and discuss in a group and arrive at a consensus. *For example:* Based on past experience, certain 220kV LT (live tank) CBs (circuit breaker) are consistently more damaged than DT (dead tank) CBs to earthquake loading. In a future earthquake, 220kV CBs in position with LT CBs will likely fail before those with DT CBs.	This approach provides data that is based or anchored to experience. This method can be very inexpensive.	User can be led to believe that the final answer is more accurate than it really is. Accuracy is based on the data being applicable. Confidence in the answers can be very low to high depending on the amount and nature of data.	Use when some experience data exists but not enough to have well-behaved statistics. Results based on this data should only be used to determine whether potential for significant risk from hazard exists, plan for post disaster response, or identify relatively vulnerable points in system.	PEER report, internal utility memos; EPRI 2002
Statistical– Level 2	Probabilistic analysis of components based on experience data derived from previous hazard loading or various similar loading sources (for earthquakes, see Table 2-8) on similar components. *For example:* Based on experience data, a certain component has a stated probability	Provides a mathematically robust evaluation of existing data that can be used in a statistical evaluation of risk. This approach is only a little more	This evaluation may be very precise in describing the hazard, but can be inaccurate in assessing performance because the historical data	Can be used for determining accurate return on investment for proposed system upgrades.	Sources may include open file reports from local, state, and federal agencies or their information centers.

METHOD	DESCRIPTION OF THE METHOD	PROS	CONS	WHEN APPLICABLE	RESOURCE DOCUMENTS DESCRIBING METHODOLOGY
	of failure when earthquake induced shaking reaches a certain level.	expensive than using estimates or informed estimates if the data exist.	may not be available or may not be applicable.		
Analytical– Level 3	Mathematical evaluation that involves modeling component to obtain deflections, strains, and in some cases, stress at key locations of component with various mountings to various motions. *For example:* Based on calculations, when a certain component is subjected to a defined level of shaking, enough members yield such that a mechanism is created. The amount of potential energy in the system will drive the mechanism such that displacement constraints are exceeded and by definition the component fails.	This method is very flexible in that any condition that is desired can be modeled and studied. This method can be relatively expensive, even for one component.	Modeling certain failure modes of electrical components requires an understanding of the failure process.	Can be used for raising confidence of any fragility model derived from estimates or informed estimates.	PEER reports CEC website

Table 2-8. Loading Sources for Component Vulnerability Analysis – Earthquake

DATA SOURCE	DESCRIPTION	PROS	CONS	USE	REFERENCES
Shipping	Documenting loading that components undergo while being shipped. Compare shipping loading to hazard loading.	Shipping loading is actual loading that equipment has actually experienced. Shipping loads may exceed hazard loads, is inexpensive, and there is a high confidence in its reliability.	Shipping load data may not apply because some equipment (especially fragile equipment) may be disassembled and protection packaged for shipment or there are problems duplicating installation conditions. Components are not loaded to failure so shipping data may underestimate fragility.	This approach is best used to verify that a component is robust under hazard loading. This data can be used to develop results based on estimates alone when no other data exists and to augment data based on informed estimates and verify statistical data.	Internal utility memos
Qualification Testing	Qualification testing (QT) of component to IEEE 693 or other standard.	QT data can be created as needed. Lots of QT data already exists (many components tested) and more data is being generated all the time. QT data represents actual shaking of component so that all QT tested component failure modes are considered. There is high user confidence.	There is inadequate low frequency content in QT table motion. Some equipment can't be QT'd. During QT, there are problems duplicating installation and mounting conditions. QT is relatively expensive, there is insufficient data for any one component to provide high math confidence in a risk assessment. During QT, component is not taken to failure, so QT data underestimates fragility.	This data can be used to develop results based on estimates when no other data exists and to augment data derived from informed estimates and verify statistical data.	IEEE 693 Standard (1997)
Fragility Testing	Fragility testing (FT) of one or more components to failure. This could be a subset of qualification testing.	FT is actual shaking of component to failure. This is what is desired for a SERA (Ostrom 2003, Ostrom et al. 1992) analysis (a vulnerability assessment software program used by the power industry). FT can provide data of highest user confidence.	There is inadequate low frequency content in FT table motion. Some equipment can't be FT'd. During FT, there are problems duplicating installation and mounting conditions. FT is relatively expensive. Currently, there are insufficient data for any one component to provide high statistical confidence and there are no standards for assuring consistent FT.	These data can be used to develop values based on estimates, informed estimates, and/or statistics.	

2.4 Assessment of Building and Service Equipment Vulnerabilities

In the context of transmission and/or distribution of electricity, buildings and service equipment apply mainly to structures or buildings that house substation equipment or help in the monitoring and control of power distribution. Other buildings (offices, maintenance facilities, and control centers) are also important to a performance assessment. Services for these buildings can be varied and include such systems as HVAC, telecommunication, and data processing systems.

2.4.1 General Description of Methods

The four general methods for assessing the vulnerability of buildings are:

- **Graphic** methods allow simple overlays of building locations and hazard maps, which are generally applied with the use of GIS methodologies or mapping tools. These methods require the existence of regional or national hazard maps and relies on one's judgment to assign vulnerability based upon hazard severity.
- **Loss estimation tools** utilize standard vulnerability models. A good example is HAZUS, a standardized loss estimation tool developed for the Federal Emergency Management Agency (FEMA) for earthquake, wind, and flood hazards. Generally applicable for the analysis of large portfolios of buildings and structures. General-use loss estimation tools (e.g. HAZUS) are less well developed for building service equipment than for building structures and are rather crude for electric power equipment.
- **Expert screening with site surveys** relies on the expertise of structural engineers. Uses detailed information on the design and construction of a building; may involve simple calculations to estimate general loads and structural capacities. An on-site inspection by the engineer is almost always required. Site surveys to evaluate electric power equipment are generally referred to as "walk-downs" and involve observation of equipment anchorage and bracing conditions, classification of components for vulnerability, and detection of obvious site deficiencies (e.g., landslide hazard).
- **Structural analysis** methods are based on the use of structural analysis techniques (e.g., finite-element modeling or time-history analysis). This requires detailed information on the building and its components. Can predict or estimate where weak links in a building or system exist. Structural analysis of equipment for seismic loads may involve computing the severity of shaking demands (spectra) at equipment mounting points for comparison with equipment qualification specifications developed through shake-table testing.

2.4.2 Methods to Assess Building and Service Equipment Vulnerabilities

Table 2-9 lists methods by which to quantify the vulnerability of buildings and their associated equipment and when each method is most applicable. In addition, a list of resource documents that give additional examples of how these methods have been applied in practice is provided.

Table 2-9. List of Current Procedures and Practices for Quantifying the Vulnerability of Buildings and Service Equipment

SYSTEM / COMPONENT	METHOD	DESCRIPTION OF METHOD	PROS	CONS	WHEN APPLICABLE	RESOURCE DOCUMENTS DESCRIBING METHODOLOGY
Buildings	**Basic GIS– Level 1**	Screening method that relies on judgment in combination with natural hazard depictions using GIS tools or published digital data and maps.	Rapid and efficient. Identifies which natural hazards can affect the system. Eliminates some hazards from further consideration for all or some of the system. May suggest alternative locations for new facilities.	Very crude and approximate. Does not consider specific component vulnerability. Does not provide estimates of risk in terms of dollar losses or risk mitigation options.	This is appropriate as a first step in any analysis, at any level. For larger utilities, this may be performed in-house, to define a further scope of work to be executed by others. Especially useful for flood, where elevation of building compared to flood levels determines risk.	Uniform Building Code (ICBO 1997); ASCE Standard 7-02 (2003a); International Building Code 2003 (ICC 2002)
	Loss Estimation Software– Level 2	Desktop study using HAZUS or other scenario-based risk assessment software, with multi-hazard capability.	Rapid and efficient. Provides preliminary, order-of-magnitude estimates of economic loss and downtime for the defined (usually maximal) scenarios. May serve as a basis for eliminating some hazards or part of the system from further evaluation.	Crude and approximate. Limited to arbitrarily defined scenarios. Few "system" models are provided, so business interruption loss estimates are crude. Does not provide loss reduction measures or quantify their benefits. May require several consultants with different software packages, which can produce inconsistent results.	HAZUS is only applicable to earthquake, wind, and flood. Such software provides only a subset of the total financial losses and downtime for building and a few common equipment types.	FEMA 2003a; Wong et al. 2002
	Expert Screening with Site Surveys– Level 2	Vulnerability screening survey by experts. Includes walkdown to identify structural categories, typical weaknesses, and candidate loss reduction measures for each significant hazard. Criticality, costs, and benefits of each risk reduction measure are qualitatively rated.	Rapid and efficient. Defines significant concerns for each hazard. When considered in combination with hazard severity and frequency, this method can be used to identify buildings requiring further study using more formal, quantitative methods.	Approximate and judgmental. Results vary according to the framework and personnel used to do the survey. This is a simple approach, but demands high level of experience and judgment to be effective.	Appropriate for large or for critical buildings, such as emergency operations centers, engineering offices, and for facilities required for post-event repair and recovery. May be appropriate for intermediate-sized buildings, especially where previous screening studies have identified potential high risks.	Earthquake: Scawthorn 1986; ASCE/SEI 31-03 (2003b); FEMA 356 (2000). Wind and flood: ASCE 7-02 (2003a). Blast, fire, and other impacts: FEMA 386-7 (2002a). FEMA 426 (2003b)

Table 2-9. List of Current Procedures and Practices for Quantifying the Vulnerability of Buildings and Service Equipmenet (continued)

	Engineering Structural Analysis– Level 3	Methods based on the use of structural analysis techniques (e.g., finite-element modeling) or time-history analysis. Requires detailed information on the building and its components. Can predict or estimate weak links in a building or system.	Improved accuracy. Allows rational, systematic assessment of many aspects of building vulnerability, the determination of damage states for various scenarios, and the effectiveness, in terms of reductions in overstress or drift, or various structural retrofit options.	Requires quantitative evaluation of hazard scenarios. Costly and time consuming. Results vary with methods and software chosen, expertise of user, etc. Often difficult to assign dollar losses to buildings or components for a given damage state.	Appropriate for large or critical buildings, such as emergency operations centers, utility engineering offices, and for facilities required for post-event repair and recovery. May be appropriate for intermediate-sized buildings important to operations, especially where previous screening studies have identified potential high risks.	Earthquake: Scawthorn (1986); ASCE/SEI 31-03 (ASCE, 2003b); FEMA 356 (2000) Wind and flood: ASCE 7-02 (2003) Blast, fire, and other impacts: FEMA 386-7 (2002a); FEMA 426 (2003b)
Building service equipment	**Expert Screening with Site Surveys– Levels 1, 2**	Vulnerability screening survey by experts or specially trained maintenance personnel. Includes walkdown to identify typical weaknesses and required loss reduction measures for each significant hazard. Criticality, costs and benefits of each risk reduction measure are qualitatively rated– Levels 1, 2.	Rapid and efficient. Defines significant concerns for each hazard. May be used to assign vulnerability relationships. When considered in combination with hazard severity and frequency, this method can then be used in quantitative methods.	Approximate and judgmental. Results vary according to the framework and personnel used to do the survey. This is a simple approach, but demands high level of experience and judgment to be effective.	Appropriate for equipment important to the function of large or for critical buildings, such as emergency operations centers, utility engineering offices, and for facilities required for post-event repair and recovery. Appropriate for intermediate-sized buildings, especially where post-event function is important.	Earthquake: FEMA 74 (1994); McGavin (1981); McGuire (1990) Wind & flood: ASCE 7-02 (2003a) Blast, fire, and other impacts: FEMA 386-7 (2002a); FEMA 426 (2003)

2.5 Assessment of Equipment Vulnerabilities – Human Threats

The operating equipment in electric power systems may be vulnerable to human threats, which include: a) biological, b) chemical, c) radiological, d) blast, e) cyber and f) physical attacks. The types of equipment that are being considered include those associated with low voltage control, protection, and communication systems (e.g., SCADA).

2.5.1 General Description of Methods

Four methods are used to assess human threats to equipment:

- **Estimate** methods are based on the judgment or the determination of individuals (i.e., Director of Security, Chief Information Officer), or other individuals who have specific knowledge about component/system vulnerabilities. This method applies mainly to internal resources.
- **Expert opinion** methods are based on the judgment of informed individuals (e.g., law enforcement, military intelligence officers), or other individuals who can be considered experts by virtue of their knowledge of prior events on specific components and systems and are knowledgeable about network architecture, system components, barrier systems, SCADA, computer security systems, business procedures and databases and communications systems.
- **Penetration tests** are methods that involve active scanning and/or penetration tools for identifying vulnerabilities. These methods often involve the establishment of rules of engagement, a white cell for continuous communication with the electric power utility, and an undercover red cell that performs the reconnaissance, scenario development, and exploitation.
- **Simulation** methods are especially adaptable for measuring system impacts or effects. They usually require a detailed characterization of the system and its operation. This method can be limited using specific scenarios or fully probabilistic (i.e., accounting for all quantifiable uncertainties, including the occurrence of the threat).

2.5.2 Equipment Vulnerabilities from Human Threats

Table 2-10 contains a preliminary list of current procedures and practices for quantifying the vulnerability of equipment due to human threats. In addition, the advantages and disadvantages of each method are identified.

Table 2-10. List of Current Procedures and Practices for Quantifying Component Performance Against Human Threats

METHOD	DESCRIPTION OF THE METHOD	PROS	CONS
Estimate–Level 1	Estimates based on judgment or the determination of individuals (i.e., Director of Security, Chief Information Officer) or other individual who has specific knowledge about component and system vulnerabilities.	Can be an inexpensive and quick approach because the individual performing the assessment relies only on personal expertise and knowledge.	This approach is limited by the individual's prior knowledge of the component and system vulnerabilities. Individuals with knowledge about one type of component or system may not be aware of other types.
Expert Opinion–Level 1	Opinions based on the judgment of informed individuals (i.e., law enforcement, military intelligence officers) or other individuals who can be considered experts by virtue of their knowledge of prior events on specific components and systems and are knowledgeable about network architecture, system components, barrier systems, access-control systems, SCADA, computer security systems, business procedures and databases, and communication systems.	Can provide confidence in the evaluation of vulnerability of components or systems. Confidence comes from the thorough identification of all critical system components and their various vulnerabilities. This method can be accurate enough to base specific mitigation measures on.	This method is generally more expensive and time consuming than a potentially readily available estimating method. This method may be moderately time consuming to survey each site and conduct interviews of staff who operate the components and systems. This method provides a qualitative rather than a quantitative estimate. As a result, the estimate is generally not very precise.
Penetration Tests–Levels 2, 3	Active scanning and penetration tools are used to identify vulnerabilities. Often involves the establishment of rules of engagement, a white cell for continuous communication with the utility, and an undercover red cell that performs the reconnaissance, scenario development, and exploitation.	Provides a quantitative evaluation of a facility or computer system's vulnerability. The evaluation includes the amount of effort required to exploit the vulnerability and perform the penetration. Penetration tests can be conducted on a regular basis to determine the effectiveness of mitigation measures.	Generally limited to a particular set of components and systems within the utility to avoid disruption of normal services provided by the utility. If a large number of facilities or computer systems are tested, this method can be expensive and very time consuming.
Simulation–Level 3	Possible failure or disruption modes are simulated using commercially available software (Ponist 2003; SNL 2002) or internal tools or methodologies.	Sophisticated software tools can provide the most robust estimates of impacts. In general, very useful in developing "what-if" scenarios for planning.	Effort can be significantly greater and may require the use of software with significant data needs or requirements. May require special training in order to implement in-house.

2.6 System Performance Assessment

Methods for quantifying the performance of electric power systems are based on systems analysis techniques that can range from graphic methods to sophisticated simulation models. An important factor in deciding the right method is understanding how the results of the analysis will be used. For this reason, two additional parameters in defining methods for system performance assessment are helpful: desired outcome and key performance metrics. By including these two factors, it will become clearer which analyses are most appropriate for the assessment.

2.6.1 System Outcomes and Performance Metrics

Six different performance metrics are used in this guideline and shown in Guideline Table 2-1. These metrics are used to measure the four identified desired outcomes (performance targets). The metrics and desired outcomes that are considered in this guideline are:

Desired Outcomes	System Performance Metrics
Protect Public and Utility Personnel Safety	• Casualties (deaths and injuries) • Hazardous Materials Spillage
Maintain System Reliability	• Service Disruption • Downtime
Prevent Monetary Loss	• Capital Loss • Revenue Loss • Service Disruption • Downtime • Hazardous Materials Spillage
Prevent Environmental Damage	• Hazardous Materials Spillage

2.6.2 General Description of Methods

The three methods of measuring system performance are:

- **Graphic** methods allow easy fusing of hazard and system information. Usually, these methods are implemented using some type of Geographic Information System (GIS) or tool. By overlaying hazard maps (e.g., location of liquefiable areas, flood hazard zones, or extreme wind areas) onto system maps, a user can make a quick and simple assessment of whether the system is exposed to a significant hazard.
- **Localized** methods can account for some local and/or detailed information on the system based on statistical methods or procedures. Usually applied to small systems or to systems that are dependent on a single component or node (e.g., a small distribution system that has no power generation or transmission). Very applicable to

estimating direct mean capital losses; not so useful for measuring system effects (e.g., impacts from system disruption).

- **Simulation** methods are especially adaptable for measuring system impacts or effects. Usually requires a detailed characterization of the system by a computer network model, including detailed information on the performance of individual elements and detailed mapping of hazards for large regions. More applicable to highly networked transmission or distribution systems. This method can be limited using specific scenarios of interest or fully probabilistic (i.e., accounting for all quantifiable uncertainties, including the occurrence of the hazard). That is, one scenario can be analyzed or multiple scenarios can be investigated.

2.6.3 Assessing System Performance

Table 2-11 describes the pros and cons and applicability of various methods of quantifying system performance. These methods are described in relation to the desired outcomes that are being sought. Citations are provided as a resource for understanding in detail the methodology being presented.

Table 2-11. List of Current Procedures and Practices for Quantifying System Performance

DESIRED OUTCOME	KEY PERFORMANCE MEASURE(S)	PROCEDURES AND PRACTICES	PROS	CONS	WHEN APPLICABLE	RESOURCE DOCUMENTS DESCRIBING METHODOLOGY
Protect Public and Personnel Safety	**Casualties (deaths, injuries)** **Hazardous Materials Spillage**	**Graphic– Level 1**	Simple screening method or scoping study approach and can provide helpful visual displays for decision makers. Easily understood by public safety agencies.	Cannot provide reliable (neither accurate nor precise) measure of expected number of casualties either in the public sector or within company facilities, or impact of hazardous materials releases.	For scoping a study, convincing top-level management to undertake a detailed study or providing illustrations of results of a more detailed evaluation.	
		Localized Using Mean Estimates – Level 2	Provides rough mean estimates of casualties. Considers specifics of components at each site. Can provide general assessment of impact of hazardous materials release.	Cannot provide precise estimates of casualties. Requires more effort to apply.	When the primary concern is with an estimate of average casualties or when the critical facilities, the exposures, or the hazard(s) in question are fairly localized.	Matsuda et al. 1991 ; Seligson et al. 1996
		Simulation (Limited or Full Probabilistic Analysis)–Level 3	The full probabilistic method provides a full account of uncertainties. The limited method permits quality assurance with respect to detail. Both the limited and full methods permit a broader range of hazard intensity.	Casualty estimation is crude to date. Estimates based on simulation analysis will be approximate due to the many factors that influence life safety concerns.	When it is desirable to develop a distribution of casualties.	Limited: Shinozuka and Hwang 1998; Ostrom et al. 1992; Ostrom et al. 1990; Matsuda et al. 1991; Rose 1999; Chang et al. 1995 Full: Moghdaderi-Zadeh 1992; McGuire 1990; Taylor et al. 2001; Perkins and Taylor 2003
Maintain System Reliability	**Service Disruption (% service population)** **Downtime (hours)**	**Graphic–Level 1**	Simple screening method or scoping study approach and can provide helpful visual displays for decision makers. Easily understood by operations and maintenance personnel.	Cannot provide reliable (neither accurate nor precise) measure of % of customers without service. Does not consider the network features of a system.	For scoping a study, convincing top-level management to undertake a detailed study, or providing illustrations of results of a more detailed evaluation.	

Table 2-11. List of Current Procedures and Practices for Quantifying System Performance (continued)

DESIRED OUTCOME	KEY PERFORMANCE MEASURE(S)	PROCEDURES AND PRACTICES	PROS	CONS	WHEN APPLICABLE	RESOURCE DOCUMENTS DESCRIBING METHODOLOGY
		Localized Using Mean Estimates–Level 2	Provides rough levels (ranges) of customer outages. Considers specifics of components at each site. Can be shared with public safety agencies.	Cannot provide precise estimates of % of customer outages. Can only provide macro information on outages originating in the distribution system. Requires more effort to apply.	When the primary concern is with an estimate of average outages or when the critical facilities, the system as a whole, customer service areas, or the hazard in question can be treated as being fairly localized.	Matsuda et al. 1991
		Simulation (Limited or Full Probabilistic Analysis) – Level 3	The full probabilistic method provides an analysis of outage areas based on network connectivity, projected failure modes, and simulation of many events. The limited method permits quality assurance with respect to detail.	Effort is significantly greater than localized methods. Limited simulations cannot provide robust statistics.	When it is desirable to develop a distribution of % of customers without service or to produce outage area maps.	Limited: Shinozuka and Hwang 1998; Ostrom et al. 1992; Ostrom et al. 1990; Matsuda et al. 1991; Rose 1999 ; Chang et al. 1995 Full: Moghdaderi-Zadeh 1992; McGuire 1990; Taylor et al. 2001; Perkins and Taylor 2003
Prevent Monetary Loss	**Capital Losses ($)** **Revenue Losses ($)** **Service Disruption (% service population)** **Downtime (hours)**	**Graphic–Level 1**	Simple screening method or scoping study approach; can provide helpful visual displays for decision makers.	Cannot provide reliable (neither accurate nor precise) measure of dollars saved.	For scoping a study, convincing top-level management to undertake a detailed study, or providing illustrations of results of a more detailed evaluation.	Ostrom and Gould 1986
		Localized Using Mean Estimates–Level 2	Provides an approach that is more reliable relative to a mean estimate. Considers specific conditions at site (e.g., design or construction details).	Does not provide an account of volatility (i.e., capital risks) of investments in natural hazards. Requires more effort to apply.	When the primary concern is with an estimate of average losses or when the critical facilities, the system as a whole, or the hazard in question is fairly localized.	Matsuda et al. 1991

Table 2-11. List of Current Procedures and Practices for Quantifying System Performance (continued)

DESIRED OUTCOME	KEY PERFORMANCE MEASURE(S)	PROCEDURES AND PRACTICES	PROS	CONS	WHEN APPLICABLE	RESOURCE DOCUMENTS DESCRIBING METHODOLOGY
		Simulation (Limited or Full Probabilistic Analysis)–Level 3	The probabilistic method provides full account of uncertainties and variability, including an account of volatility. The limited method permits quality assurance with respect to detail. Both the limited and full methods permit losses to be evaluated at a system level.	Effort is somewhat greater than localized methods. Limited simulations cannot provide robust statistics.	When it is desirable to develop a distribution of losses or view losses for system as a whole.	Limited: Shinozuka and Hwang 1998; Ostrom et al. 1992; Matsuda et al. 1991; Rose 1999; Chang et al. 1995 Full: Moghdaderi-Zadeh 1992; McGuire 1990; Taylor et al. 2001; Perkins and Taylor 2003
Prevent Environmental Damage	**Hazardous Materials Spillage**	**Graphic–Level 1**	Simple screening method or scoping study approach and can provide helpful visual displays for decision makers. Easily understood by operations personnel.	Cannot provide reliable (neither accurate nor precise) measure of extent of hazardous materials release.	For scoping a study, convincing top-level management to undertake a detailed study, or providing illustrations of results of a more detailed evaluation.	
		Localized Using Mean Estimates–Level 2	Provides rough delineation of affected areas. For liquids, could be used to estimate mean clean-up costs; For gases, could be used to identify mean influence areas based on hazardous material and wind speeds.	Cannot provide precise estimates of damage, or the uncertainty associated with mean estimates. Requires more effort to apply.	When the primary concern is with an estimate of average impacts; or when the critical facilities, the exposures are or the hazard in question is fairly localized.	
		Simulation (Limited or Full Probabilistic Analysis)–Level 3	The full probabilistic method provides a full account of uncertainty. The limited method permits quality assurance with respect to detail. Both methods provide a more reasonable assessment of risks due to hazardous materials release.	Effort is significantly greater than localized methods. Limited simulations cannot provide robust statistics.	When it is desirable to develop a distribution of impacts or consequences.	

3.0 Hazard Level Criteria

This guideline uses national hazard map data to help screen out sites or areas that are obviously not affected by certain hazards. It also provides a summary of the criteria that were used to judge whether areas were in low, moderate, or high hazard zones. The definitions and assumptions used to create the criteria are presented below. In addition, detailed tables showing these hazard levels by state and by county are contained in Appendix A of this commentary. These tables are ordered alphabetically by state and by county to make their use easy and practical.

The user should also note that hazard maps at other scales (geographic and risk-wise) can be used with this guideline. For example, the U.S. Geological Survey provides probabilistic ground motion maps for 2, 5, and 10 percent probabilities of exceedance in 50 years. Naturally, the ground motion values on these maps increase with decreasing probability of exceedance. Electric power utilities may elect to base Phase 1 screening or the determination of analysis levels on different probabilities of exceedance. The methodology provided in this guideline should accommodate the various maps with their associated probabilities of exceedance, but due consideration should be given to the choice of appropriate separation points for low, moderate, and high hazard levels.

Earthquake Hazard. The definition of earthquake hazard severity is based on the same criteria used in FEMA 154 (FEMA 2002b). FEMA 154 defines hazard levels with respect to two ground motion parameters specified by the U.S. Geological Survey based upon a probability of exceedance equal to two percent in 50 years (i.e., the design 5%-damped elastic spectral acceleration for a single-degree-of-freedom system with a period of 0.2 sec), and a similar measure for single-degree-of-freedom system with a period of 1.0 sec. These parameters have been transformed into peak ground acceleration (PGA) for this guideline. The hazard severity assignments for this guideline are based on:

High: PGA > 0.5 g
Moderate: 0.15 g ≤ PGA ≤ 0.5 g
Low: PGA < 0.15 g

Earthquake hazard level. This guideline uses the same earthquake hazard levels adopted by the authors of FEMA 154 (FEMA 2002b, ATC 2002); see Figure 3-1. This is a well-accepted, standard document for screening a building for potential seismic risk. It defines hazard levels with respect to two ground motion parameters specified in the IBC 2003, which in turn references maps published by NEHRP (National Earthquake Hazards Reduction Program) and the U.S. Geological Survey (USGS 1996a, 1996b, 1997b; Building Seismic Safety Council 2001; and Frankel et al. 2000). The ground motion parameters are the design 5%-damped elastic spectral acceleration for a single-degree-of-freedom system with a period of 0.2 sec, referred to as S_S, and a similar measure for single-degree-of-freedom system with a period of 1.0 sec, referred to as S_1. Both parameters are accelerations and are measured in units of distance per

unit time squared or, more conveniently, in multiples of gravity *(g)*. To simplify the application of these parameters for this guideline, these parameters were transformed into peak ground acceleration by dividing them by 2.5. A site with high earthquake hazard is defined as one with a PGA greater than 0.5g. A site with moderate hazard is defined as one that has a PGA greater than or equal to 0.15g and less than or equal to 0.5g. A site with low hazard is defined as one that has a PGA less than 0.15g. These separation points are judged to be reasonable in representing ground motions high enough to cause severe damage to electric power facilities (high), moderate damage to facilities (moderate), and little or no damage to facilities (low).

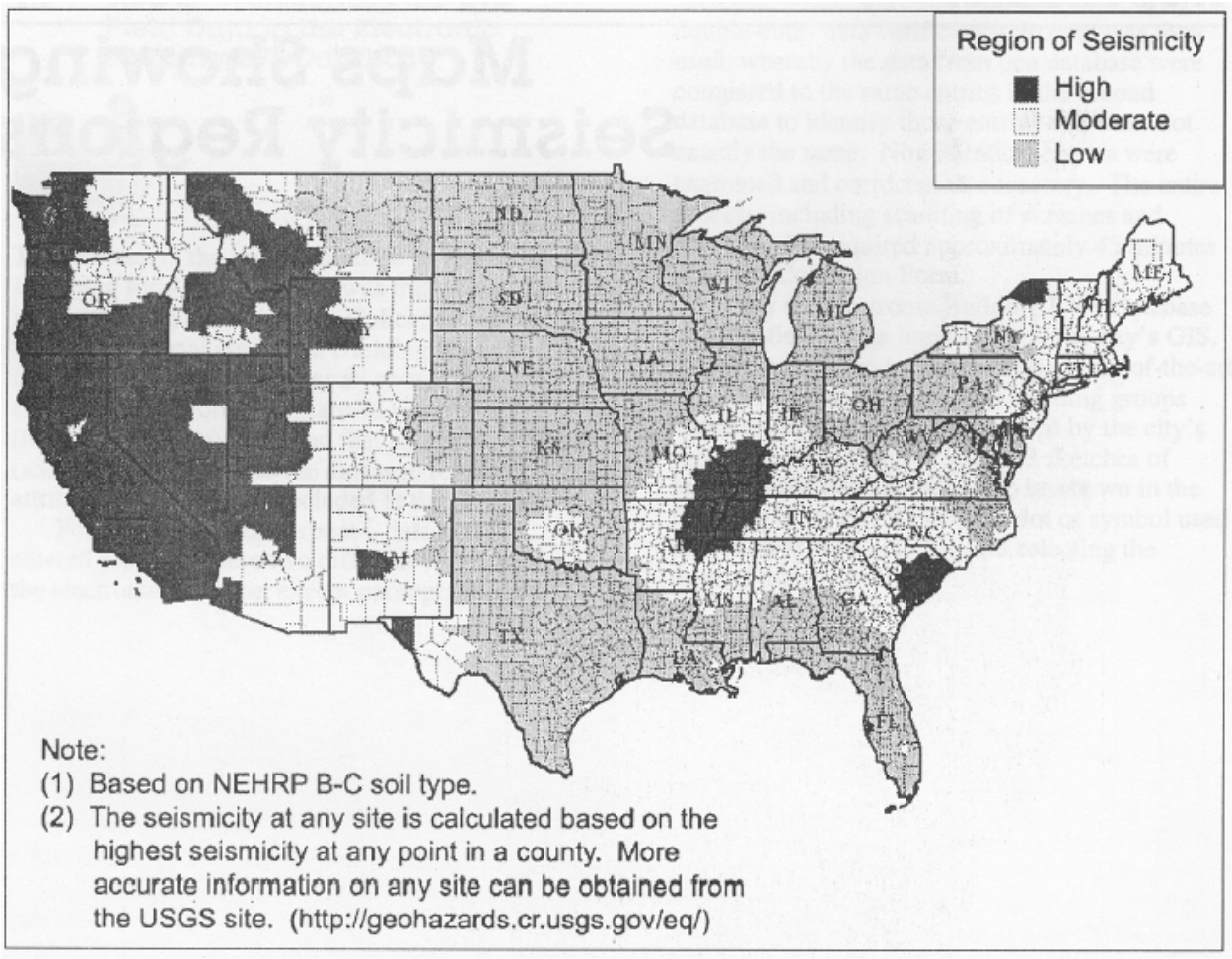

Figure 3-1. Seismic Hazard Map (FEMA 2002b, ATC 2002)

Landslide Hazard. The classification of landslide hazard severity is based on data from the national landslide overview map of the conterminous United States: USGS Open-File Report 97-289 (USGS 1997a); see Figure 3-2. Landslide incidence categories in that map are defined according to the percentage of the area involved in landslide process (High: > 15% of area involved, Moderate: 1.5–15% of area involved, Low: < 1.5% of area involved). Susceptibility to landslide is defined as the probable degree of response of formations to natural or artificial cutting, loading of slopes, or to anomalously high precipitation. High, moderate, and low

susceptibility are delimited by the same percentages used for classifying the incidence level. The hazard severity definitions for landslide are defined as:

> ***High***: High incidence or high susceptibility/moderate incidence or high susceptibility/low incidence
> ***Moderate***: Moderate incidence or moderate susceptibility/low incidence
> ***Low***: Low incidence

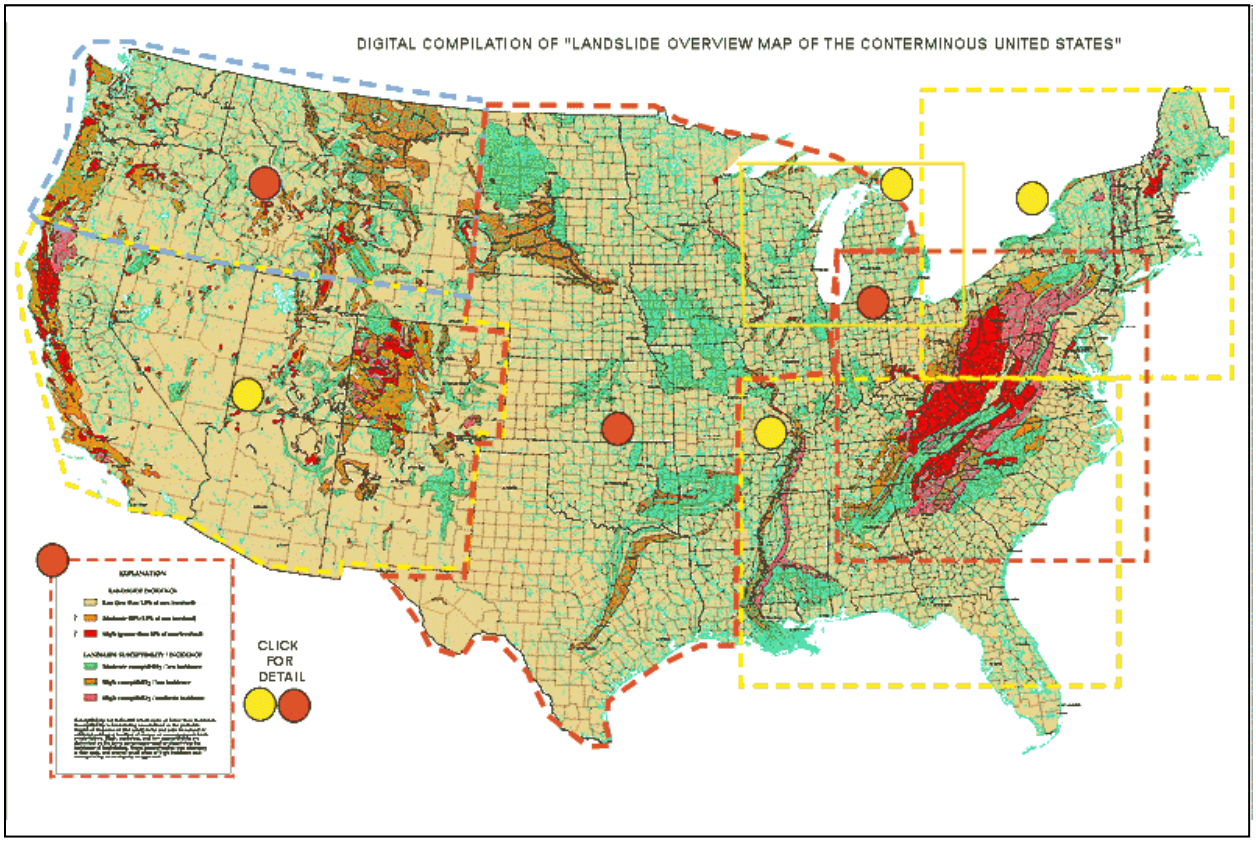

Figure 3-2. Landslide Map of the U.S. (USGS 1997a; for higher resolution images, visit http://landslides.usgs.gov/html_files/landslides/nationalmap/national.html)

Wind Hazard. The International Building Code (ICC 2002) was used in defining wind hazard levels. The IBC provides a map from ASCE-7-02 (ASCE 2003a), showing basic wind speeds for design. The following assignments were used to define wind hazard levels:

> ***High***: Wind speed ≥ 120 mph, or a Gulf/Atlantic county whose basic wind speed is 110 mph or greater, or in Hawaii.
> ***Moderate***: Wind speed > 90 mph, but < 120 mph
> ***Low***: < 90 mph

Tornado Hazard. Data from the National Oceanographic and Atmospheric Administration's (NOAA) Tornado Project database (NOAA 1999) were used to define hazard levels for tornadoes only.

> ***High***: > 25 Tornadoes/10,000 sq.mi.
> ***Moderate***: 5-25 Tornadoes/10,000 sq.mi.
> ***Low:*** < 5 Tornadoes/10,000 sq.mi.

Wind hazard level. In defining wind hazard levels, this guideline relies on two sources: the IBC 2003 and data from the National Oceanographic and Atmospheric Administration's (NOAA) Storm Prediction Center. The IBC provides a map showing basic wind speeds for design (see Figure 3-3). The IBC also provides two important definitions. It defines hurricane-prone regions as "The U.S. Atlantic Ocean and Gulf of Mexico coasts where the basic wind speed is greater than 90 mph and Hawaii, Puerto Rico, Guam, Virgin Islands, and American Samoa." It further defines wind-borne debris regions as "areas within hurricane-prone regions within 1 mile (1.6 km) of the coastal mean high water line where the basic wind speed is 110 mph (48.4 m/s) or greater; or where the basic wind speed is 120 mph (52.8 m/s) or greater; or Hawaii." For purposes of addressing tornado peril, this guideline defines observed tornado occurrences as tornados (F0 and greater) that appear in the database compiled by the Tornado Project (as its database existed on July 1, 2003). The Tornado Project's database contains data taken from NOAA's (1999) Historical Tornado Data Archive. Figure 3-4 shows the rate of tornado occurrence by state; Figure 3-5 shows these statistics by county.

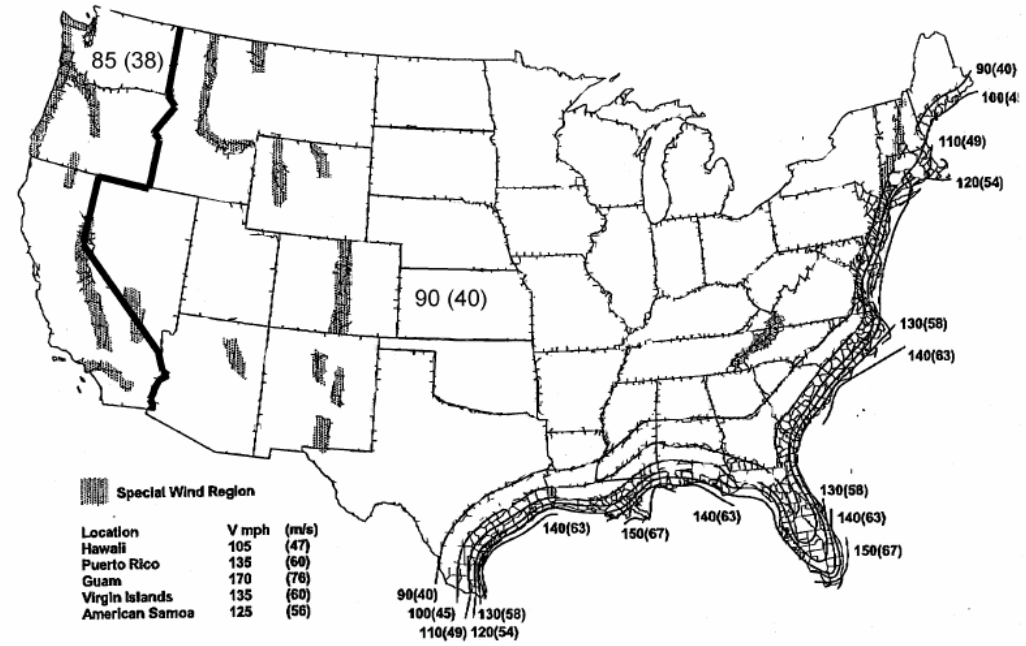

Figure 3-3. Basic Wind Speed Map (ASCE 2003a)

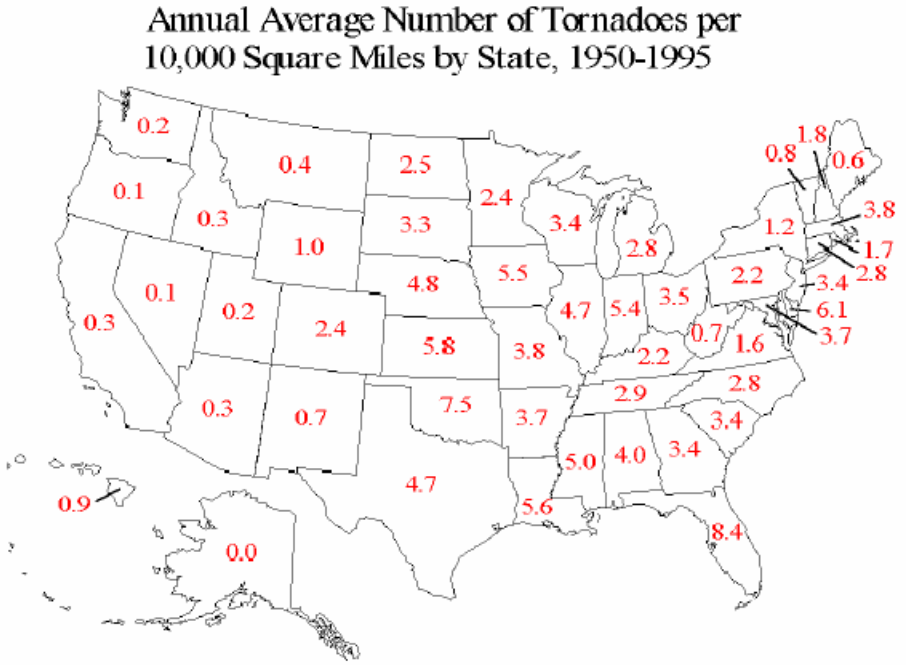

Figure 3-4. Annual Number of Tornadoes per 10,000 Square Miles, by State (NOAA 1999)

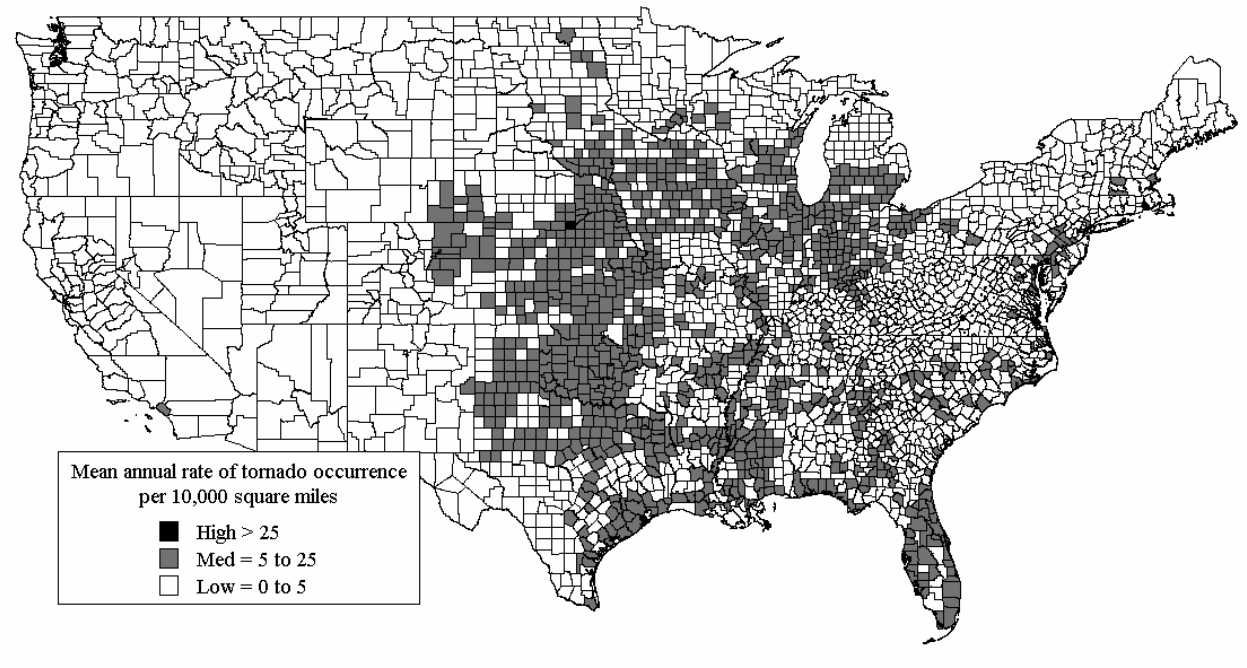

Figure 3-5. Average Annual Number of Observed Tornadoes per 10,000 Square Miles, by County

With these data in mind, this guideline defines high wind hazard as being in a county where the maximum basic wind speed is 120 mph or greater, or in a county whose annual rate of observed tornado occurrence between 1950 and 1995 exceeds 25 per 10,000 square miles, or in a Gulf or Atlantic coastal county whose basic wind speed is 110 mph or greater. Thus, this guideline's definition of high hazard for wind is similar to the IBC's definition of wind-borne debris regions except that it is on a county basis and includes tornado occurrence considerations. (Note that, while this guideline uses NOAA data to determine the frequency of observed tornados, no obvious means has been found to equate tornado hazard with hurricane or straight-line wind hazard). This guideline has, therefore, adopted what appears to be a reasonable method to acknowledge that tornado hazard contributes to overall wind hazard.

Moderate wind hazard is defined as any county that does not qualify as high hazard and whose basic wind speed exceeds 90 mph, or in a county whose annual rate of observed tornado occurrence between 1950 and 1995 exceeds 5 per 10,000 square miles. This guideline's definition of moderate hazard for wind is like the IBC's definition of hurricane-prone regions, except that it is on a county basis and includes tornado occurrence considerations.

Low wind hazard is defined as any county that does not qualify as either high or moderate wind hazard. This guideline does not address ASCE-7-02's special wind regions because these require detailed site information that is beyond the scope of this guideline.

Icing Hazard. In establishing the icing hazard, this guideline uses ASCE 7-02, Minimum Design Loads for Buildings and Other Structures maps. These maps represent 50-year mean recurrence

interval uniform ice thicknesses due to freezing rain. The following assignments were used to define icing hazard levels:

> ***High:*** ≥ 1.0 in.
>
> ***Moderate:*** > 0.25 in. and < 1.0 in.
>
> ***Low:*** ≤ 0.25 in.

*Ice hazard level***.** In establishing the hazard level for ice loads, this guideline uses information contained in ASCE-7-05. Maps contained in ASCE-7-05 show 50-year recurrence interval uniform ice thicknesses due to freezing rain with concurrent 3-second gust speeds. Ice thicknesses are shown in inches. Figures 3-6 shows an ice maps for the contiguous U.S. Based upon this map, this guideline assumes high hazard areas correspond to those regions with ice thicknesses in excess of 1.0 in. In general, these areas include the Northeast, the Lake Superior region, and some parts of the Pacific Northwest. Moderate hazard areas are those regions expected to experience between 0.25 in. and 1.0 in. of ice. Low hazard areas are all areas expected to experience less than 0.25 in. of ice.

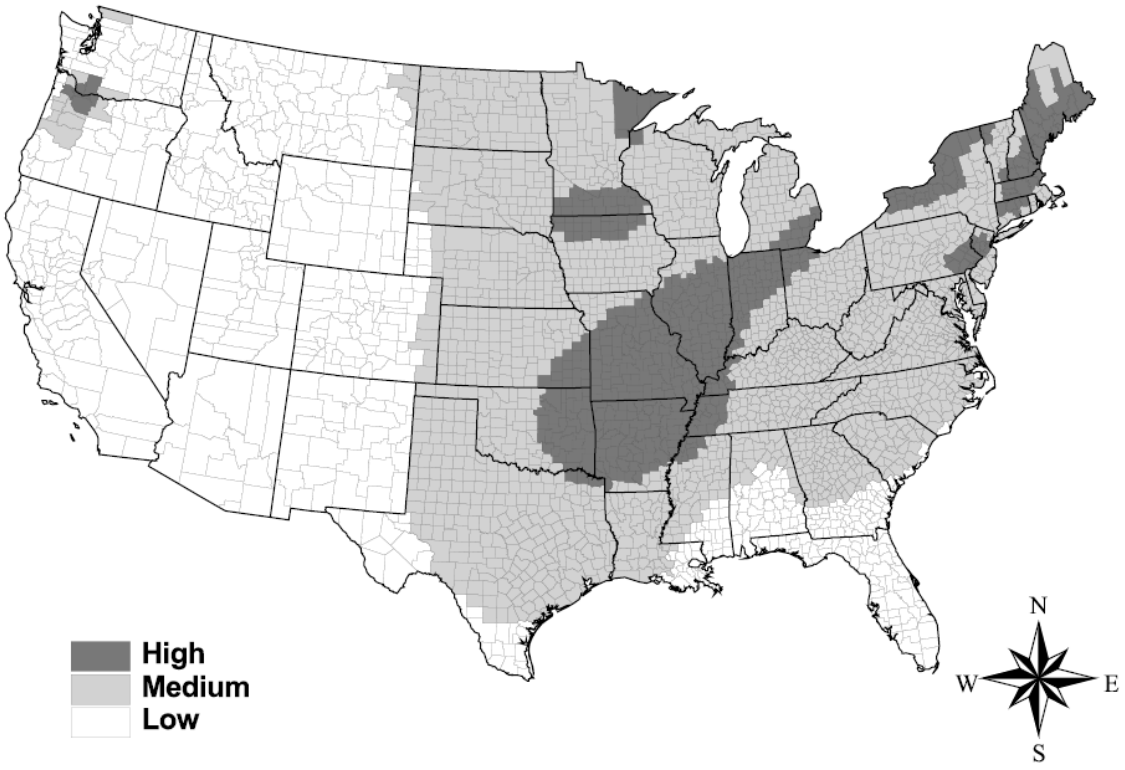

Figure 3-6. 50-Year Recurrence Interval Uniform Ice Thicknesses – Contiguous U.S. (ASCE-7-05 2005)

Flooding Hazard. The classification of counties for flood hazards is based on whether Q3 data are available for that county. Q3 data are GIS files that contain information on flood areas as mapped by the FEMA Flood Insurance Rate Maps (FIRM). The Q3 maps cover 1,332 counties out of 3,141. "Q3" in Appendix A indicates Q3 data are available for the county, and "NOQ3" indicates that Q3 are not available. The Q3 maps were produced to support disaster recovery operations and are not officially recognized as a substitute for determining flood hazard from paper FIRM maps, largely due to map registration issues. Because the Q3 data are used in disaster recovery, counties with Q3 mapped generally correspond to areas with greater flood risk (see "Q3 Flood Data User's Guide" FEMA 1996; http://msc.fema.gov/q3users.shtml).

This guideline assumes that if data are available, then there is at least a 100-year floodplain mapped somewhere in that county. In this case, no distinction is made between low, moderate, or high hazards. If a Q3 map is available for that county, it was assumed that there is at least a moderate flood hazard level for that area. The user should be aware, however, that lack of a Q3 map does not imply the nonexistence of a flood hazard. If a "local" flood hazard is known to exist for the area under investigation despite the absence of a Q3 map, then the assessment should be upgraded to a Phase 2 evaluation. Therefore, the following assignments are used in gauging flood hazard levels:

> ***Moderate/High***: Q3 map available for county
>
> ***Low***: Q3 map does not exist for county

Human Threats. The time-dependent nature of human threat levels has been considered in developing the criteria for hazard or threat level. In particular, the hazard criteria is based on ES-ISAC Orange (High) and Red (Severe) threat alert levels. With these separation points, the high hazard level is based on the existence of specific, credible information about a human threat against the electric industry. The moderate hazard level is based on Blue (Guarded) and Yellow (Elevated) threat alert levels. This selection is based on nonspecific, general information about the potential for a human-caused disruption of service. The low hazard level is based on the ES-ISAC Green (Low) threat alert level. This level is based on the existence of no known threats to the power industry other than normal human activities, which are generally tracked through reporting systems established by State Public Utilities Commissions.

> ***High***: ES-ISAC-Orange (High) to Red (Severe)
>
> ***Moderate***: ES-ISAC-Blue (Guarded) to Yellow (Elevated)
>
> ***Low***: ES-ISAC-Green (Low)

Human threat level. Human threats by their very nature evolve from adversaries or events that can disrupt electric power systems. This evolutionary process occurs over time. Law enforcement analyst or security specialists rely on information or data obtained from research or interviews gathered over time to form an opinion about general or specific threats. This

information or data are referred to as intelligence and comes from such diverse sources as criminals, business competitors, hackers, foreign intelligence services, terrorists, and others.[1] Intelligence may come from open (published information or information from various news media) sources. In general, intelligence is treated as confidential information to avoid discovery by adversaries in an attempt to apprehend them before they have the chance to launch attacks. Intelligence is generally shared only on a need-to-know basis. As such, the quantity and quality of specific intelligence about a human threat (or conversely the lack of specific information about the potential for human threats) are not very useful for determining the appropriate level of investigation.

When short-term periods of intense politically motivated protests take place, however, the infrastructure community can expect that it may be attacked, regardless of its involvement in the event being protested. Protesters often view regulated utility companies, such as electric power companies, as part of the government, regardless of whether they are an investor-owned or a publicly owned utility. Even protests between two foreign nations can spill over into the United States, because the United States is a multicultural nation with a large global presence.[2]

As a result of the national aspect of human threats, the federal government has long been involved in developing intelligence through multiple law enforcement and intelligence agencies and coordinating that information dissemination with state and local government agencies. Following the President's Commission on Critical Infrastructure Protection in 1997 and the President's Decision Directive 63 in 1998, the Secretary of the U.S. Department of Energy requested the North American Electric Reliability Council (NERC) to accept the role as Electric Sector Coordinator for Critical Infrastructure Protection. NERC established voluntary procedures for implementing information reporting, analysis and warning provisions of the National Infrastructure Protection Center's (NIPC) national level Indications, Analysis & Warning (IAW) program. Within the IAW program, NERC developed the Electric Sector–Information Sharing and Analysis Center (ES-ISAC).[3]

It is the mission of ES-ISAC to receive information for analysis by governmental agencies, provide analytical support to the NIPC and other agencies in the interpretation of information about the Electric Sector, and disseminate threat indications, analyses, and warnings together with interpretations to assist the Electric Sector. As part of this mission, the NERC sponsored ES-ISAC has developed color-coded threat alert levels in a similar fashion to the Department of Homeland Security Threat Alert Levels. The threat levels are divided into physical and cyber threat alert levels. Physical threat alert levels can be issued for the entire nation, a specific region, city, and facility type.[4] Cyber threat alert levels can be issued for a specific computer

[1] National Infrastructure Protection Center, "Risk Management: An Essential Guide to Protecting Critical Assets," November 2002.
[2] NIPC; same as above.
[3] Leffler, Louis G., "Testimony to the United States House of Representatives, Committee on Government Reform, Subcommittee on Government Efficiency, Financial Management and intergovernmental Relations, Discussing Activities Undertaken by the Electricity Sector to Address Physical and Cyber Security with Emphasis on the Electricity Sector – Information Sharing and Analysis Center," July 24, 2002.
[4] NERC, "Threat Alert System and Physical Response Guidelines for the Electricity Sector," Version 2.0, October 8, 2002.

platform or a communications protocol or service, such as Windows 2000 or SCADA Communications.[5] Current definitions of human threats are provided in Table 3-1.

The temporal dependent nature of human threats has been considered in the definition of human threat levels. The high hazard level is based on ES-ISAC Orange (High) and Red (Severe) threat alert levels. The high hazard level is based on the existence of specific, credible information about a human threat against electric power companies. The moderate hazard level is based on Blue (Guarded) and Yellow (Elevated) threat alert levels. This selection is based on nonspecific, general information about the potential for a human-caused disruption of system function. Since the ES-ISAC threat alert levels were developed after the September 11, 2001, terrorist attack on the World Trade Center, the threat alert levels have not fallen below Yellow (Elevated) or gone above Orange (High), which seems appropriate for the evaluations of the performance of utility systems that have been conducted with respect to human threat events since that time. The low hazard level is based on the ES-ISAC Green (Low) threat alert level, which implies a general absence of threats against electric power companies other than normal human activities, which are generally tracked through reporting systems established by the various State Public Utilities Commissions.

[5] NERC, "Threat Alert System and Cyber Response Guidelines for the Electricity Sector," Version 2.0, October 8, 2002.

Table 3-1. Human Threat Definitions

Physical	Cyber
ES-Physical-Green (Low) ES-Physical GREEN applies when no known threat exists of terrorist activity or only a general concern exists about criminal activity, such as vandalism, which warrants only routine security procedures. Any security measures applied should be maintainable indefinitely and without adverse impact to facility operations. This level is equivalent to normal daily operations.	**ES-Cyber-GREEN (Low)** ES-Cyber-GREEN condition applies when there is no known threat of cyber attack or only a general concern about hacker activity that warrants only routine security procedures. Any cyber security measures applied should be maintainable indefinitely and without adverse impact to business or expenses. This may be equivalent to normal daily conditions.
ES-Physical-Blue (Guarded) ES-Physical BLUE applies when a general threat exists of terrorist or increased criminal activity with no specific threat directed against the electric industry. Additional security measures are recommended, and they should be maintainable for an indefinite period with minimum impact on normal facility operations.	**ES-Cyber-BLUE (Guarded)** ES-Cyber-BLUE condition applies when there is a general threat of increased cyber (hacker intrusions, viruses, etc.) activity with no specific threat directed toward the electric industry. Additional cyber security measures may be necessary and if initiated they should be maintainable for an indefinite period with minimum impact on normal business or expenses.
ES-Physical-Yellow (Elevated) ES-Physical YELLOW applies when a general threat exists of terrorist or criminal activity directed against the electric industry. Implementation of additional security measures is expected. Such measures are anticipated to last for an indefinite period.	**ES-Cyber-YELLOW (Elevated)** ES-Cyber-YELLOW condition applies when a general threat exists of disruptive cyber activity directed against the electric industry. Implementation of additional cyber security measures is expected. Such measures are anticipated to last for an indefinite period.
ES-Physical-Orange (High) ES-Physical ORANGE applies when a credible threat exists of terrorist or criminal activity directed against the electric industry. Additional security measures have been implemented. Such measures may be anticipated to last for a defined period.	**ES-Cyber-ORANGE (High)** ES-Cyber-ORANGE condition applies when a credible threat exists of disruptive cyber activity directed against the electric industry. Additional cyber security measures have been implemented. Business entities need to be aware that corporate resources will be required above and beyond those required for normal business or expenses.
ES-Physical-Red (Severe) ES-Physical-RED applies when an incident occurs or credible intelligence information is received by the electric industry indicating a terrorist or criminal act against the electric industry is imminent or has occurred. This condition may apply because of an incident in North America outside of the Electricity Sector. Maximum security measures are necessary. Implementation of such measures could cause hardship on personnel and seriously impact facility business and security activities.	**ES-Cyber-RED (Severe)** ES-Cyber-RED condition applies when an incident occurs or credible intelligence information is received by the electric industry indicating a disruptive cyber attack against the electric industry is imminent or has occurred. This condition may apply because of an incident in North America outside of the Electricity Sector. Maximum cyber security measures are necessary. Implementation of such measures could cause hardship on personnel and seriously impact facility business and security activities.

4.0 Annotated References

American Lifelines Alliance (ALA). 2002a. Development of Guidelines to Define Natural Hazards Performance Objectives for Water Systems, vol. 1, September, www.americanlifelinesalliance.org

This document provides detailed guidelines for evaluating water systems subjected to natural hazard threats.

_____. 2002b. Development of Guidelines to Define Natural Hazards Performance Objectives for Water Systems, vol. 2, September, www.americanalliance.org

This document provides a detailed commentary to the aforementioned Volume 1 report.

American Society of Civil Engineers (ASCE). 2005. Minimum Design Loads for Buildings and Other Structures (ASCE 7-05). Reston, Va.: American Society of Civil Engineers. Structural Engineering Institute.

This ASCE standard specifies dead, live, flood, wind, snow, rain, seismic, and ice loads for structures.

_____. 2003b, Seismic Evaluation of Existing Buildings (ASCE/SEI 31-03).

This ASCE standard provides detailed procedures for the evaluation of existing buildings and building equipment, replacing FEMA 310.

Applied Technology Council (ATC). 2002. *Rapid Visual Screening of Buildings for Potential Seismic Hazards–A Handbook* (FEMA 154), 2nd ed. Washington, D.C.: Federal Emergency Management Agency.

The report contains guidelines for performing rapid safety inspections of buildings after large earthquakes.

Building Seismic Safety Council. 2001. *NEHRP Recommended Provisions for Seismic Regulations for New Buildings and Other Structures* (2000 edition, FEMA 368). Washington, D.C.: Federal Emergency Management Agency, pp. 374.

Seismic provisions in this document used as a basis for seismic provisions in 2000 International Building Code and ASCE 7-98 Standard.

Chang, S.E., H.A. Seligson, and R.T. Eguchi. 1995. "Estimation of Economic Losses Caused by Disruption of Lifeline Service," in *Lifeline Earthquake Engineering: Proceedings of the Fourth U.S. Conference,* ed. by M. J. O'Rourke. New York: American Society of Civil Engineers, Technical Council on Lifeline Earthquake Engineering Monograph No. 6, pp. 48–55.

This paper provides a scenario-based evaluation of regional losses to Memphis Gas and Light.

Cornell, A. 1968. "Engineering Seismic Risk Analysis," *Bulletin of the Seismological Society of America* 68 (1): pp. 1583–1606.

This paper is one of the pioneering works in earthquake risk analysis. Its applications are primarily to site-specific cases, such as buildings or individual components in a system.

Electric Power Research Institute (EPRI). 2002. Security Vulnerability Self-Assessment Guidelines for the Electric Power Industry. December.

Guidelines for assessing power system vulnerabilities, especially from human threats.

Federal Emergency Management agency (FEMA). 1994. Reducing the Risk of Nonstructural Earthquake Damage–A Practical Guide (FEMA 74). September.

This guide presents examples of nonstructural earthquake damage, mitigation techniques, and their costs. The costs are somewhat outdated.

_____. 1996. Q3 Flood Data User's Guide. http://msc.fema.gov/q3users.shtml.

Documents the use of flood hazard maps published by the Federal Emergency Management Agency.

_____. 1997. Multihazard Identification and Risk Assessment: A Cornerstone of the National Mitigation Strategy.

Milestone plan published by FEMA to address all natural hazards.

_____. 2000. Pre-standard and Commentary for the Seismic Rehabilitation of Buildings (FEMA 356). November.

Report that describes guidelines for rehabilitating or retrofitting seismically deficient buildings.

_____. 2002a. Integrating Human-Caused Hazards into Mitigation Planning (FEMA 386-7). September.

General guidelines for considering actions for mitigating human threats.

_____. 2002b. *Rapid Visual Screening of Buildings for Potential Seismic Hazards–A Handbook* (FEMA 154 / 155), 2nd ed. Redwood City, Calif.: Applied Technology Council (ATC).

Contains procedures for performing post-earthquake safety inspections. Currently serves as a major tool in many state and local building and planning departments.

_____. 2003a. HAZUS MH Manual. See also http://www.fema.gov/hazus/or www.hazus.org.

The report provides guidance to individuals implementing HAZUS multi-hazard (MH). Currently addresses earthquake, wind and flood.

_____. 2003b. *Reference Manual to Mitigate Potential Terrorist Attacks Against Buildings* (FEMA 426). June.

Guideline to identify potential human threats to buildings and possible mitigative actions.

Frankel, A.D., C.S. Mueller, T.P. Barnhard, E.V. Leyendecker, R.L. Wesson, S.C. Harmsen, F.W. Klein, D.M. Perkins, N.C. Dickman, S.L. Hanson, and M.G. Hopper. 2000. USGS National Seismic Hazard Maps, *Earthquake Spectra* 16 (1): 1-19.

This paper provides further clarification and ongoing updates to the 1996 Frankel et al. seismic hazard maps and documentation.

International Conference of Building Officials (ICBO). 1997. *Uniform Building Code.* Whittier, Calif.: International Conference of Building Officials .

Basic reference for building design and construction.

International Code Council (ICC). 2002. *International Building Code 2003*.

This code is based on the seismic provisions in the Building Seismic Safety Council (2001), FEMA 368 publication. The preceding edition in 2000 replaced the 1997 Uniform Building Code.

Institute of Electrical and Electronics Engineers, Inc (IEEE). 1997. Recommended Practices for Seismic Design of Substations (IEEE 693).

This is an earthquake qualification standard for electric power components that is written by individuals representing the utility, testing and manufacturing industries and academia. The standard provides an earthquake qualification approach that the four stakeholder groups support.

Matsuda, E.N., W.U. Savage, K.K. Williams, and G.C. Laguens. 1991. "Earthquake Evaluation of a Substation Network," *Lifeline Earthquake Engineering: Proceedings of the Third U. S. Conference*, ed. Michael A. Cassaro. New York: American Society of Civil Engineers, pp. 295–317.

This paper provides a method for ranking substations in terms of the aggregate system effects of earthquake scenarios and in order to improve earthquake pre- and post-disaster activities.

McCalpin, J.P., ed. 1996. *Paleoseismology* 62. New York: International Geophysics Series, Academic Press.

This book provides a summary of techniques and methods used in field studies to estimate the location, timing, and size of prehistoric earthquakes. All contributors to the book are active field researchers that have had a role in developing the techniques presented. The book relies on many case histories to illustrate the application of techniques that are currently accepted as routine as well as techniques that are evolving with the field of paleoseismology.

McGavin, G.L.. 1981. Earthquake Protection of Essential Building Equipment. Hoboken, N.J.: John Wiley & Sons.

This comprehensive guide discusses seismic qualification of building service equipment, and shows anchorage and bracing techniques for mitigation of earthquake damage. The codes and specifications cited are somewhat outdated.

McGuire, R. K.. 1990. "Effects of Uncertainties in Component Fragilities on Lifelines Seismic Risk Analysis," in *Recent Lifeline Studies,* ed. by Anne S. Kiremidjian. New York: American Society of Civil Engineers, Technical Council on Lifeline Earthquake Engineering Monograph No. 1, pp. 14–22.

This paper provides a procedure for a full seismic risk evaluation of lifeline networks. Contains the seeds of a "covariance matrix" procedure that has since been adapted in catastrophe insurance modeling as a means (with some loss of information) to reduce computer times for catastrophe insurance evaluations.

Moghdaderi-Zadeh, M. 1992. "Earthquake Loss Analysis for Lifelines," in *Lifeline Earthquake Engineering: Proceedings of the Third U. S. Conference*, ed. Michael A. Cassaro. New York: American Society of Civil Engineers, pp. 661–72.

This paper provides a general outline of how to undertake a full simulation evaluation of a lifeline network.

Multidisciplinary Center for Earthquake Engineering Research (MCEER). 1999. *Proceedings of the Seventh U.S.-Japan Workshop on Earthquake Resistant Design of Lifeline Facilities and Countermeasures Against Soil Liquefaction*, ed. T. O'Rourke, J. Bardet, and M. Hamada. Buffalo, N.Y.: MCEER.

Workshop proceedings contain numerous papers that focus on the assessment of liquefaction hazards and their effects on distributed lifeline systems. This report is part of a series that started over 10 years ago.

National Infrastructure Protection Center. 2002. Risk Management: An Essential Guide to Protecting Critical Assets.

Information developed for the electric power industry on responding to terrorist and other human threats.

National Research Council. 1985. *Liquefaction of Soils during Earthquakes.* Washington, D.C.: National Academy Press.

This report summarizes the state-of-the-art in seismically induced liquefaction studies as of 1985.

North American Electric Reliability Council (NERC). 2002a. Threat Alert System and Cyber Response Guidelines for the Electricity Sector, version 2.0. October 8.

_____. 2002b. Threat Alert System and Physical Response Guidelines for the Electricity Sector, version 2.0. October 8.

National Oceanographic and Atmospheric Administration (NOAA). 1999. Tornado Data Archive.

Tornado database for the U.S.

Nyman, D. J., D. G. Honegger, and P. C. Thenhaus. 2003. "Considerations for the Design of Buried Natural Gas and Liquid Hydrocarbon Pipeline Fault Crossings," in *Proceedings of the 6th U.S. Conference on Lifeline Earthquake Engineering (Advancing Mitigation Technologies and Disaster Response).* Long Beach, Calif.: TCLEE, ASCE, pp. 744–56.

This paper presents a summary of state-of-the-art practice for the analysis and design of fault crossings for buried natural gas and liquid hydrocarbon pipeline systems. It covers the investigation of fault crossing hazards, presents a strain-based analysis and design methodology, and identifies key areas of uncertainty that affect determination of fault crossing design margins.

Ostrom, D.K.. 2003. "SERA II," in *Proceedings of the 6th U.S. Conference on Lifeline Earthquake Engineering (Advancing Mitigation Technologies and Disaster Response).* Long Beach, California. ICLEE, ASCE, pp 587-596.

This paper describes the reevaluation of earthquake risk for a major electric utility system. The purpose of this paper was to address several key issues raised in an American Power Conference Paper "Seismic Risk Assessment for a Utility System." This paper presents the performance of a system risk assessment from the perspective of the utility.

Ostrom, D.K., and G.J. Gould. 1986. "Seismic Risk Assessment for a Utility System," in *Lifeline Seismic Risk Analysis—Case Studies*, ed. R.T. Eguchi. New York: American Society of Civil Engineers, pp. 88–92.

This early work by the principal author focuses on the monetary risks that earthquakes pose to electric utilities. The publication develops a simple relationship between the performance of electric system components at the facility level and earthquake hazard. The final assessment is presented in terms of monetary risk.

Ostrom, D.K., Burhenn, T.A., Hawkins, H.G., Richau, E.M. 1992. "The Earthquake Vulnerability of a Utility System," in *Proceedings of the American Power Conference*, v. 54-1, pp. 224–27.

This paper presents a System Earthquake Risk Assessment (SERA) of an electric utility system. The paper discusses how to model the system, especially the return to service of the electric utility system. The approach is based on developing statistically compatible system states using Monte Carlo simulations on a component level. Component fragilities are based on performance data from past earthquakes.

Perkins, D., and C. Taylor, 2003, "Earthquake Occurrence Modeling for Evaluating Seismic Risks to Roadway Systems," in *Advancing Mitigation Technologies and Disaster Response for Lifeline "Systems: Proceedings of the Sixth U. S. National Conference on Lifeline Earthquake Engineering,"* ed. by James E. Beavers. Reston, Va: American Society of Civil Engineers, Technical Council on Lifeline Earthquake Engineering Monograph No. 25, pp. 859–67.

This paper provides potential efficiencies in modeling systems probabilistically relative to earthquake threats.

Ponist, R. 2003. "Transmission and Distribution – How to Assess Transmission Line Security," www.elp.com, August.

Article that introduces simulation software for assessing the reliability of electric power systems to human threats.

Power, M.S., and Holzer, T.L. 1996. Liquefaction Maps: Applied Technology Council (ATC TechBrief 1).

This technical brief presents a listing of maps of liquefaction for many urban areas throughout the U.S. and Puerto Rico.

Rose, A. 1999. "Computable General Equilibrium Modeling of Earthquakes," in *Optimizing Post-Earthquake Lifeline System Reliability: Proceedings of the Fifth U.S. Conference*, ed. William M. Elliott and Peter McDonough. Reston, Va: American Society of Civil Engineers, Technical Council on Lifeline Earthquake Engineering Monograph No. 16, pp. 612–20.

This paper provides an account of the general features of a method used to evaluate regional losses to lifelines systems as a result of earthquake disruption.

Sandia National Laboratory. 2002. Risk Assessment Methodology for Transmission (RAM-T). January.

Reference that discusses proprietary software to analyze the reliability of electric power systems from human threats.

Scawthorn, C., ed. 1986. Techniques for Rapid Visual Assessment: New York: American Society of Civil Engineers (ASCE).

This ASCE monograph presents a series of papers discussing rapid visual assessment techniques. It provides some good background to later developments such as FEMA 154 (2002).

Seligson, H.A., Eguchi, R.T., Tierney, K.J., and K. Richmond. 1996. *Chemical Hazards, Mitigation and Preparedness in Areas of High Seismic Risk: A Methodology for Estimating the Risk of Post-Earthquake Hazardous Materials Release* (Technical Report NCEER-96-0013). November 7, 1996.

This report provides a methodology for determining public exposure to hazardous materials release in an earthquake. The methodology is applied to the southern California area. Release of chlorine and ammonia are studied. Fragility models for chemical processing equipment are also included in this report.

Shinozuka, M., and H.H.M. Hwang. 1998. "Seismic Performance of Electric Power Systems," pp. 33-44 in *Engineering and Socioeconomic Impacts of Earthquakes*. Buffalo, N.Y.: Multidisciplinary Center for Earthquake Engineering Research, MCEER Monograph Number 2.

This paper provides a scenario-based method to the assessment of electric power system.

Synolakis, C. 2003. "Tsunami and Seiche" in *Earthquake Engineering Handbook.* Boca Raton, Fla.: CRC Press.:

This chapter discusses historical tsunamis and presents the theory for tsunami and seiche generation and inundation.

Taylor, C.E., S.D. Werner, and S. Jakubowski. 2001. "The Walkthrough Method for Catastrophe Decision-Making," in *Natural Hazards Review* (November). Also anthologized in *Vulnerability and Protection of Infrastructure Systems: The State of the Art.* Reston, Va.:American Society of Civil Engineers, 2002.

This paper provides a full Monte Carlo time-series approach to the evaluation of lifeline systems subjected to natural catastrophes. Advances on this paper are found in Perkins and Taylor (2003).

U.S. Geological Survey (USGS). 1996a. *National Seismic Hazard Maps, June 1996 Documentation* (Open-File Report 96-532), pp. 110.

This document provides documentation for the U. S. seismic probabilistic hazard maps that have been in effect until 2002.

_____. 1996b. *Probabilistic Seismic Hazard Assessment for the State of California* (California Geological Survey, Open-File Report 98-08, pp. 66; USGS Open-File Report 96-706, pp. 66).

This report summarizes efforts at the California Geological Survey consistent with those produced by Frankel et al. (see 1996, 2002).

_____. 1997a. *National Landslide Map for the Conterminous United States* (Open-File Report 97-289).

Map showing the locations of significant landslide hazards for the U.S.

_____. 1997b. *National Seismic Hazard Maps* (Open-File Report 97-131).

Seismic hazard maps for the U.S. Uses different ground-motion indices and return periods to define hazard level

_____. 1998. *A Method for Producing Digital Probabilistic Seismic Landslide Hazard Maps: An Example from the Los Angeles, California, Area* (Open File Report 98-113).

This report uses geologic and ground-motion data from the 1994 Northridge, California, earthquake to construct a general model of permanent ground displacement based on the Newmark sliding-block theory of coseismic displacement on slopes.

_____. 2002. *Documentation for the 2002 Update of the National Seismic Hazard Maps*, (Denver, Colo., Open-File Report 02-420).

This report documents the 2002 update to the 1996 national probabilistic seismic hazard maps produced by Frankel et al.

Wong, I. et al. 2002. "A Comprehensive Seismic Vulnerability and Loss Evaluation of the State of South Carolina Using HAZUS: Part I Overview and Results," in *Proceedings of the 7th National Conference on Earthquake Engineering*, Boston: Earthquake Engineering Research Institute..

This paper describes how this comprehensive study was conducted for the state of South Carolina, using HAZUS. It included both buildings and lifelines and used detailed, customized ground motions, geology, exposure, and vulnerability data to greatly improve the accuracy of the results compared to default HAZUS databases.

Youngs, R.R., et al. 2003. A Methodology for Probabilistic Fault Displacement Hazard Analysis (PFDHA), *Earthquake Spectra* 19 (1): 191–219.

This paper provides method to conduct a site-specific probabilistic analysis of fault displacement hazard.

5.0 Acronym List

ALA	American Lifelines Alliance
ASCE	American Society of Civil Engineers
ATC	Applied Technology Council
BLM	Bureau of Land Management
CB	Circuit Breaker
CIA	Central Intelligence Agency
CPT	Cone Penetration Tests
DHS	Department of Homeland Security
DOE	Department of Energy
DOT	Department of Transportation
DT	Dead Tank
FBI	Federal Bureau of Investigation
EPA	Environmental Protection Agency
FEA	Finite-Element Analysis
FEMA	Federal Emergency Management Agency
FERC	Federal Energy Regulatory Commission
FLAC	Fast Lagrangian Analysis of Continua
GIS	Geographic Information Systems
HAZUS	Hazards U.S.
HEC RAS	Hydrologic Engineering Center, River Analysis System
IBC	International Building Code
LT	Live Tank
MCEER	Multidisciplinary Center for Earthquake Engineering Research
MMC	Multihazard Mitigation Council
NEHRP	National Earthquake Hazards Reduction Program
NIPC	National Infrastructure Protection Center
NOAA	National Oceanographic and Atmospheric Administration
NIBS	National Institute of Building Sciences
NRC	Nuclear Regulatory Commission
NWS	National Weather Service
PEER	Pacific Earthquake Engineering Research Center
PSHA	Probabilistic Seismic Hazard Analysis
PWHA	Probabilistic Wind Hazard Analysis
QT	Qualification Testing
RFP	Request for Proposal
SERA	System Earthquake Risk Assessment
SCADA	Supervisory Control and Data Acquisition
SPT	Standard Penetration Tests
TR	Transformer
TSA	Transportation Security Administration
USGS	U.S. Geological Survey

6.0 Terms and Definitions

Acceleration. The rate of change of velocity. As applied to strong ground motions, the rate of change of earthquake-shaking velocity of a reference point. Commonly expressed as a fraction or percentage of the acceleration due to gravity *(g),* wherein $g = 980$ cm/s^2.

Accuracies. This guideline refers to two types of accuracy—relative and absolute. *Relative accuracy* refers to precision relative to some baseline condition or among different parameters. That is, the relative accuracy of ground motion prediction is high compared to our ability to predict earthquakes. *Absolute accuracy* usually refers to some specific determination of how accurate a particular number is. For example, our estimate of ground motion is 0.5 g, plus or minus 0.1 g.

Active Fault. An earthquake fault that is likely to undergo renewed movement within a time period of concern to society. Faults are commonly considered to be active if they have slipped one or more times in the last 10,000 to 11,000 years, but they may also be considered potentially active when assessing the hazard for some applications even if movement has occurred in the last 500,000 years. See **Fault.**

Analysis Level 1. Level 1 is designed to provide a preliminary estimate of hazard, vulnerability, or system performance. This analysis can usually be completed within a matter of days and, in most cases, can be completed by operations and engineering staff. The results are considered uncertain by a factor of 2 or 3 or more and should be used to scope out the extent of the problem in order to decide whether more detailed studies are needed. If the results from this level of analysis do not meet the objectives of the inquiry, then a higher level of analysis (Level 2) should be used.

Analysis Level 2. Level 2 is characterized as a more quantitative analysis, often depending on data from the field and historical or statistical information to quantify hazard, vulnerability, and system performance. This level is typically completed within a matter of weeks rather than months or years and could be performed by operations and engineering staff with possible assistance from technical specialists. The accuracy of the results is better than approximate, often providing quantitative results within a factor of 2 or 3. If further detail or precision is required, then a Level 3 analysis is indicated.

Analysis Level 3. Level 3 represents the highest level of analysis that can be performed. It is quantitative with results accurate to the state-of-the-practice. This level is characterized by better and more complete data, the use of more advanced methodologies or tools (e.g., proprietary software), and will generally require the participation of technical specialists. Level 3 analyses often require extensive fieldwork and generally take months or even years to complete.

ASCE 7. Specifications for minimum design loads for buildings and other structures. Issued by the American Society of Civil Engineers.

Attenuation. The rate at which seismic, wind, or water intensities decrease with distance from their sources or shoreline landing points.

Blizzard. A combination of heavy snowfall, high winds, extreme cold, and ice storms (FEMA 1997).

Cells. As used in this guideline, cells refer to groups or organizations that participate in "war gaming" or simulations. A red cell is the group that is being tested or responding to incidents; a white cell is the facilitating group (i.e., providing information and facilitating communication).

Coastal Erosion. A hydrologic hazard defined as the wearing away of land and loss of beach, shoreline, or dune material as a result of natural coastal processes or manmade influences (FEMA 1997). A hydrologic hazard defined as the eroding of land and loss of beach or shoreline as a result of natural processes or manmade influences (9/19/01 by LeVal Lund).

Component Damage Algorithm or Model. A procedure or function for estimating damage to a component subjected to a natural hazard event.

Component Downtime Model. A component vulnerability model or function relating the degree of downtime for the component as a function of its damage state. Can be combined with a **component damage model** to produce a model relating downtime to hazard severity.

Component Fragility Curve. A mathematical expression, represented graphically as a curve, that relates the probability of a component reaching or exceeding a particular damage state, given a specific level of a hazard.

Component Loss Algorithm or Model. A component damage algorithm or model in which component repair costs are the defined damage states.

Damage. Physical disruption, such as cracking in walls or overturning of equipment (often used synonymously, but erroneously, with **Loss**).

Deaggregation Methods. A mathematical technique for attributing seismic hazard results (probabilistic ground motion estimates) to earthquake source and locational parameters. By utilizing this technique, analysts can identify those earthquake faults and return periods that contribute most to the estimate of probabilistic ground motions for a site or region.

Deterministic. A method of engineering and decision-making evaluation based solely on the selection of a few natural hazards events used as scenarios. For instance, a previous flood may be used as the basis for a scenario evaluation of what would happen if that flood reoccurred.

Earthquake. A sudden ground motion or trembling caused by an abrupt release of accumulated strain acting on the tectonic plates that comprise the earth's crust (FEMA 1997). A sudden motion or trembling in the earth caused by the abrupt release of slowly accumulated strain.

Earthquake Hazard. The representation of an earthquake hazard can cover ground shaking, response spectra (peak spectral acceleration, peak spectral velocity, peak spectral displacement), peak ground velocity, **peak ground acceleration,** duration of significant shaking, time-history evaluation, and/or permanent ground deformation including fault offset.

Exposure. The number, types, qualities, and monetary values of various types of property or infrastructure, life, and environment that may be subject to an undesirable or injurious hazard event.

Exposure Period. The period of time over which risk is to be computed; the period of time over which a facility or population at risk is subjected to a hazard.

Fault. A fracture along which there has been significant displacement of the two sides relative to each other parallel to the fracture. *Strike-slip faults* are predominantly vertical fractures along which rock masses have mostly shifted horizontally. If the block opposite an observer looking across the fault moves to the right, the slip style is termed right-lateral; if the block moves to the left, the motion is termed left-lateral. *Dip-slip faults* are inclined fractures along which rock masses have mostly shifted vertically. If the rock mass above an inclined fault is depressed by slip, then the fault is termed *normal;* whereas, if the rock above the fault is elevated by slip, then the fault is termed *thrust* (or *reverse*). *Oblique-slip faults* have significant components of both slip styles.

Fault Rupture. The differential movement of two landmasses along a fault. A concentrated, permanent deformation that occurs along the **fault trace** and caused by **slip** on the fault.

Flooding. The accumulation of water within a water body and the overflow of excess water onto adjacent floodplain lands. A rising body of water (as in a stream, lake, or sea, or behind a dam) that overtops its natural or artificial confines and that covers land not normally under water; esp. any relatively high stream flow that overflows its banks in any reach of the stream or that is measured by gage height or discharge quantity.

Flood-coastal. Abnormally high water on open and semi-enclosed bodies of water resulting from **storm surge** and **tsunami,** precipitation, tide, wind-wave activity, and possible flood at nearby stream.

Floodplain. The land adjoining the channel of a river, stream, ocean, lake, or other watercourse or water body that is susceptible to flooding.

Flood-river. Abnormally high water on an inland stream resulting from precipitation and snowmelt runoff, possible ice blockage, wind-wave activity, and possible dam failure or stream diversion.

Fragility. See **Vulnerability Model.**

Frequency. See **Probability and Frequency.**

Frost Heave, Frost Heaving. The uneven lifting or upward movement and general distortion of surface soils, rocks, vegetation, and structures such as pavements due to subsurface freezing of water and growth of ice masses (esp. ice lenses); any upheaval of ground caused by freezing.

Geohazard. See **earthquake hazard, landslide, ground failure,** and **frost heave.**

GIS. GIS is an acronym for geographic information system. This describes a geospatial technology that allows the user to correlate or tie different sets together by having common geographic coordinates.

Graphic Methods. Methods that allow easy overlay of hazard and system information. Usually, these methods are facilitated using some type of GIS system or tool. By overlaying power system maps onto hazard maps (e.g., location of liquefiable areas, flood hazard zones, or extreme wind areas), a user can make a quick and simple assessment of whether the system is at risk.

Ground Failure. A general reference to **fault rupture, liquefaction, landsliding,** and **lateral spreading** that can occur during an earthquake or other land movement causes.

Ground Shaking. A general term referring to the qualitative or quantitative aspects of movement of the ground surface from earthquakes. Ground shaking is produced by **seismic waves** that are generated by sudden **slip** on a fault and travel through the earth and along the surface of the earth.

Hazard. An event or physical condition that has the potential to cause fatalities, injuries, property damage, infrastructure damage, agricultural loss, damage to the environment, interruption of business, or other types of harm or loss (FEMA 1997). A chemical or physical condition that has the potential for causing damage to people, property, or the environment.

Hazard Event Identification. The process of defining the source of a specific hazard, including its magnitude and source location. For modeling events probabilistically, expected frequency of occurrence of the initiating hazard as a function of its severity and location also needs to be modeled.

Hazard Identification. The process of defining and describing a hazard, including its physical characteristics, **magnitude** and severity, **probability and frequency,** causative factors, and locations and areas affected.

Hurricane. A severe **tropical cyclone** with winds exceeding approximately 74 miles per hour, usually originating in the tropical regions of the Atlantic Ocean or Caribbean Sea.

Intensity. A subjective numerical index describing the severity of a hazard in terms of its effects on the ground surface and on people, structures, and the environment.

Landslide. The downward and outward movement of slope-forming earth materials reacting under the force of gravity. The term covers a broad category of events, including mudflows, mudslides, debris flows, rock falls, rock slides, debris avalanches, debris slides, and earth flows. When slopes lose shear strength because of a disturbance such as **ground shaking.**

Land Subsidence. The loss of surface elevation owing to the removal of subsurface support. Settlement of the surface of the ground, usually occurring over a large area, sometimes precipitated by a removal of water or oil.

Lateral Spreads. The landsliding of gentle, water-saturated slopes with rapid fluidlike flow movement caused by **ground shaking** and **liquefaction.** Large elements of distributed, lateral displacement of earth materials.

Liquefaction. A process by which water-saturated soil temporarily loses shear strength due to build up of pore pressure and acts as a fluid. The result can be foundation bearing failure, differential settlement, lateral spreading, or floating of underground components.

Local Seismic Hazards. Earthquake effects (i.e., strong **ground shaking**), inundation (e.g., **tsunami, seiche,** dam failure), various kinds of permanent ground failure (e.g., **fault rupture, liquefaction**), fire or hazardous materials release at the site-specific scale.

Loss. The human or financial consequences of **damage**, such as human death or injury, cost of repairs, or disruption of social, economic, or environmental systems.

Magnitude. A unique measure of an individual earthquake's release of strain energy, measured on a variety of scales, of which the moment magnitude, M_w (derived from **seismic moment**), is often preferred. (See **Richter Scale**.)

Mean. Here, arithmetic mean, the average value in a distribution.

Microzonation. A term that refers to small-scale zoning that incorporates realistic information on local conditions (e.g., soil conditions).

Mitigation. Sustained action taken to reduce or eliminate long-term costs and risks to people and property from hazards and their effects. Mitigation distinguishes actions that have a long-term impact from those that are more closely associated with preparedness for, immediate response to, and short-term recovery from a specific event.

Natural Hazard. In the context of this guideline, a natural phenomenon that has the potential for causing damage to lifeline structures, systems, or components.

Parallel System or Subsystem. A system or subsystem in which there are multiple sources or at least multiple pathways or conduits to service connections. For an antonym, see **series system or subsystem.** An example would be having multiple sources of power generation or multiple transmission lines that can carry power to a particular area.

Peak Ground Acceleration (PGA). The maximum amplitude of recorded acceleration (also termed the ZPA or zero-period acceleration).

Performance Objectives. A range of limiting structural damage and functionality states for a facility or system, given a specific hazard. Very typically, only facility performance objectives are considered. This document emphasizes the application of system performance metrics in the light of **system performance objectives.**

Probabilistic Methods. Scientific, engineering, and financial methods of calculating severities and intensities of hazard occurrences and responses of facilities that take into account the frequency of occurrence as well as the randomness and uncertainty associated with the natural phenomena and associated structural and social response. An example would be the frequency or likelihood of experiencing a certain flood height within a 10-year period.

Probability and Frequency. *Frequency* measures how often an event (including a natural hazard event, a state or condition of a component, or a state or condition of the system) occurs. One way to express expected frequency is the average time between occurrences or exceedances (non-exceedances) of an event. The mean annual rate of occurrence of a hazard parameter within a range of values is another way to express expected frequency of a hazard. *Probabilities* express the change of the event occurring or being exceeded (not exceeded) in a given unit of time. Whereas, probabilities of occurrence cannot exceed 1.0, expected frequencies (for a given time unit) can exceed 1.0. For instance, expected frequencies of auto accidents in Washington, D.C., for a given year are far in excess of 1.0 even though the probability of an auto accident within a given year can only approach very closely 1.0.

Probability of Exceedance. A measure (expressed as a percentage or ratio) of estimation of the chance that an event will meet or exceed a specified threshold (e.g., magnitude, intensity, or loss) within a period of time.

Q3. Flood map data available from FEMA (www.fema.gov). These data indicate where frequent flooding areas occur throughout the U.S.

Recurrence Interval. The average time span between like events (such as large hazard intensities exceeding a particular intensity) at a particular site or for a specific region (also termed return period).

Return Period. See **Recurrence Interval.**

Richter Scale. A system developed by American seismologist Charles Richter in 1935 to measure the strength (or **magnitude**) of an earthquake, indicating the energy released in an event. Owing to limitations in the instrument used (a Wood-Anderson Seismograph) and the waves it measures, this scale has been supplemented by other, more comprehensive measures of earthquake size (often moment magnitude, M_w).

Risk. The chance of adverse consequences. The combination of the expected likelihood and the consequences of incidents that could result from a particular activity.

Risk Assessment. An evaluation of the risk associated with a specific hazard. Quantitative elements of this assessment are defined in terms of **probabilities and/or frequencies** of occurrence and severity of consequences.

Risk Reduction Measures. Those activities that reduce overall the costs and risks associated with specific hazards.

Scenario. A type of event as defined by its natural hazard source parameters. That is, a scenario is defined by the source (the initiating event, e.g., the initial location and its severity expressed in such terms as **magnitude** or wind velocity), which may have many variable consequences dependent on random factors. A simulation is the assessment of these random factors to define specifically the consequences of the specific source event.

Scenario Loss. The loss from one scenario event (given specific values of the random values for other factors not defining the specific scenario).

Seiche. A standing wave oscillation of an enclosed water body that continues, pendulum fashion, after the cessation of the originating force, which may have been either seismic or atmospheric.

Seismicity. The geographic and historical distribution of past historic or future expected earthquakes.

Seismic Waves. A general categorization of motions that originate from the source of an event. These waves can fall into several different groups: body waves and surface waves. Different wave types can affect structures very differently depending upon the frequency of the structure. There are short- and mid-period waves that will generally have a great impact on low- and mid-rise construction; there are long-period waves that will damage tall, flexible structures, like high-rise buildings.

Series System or Subsystem. A system or subsystem that is nonredundant, lacking multiple water sources, and lacking multiple pathways to the service connections or fire hydrants. For an antonym, see **parallel system or subsystem**.

Simulation. The exercise or use of a model to create likely or possible scenarios or events; a simulated event based on modeling.

Simulation Methods. Methods that are especially adaptable for measuring system impacts or effects. Usually requires a detailed characterization of the system (e.g., network model, including detailed information on individual elements) and detailed mapping of hazards for large regions. More applicable to highly netted transmission or distribution systems. This method can be limited using specific scenarios of interest or fully probabilistic (i.e., accounting for all quantifiable uncertainties, including the occurrence of the hazard).

Slip. The relative displacement of formerly adjacent points on opposite sides of a **fault,** measured on the fault surface.

Soil or Rock Slides. Downward displacement along one or more failure surfaces.

Storm Surge. When the water level of a tidally influenced body of water increases above the normal astronomical high tide.

System Performance Metrics. Quantitative measures by which the performance of a system may be evaluated.

System Performance Objectives. See **Performance Objectives.**

System Risk Evaluation. The evaluation of the probabilities of adverse consequences to the system. A more thorough evaluation than merely the evaluation of the system at risk, the severity and likelihood of natural hazards, or the vulnerability of components to natural hazards.

System Vulnerability Evaluation. The evaluation of system performance relative to a small number of selected natural hazard states or scenarios. Generally suitable for emergency planning, but not for financial evaluations that require a **systems risk evaluation.**

System Vulnerability Model. See **Vulnerability Function or Model.**

Tornado. A rapidly rotating vortex or funnel of air extending groundward from a cumulonimbus cloud. A violently rotating column of air pendent from a convective type cloud and nearly always observable as a funnel cloud or tube. Tornadoes have large rotational wind speeds, pressure gradients along their radii and translational movement. A tornado can create structural loadings and has the potential for creating missiles, the characteristics of which depend on the intensity of the tornado.

Tropical Cyclone. A low-pressure area of closed circulation winds that originates over tropical waters. Winds rotate counterclockwise in the Northern Hemisphere (FEMA 1997).

Tsunami. A series of sea or lake waves produced from the displacement of water by either a local or distant submarine earthquake, volcanic eruption, submarine or coastal landslide. A tsunami may cause flooding loss, impact loads from waves or floating debris, or both, and erosion of earth foundations from structures.

Vulnerability Function or Model. A function that relates facility performance (such as damage or failure) to some measure of hazard intensity (e.g., ground motion level).

Windstorms. See **Tornado, Hurricane, Blizzard,** and **Tropical Cyclone.**

Appendix A: Hazard Level Information by State and County

The following descriptors are used for the table in this appendix.

ID: Unique Identification Number
COUNTY: Name of county
STATE: Name of state
FIPS: Federal Information Processing Standard code (state & county)
Earthquake: Whether the county is at "High," "Moderate" (Mod), or "Low" risk of earthquake hazard
Landslide: Whether the county is at "High," "Moderate" (Mod), or "Low" risk of landslide hazard
Wind: Whether the county is at "High," "Moderate" (Mod), or "Low" risk of wind-related hazard
Tornado: Whether the county is at "High," "Moderate" (Mod), or "Low" risk of tornado hazard
Flood: Whether there is existing FEMA Q3 data for the county or not (NOQ3=Q3 Data Not Available; Q3=Q3 Data Available)
Icing: Whether the county is at "High," "Moderate" (Mod), or "Low" risk of atmospheric icing-related hazard

County	State	FIPS	EQ	LS	Wind	Torn	Flood	Icing
Autauga	Alabama	1001	Low	Mod	Mod	Low	NOQ3	Low
Baldwin	Alabama	1003	Low	Low	High	Mod	Q3	Low
Barbour	Alabama	1005	Low	Low	Mod	Low	Q3	Low
Bibb	Alabama	1007	Mod	Mod	Mod	Low	NOQ3	Low
Blount	Alabama	1009	Mod	High	Mod	Mod	NOQ3	Mod
Bullock	Alabama	1011	Low	Low	Mod	Low	NOQ3	Low
Butler	Alabama	1013	Low	Low	Mod	Low	NOQ3	Low
Calhoun	Alabama	1015	Mod	High	Low	Low	Q3	Mod
Chambers	Alabama	1017	Mod	Low	Mod	Low	NOQ3	Mod
Cherokee	Alabama	1019	Mod	High	Low	Low	NOQ3	Mod
Chilton	Alabama	1021	Mod	Mod	Mod	Low	NOQ3	Low
Choctaw	Alabama	1023	Low	High	Mod	Low	NOQ3	Low
Clarke	Alabama	1025	Low	High	High	Low	NOQ3	Low
Clay	Alabama	1027	Mod	High	Mod	Mod	NOQ3	Low
Cleburne	Alabama	1029	Mod	High	Low	Low	NOQ3	Mod
Coffee	Alabama	1031	Low	Low	High	Mod	Q3	Low
Colbert	Alabama	1033	Mod	Mod	Mod	Mod	NOQ3	Mod
Conecuh	Alabama	1035	Low	Low	High	Low	Q3	Low
Coosa	Alabama	1037	Mod	Low	Mod	Low	NOQ3	Low
Covington	Alabama	1039	Low	Low	High	Low	Q3	Low
Crenshaw	Alabama	1041	Low	Low	Mod	Low	NOQ3	Low
Cullman	Alabama	1043	Mod	High	Mod	Mod	NOQ3	Mod
Dale	Alabama	1045	Low	Low	Mod	Mod	Q3	Low
Dallas	Alabama	1047	Low	Low	Mod	Low	Q3	Low
De Kalb	Alabama	1049	Mod	High	Mod	Mod	NOQ3	Mod

County	State	FIPS	EQ	LS	Wind	Torn	Flood	Icing
Elmore	Alabama	1051	Low	Mod	Mod	Low	NOQ3	Low
Escambia	Alabama	1053	Low	Low	High	Low	NOQ3	Low
Etowah	Alabama	1055	Mod	High	Mod	Mod	NOQ3	Mod
Fayette	Alabama	1057	Mod	High	Mod	Mod	NOQ3	Mod
Franklin	Alabama	1059	Mod	Mod	Low	Low	NOQ3	Mod
Geneva	Alabama	1061	Low	Low	High	Low	Q3	Low
Greene	Alabama	1063	Mod	Low	Mod	Low	NOQ3	Low
Hale	Alabama	1065	Mod	Mod	Mod	Low	NOQ3	Low
Henry	Alabama	1067	Low	Low	Mod	Low	Q3	Low
Houston	Alabama	1069	Low	Low	Mod	Low	Q3	Low
Jackson	Alabama	1071	Mod	High	Low	Low	NOQ3	Mod
Jefferson	Alabama	1073	Mod	Mod	Mod	Low	Q3	Low
Lamar	Alabama	1075	Mod	Mod	Low	Low	NOQ3	Mod
Lauderdale	Alabama	1077	Mod	Mod	Low	Low	NOQ3	Mod
Lawrence	Alabama	1079	Mod	High	Low	Low	NOQ3	Mod
Lee	Alabama	1081	Low	High	Mod	Low	NOQ3	Mod
Limestone	Alabama	1083	Mod	Mod	Low	Low	Q3	Mod
Lowndes	Alabama	1085	Low	Low	Mod	Low	NOQ3	Low
Macon	Alabama	1087	Low	High	Mod	Low	NOQ3	Low
Madison	Alabama	1089	Mod	Mod	Low	Low	Q3	Mod
Marengo	Alabama	1091	Low	Mod	Mod	Low	NOQ3	Low
Marion	Alabama	1093	Mod	Mod	Low	Low	NOQ3	Mod
Marshall	Alabama	1095	Mod	High	Low	Low	NOQ3	Mod
Mobile	Alabama	1097	Low	Mod	High	Low	Q3	Low
Monroe	Alabama	1099	Low	Low	High	Low	NOQ3	Low
Montgomery	Alabama	1101	Low	Low	Mod	Low	Q3	Low
Morgan	Alabama	1103	Mod	Mod	Low	Low	Q3	Mod
Perry	Alabama	1105	Mod	Mod	Mod	Low	NOQ3	Low
Pickens	Alabama	1107	Mod	Mod	Mod	Low	NOQ3	Mod
Pike	Alabama	1109	Low	Low	Mod	Mod	NOQ3	Low
Randolph	Alabama	1111	Mod	Low	Mod	Low	Q3	Mod
Russell	Alabama	1113	Low	High	Mod	Low	Q3	Mod
Shelby	Alabama	1117	Mod	Mod	Mod	Low	NOQ3	Low
St Clair	Alabama	1115	Mod	High	Low	Low	Q3	Mod
Sumter	Alabama	1119	Low	Low	Mod	Low	NOQ3	Low
Talladega	Alabama	1121	Mod	High	Mod	Mod	Q3	Low
Tallapoosa	Alabama	1123	Mod	Low	Mod	Low	NOQ3	Low
Tuscaloosa	Alabama	1125	Mod	Mod	Mod	Low	Q3	Mod
Walker	Alabama	1127	Mod	High	Mod	Mod	NOQ3	Mod
Washington	Alabama	1129	Low	High	High	Low	NOQ3	Low
Wilcox	Alabama	1131	Low	Mod	Mod	Low	NOQ3	Low
Winston	Alabama	1133	Mod	High	Low	Low	NOQ3	Mod
Aleutians East	Alaska	2013	High	Low	High	Low	NOQ3	Low
Aleutians West	Alaska	2016	High	Low	High	Low	NOQ3	Low
Anchorage	Alaska	2020	High	Low	High	Low	NOQ3	Low
Bethel	Alaska	2050	Mod	Low	High	Low	NOQ3	Low
Bristol Bay	Alaska	2060	High	Low	High	Low	NOQ3	Low

County	State	FIPS	EQ	LS	Wind	Torn	Flood	Icing
Dillingham	Alaska	2070	Low	Low	High	Low	NOQ3	Low
Fairbanks North Star	Alaska	2090	Mod	Low	Low	Low	Q3	Low
Haines	Alaska	2100	Low	Low	High	Low	NOQ3	Low
Juneau	Alaska	2110	Low	Low	High	Low	NOQ3	Low
Kenai Peninsula	Alaska	2122	High	Low	High	Low	NOQ3	Low
Ketchikan Gateway	Alaska	2130	Low	Low	High	Low	NOQ3	Low
Kodiak Island	Alaska	2150	High	Low	High	Low	NOQ3	Low
Lake & Peninsula	Alaska	2164	High	Low	High	Low	NOQ3	Low
Matanuska-Susitna	Alaska	2170	Mod	Low	High	Low	NOQ3	Low
Nome	Alaska	2180	Low	Low	High	Low	NOQ3	Low
Northwest Arctic	Alaska	2188	Low	Low	High	Low	NOQ3	Low
Prince of Wales	Alaska	2201	Low	Low	High	Low	NOQ3	Low
SE Fairbanks	Alaska	2240	Mod	Low	Low	Low	NOQ3	Low
Sitka	Alaska	2220	Low	Low	High	Low	NOQ3	Low
Skagway-Yakutat-Ango	Alaska	2231	Low	Low	High	Low	NOQ3	Mod
Valdez-Cordova	Alaska	2261	High	Low	High	Low	NOQ3	Mod
Wade-Hampton	Alaska	2270	Low	Low	High	Low	NOQ3	Low
Wrangell-Petersburg	Alaska	2280	Low	Low	High	Low	NOQ3	Low
Yukon-koyukuk	Alaska	2290	Mod	Low	High	Low	NOQ3	Low
Apache	Arizona	4001	Mod	High	Low	Low	NOQ3	Low
Cochise	Arizona	4003	Mod	High	Low	Low	Q3	Low
Coconino	Arizona	4005	Mod	High	Low	Low	Q3	Low
Gila	Arizona	4007	Mod	Mod	Low	Low	Q3	Low
Graham	Arizona	4009	Mod	Low	Low	Low	NOQ3	Low
Greenlee	Arizona	4011	Mod	Low	Low	Low	Q3	Low
La Paz	Arizona	4012	Mod	Low	Low	Low	NOQ3	Low
Maricopa	Arizona	4013	Mod	Low	Low	Low	Q3	Low
Mohave	Arizona	4015	Mod	High	Low	Low	Q3	Low
Navajo	Arizona	4017	Mod	High	Low	Low	Q3	Low
Pima	Arizona	4019	Mod	Low	Low	Low	Q3	Low
Pinal	Arizona	4021	Mod	High	Low	Low	NOQ3	Low
Santa Cruz	Arizona	4023	Mod	Mod	Low	Low	Q3	Low
Yavapai	Arizona	4025	Mod	Mod	Low	Low	Q3	Low
Yuma	Arizona	4027	Mod	Low	Low	Low	NOQ3	Low
Arkansas	Arkansas	5001	Mod	Low	Mod	Mod	NOQ3	High
Ashley	Arkansas	5003	Mod	Low	Low	Low	NOQ3	Mod
Baxter	Arkansas	5005	Mod	Low	Low	Low	Q3	High
Benton	Arkansas	5007	Low	Low	Mod	Mod	Q3	High
Boone	Arkansas	5009	Mod	Mod	Low	Low	NOQ3	High
Bradley	Arkansas	5011	Mod	Low	Low	Low	Q3	Mod
Calhoun	Arkansas	5013	Mod	Low	Low	Low	NOQ3	High
Carroll	Arkansas	5015	Mod	Mod	Low	Low	NOQ3	High
Chicot	Arkansas	5017	Mod	High	Low	Low	NOQ3	Mod
Clark	Arkansas	5019	Mod	High	Mod	Mod	NOQ3	High
Clay	Arkansas	5021	High	Low	Low	Low	NOQ3	High
Cleburne	Arkansas	5023	Mod	Mod	Mod	Mod	Q3	High
Cleveland	Arkansas	5025	Mod	Low	Low	Low	Q3	High

County	State	FIPS	EQ	LS	Wind	Torn	Flood	Icing
Columbia	Arkansas	5027	Low	Low	Mod	Mod	Q3	Mod
Conway	Arkansas	5029	Mod	Mod	Mod	Mod	NOQ3	High
Craighead	Arkansas	5031	High	Low	Mod	Mod	Q3	High
Crawford	Arkansas	5033	Low	Mod	Low	Low	NOQ3	High
Crittenden	Arkansas	5035	High	High	Low	Low	Q3	High
Cross	Arkansas	5037	High	Low	Low	Low	Q3	High
Dallas	Arkansas	5039	Mod	Low	Low	Low	Q3	High
Desha	Arkansas	5041	Mod	High	Low	Low	Q3	Mod
Drew	Arkansas	5043	Mod	Low	Low	Low	Q3	Mod
Faulkner	Arkansas	5045	Mod	Mod	Mod	Mod	Q3	High
Franklin	Arkansas	5047	Low	Mod	Low	Low	NOQ3	High
Fulton	Arkansas	5049	Mod	Low	Low	Low	NOQ3	High
Garland	Arkansas	5051	Mod	Mod	Mod	Mod	NOQ3	High
Grant	Arkansas	5053	Mod	Low	Low	Low	Q3	High
Greene	Arkansas	5055	High	Low	Mod	Mod	Q3	High
Hempstead	Arkansas	5057	Mod	High	Low	Low	NOQ3	High
Hot Spring	Arkansas	5059	Mod	High	Mod	Mod	NOQ3	High
Howard	Arkansas	5061	Low	Mod	Mod	Mod	NOQ3	High
Independence	Arkansas	5063	Mod	High	Mod	Mod	NOQ3	High
Izard	Arkansas	5065	Mod	Low	Low	Low	Q3	High
Jackson	Arkansas	5067	High	High	Mod	Mod	Q3	High
Jefferson	Arkansas	5069	Mod	Low	Low	Low	Q3	High
Johnson	Arkansas	5071	Mod	High	Mod	Mod	NOQ3	High
Lafayette	Arkansas	5073	Low	Low	Low	Low	Q3	Mod
Lawrence	Arkansas	5075	High	Low	Low	Low	NOQ3	High
Lee	Arkansas	5077	Mod	High	Low	Low	NOQ3	High
Lincoln	Arkansas	5079	Mod	Low	Low	Low	Q3	High
Little River	Arkansas	5081	Low	Low	Low	Low	NOQ3	High
Logan	Arkansas	5083	Mod	High	Low	Low	NOQ3	High
Lonoke	Arkansas	5085	Mod	High	Mod	Mod	Q3	High
Madison	Arkansas	5087	Mod	Mod	Low	Low	NOQ3	High
Marion	Arkansas	5089	Mod	Low	Low	Low	NOQ3	High
Miller	Arkansas	5091	Low	Low	Low	Low	NOQ3	High
Mississippi	Arkansas	5093	High	High	Mod	Mod	Q3	High
Monroe	Arkansas	5095	Mod	Low	Low	Low	Q3	High
Montgomery	Arkansas	5097	Mod	Mod	Low	Low	Q3	High
Nevada	Arkansas	5099	Mod	High	Low	Low	NOQ3	High
Newton	Arkansas	5101	Mod	High	Low	Low	NOQ3	High
Ouachita	Arkansas	5103	Mod	Low	Low	Low	Q3	High
Perry	Arkansas	5105	Mod	Mod	Low	Low	NOQ3	High
Phillips	Arkansas	5107	Mod	High	Low	Low	Q3	High
Pike	Arkansas	5109	Mod	Mod	Low	Low	NOQ3	High
Poinsett	Arkansas	5111	High	Low	Mod	Mod	Q3	High
Polk	Arkansas	5113	Low	Mod	Low	Low	NOQ3	High
Pope	Arkansas	5115	Mod	High	Low	Low	NOQ3	High
Prairie	Arkansas	5117	Mod	Low	Mod	Mod	NOQ3	High
Pulaski	Arkansas	5119	Mod	High	Mod	Mod	Q3	High

County	State	FIPS	EQ	LS	Wind	Torn	Flood	Icing
Randolph	Arkansas	5121	Mod	Low	Low	Low	NOQ3	High
Saline	Arkansas	5125	Mod	High	Low	Low	NOQ3	High
Scott	Arkansas	5127	Low	High	Low	Low	NOQ3	High
Searcy	Arkansas	5129	Mod	High	Low	Low	NOQ3	High
Sebastian	Arkansas	5131	Low	High	Mod	Mod	Q3	High
Sevier	Arkansas	5133	Low	Low	Low	Low	NOQ3	High
Sharp	Arkansas	5135	Mod	Low	Low	Low	Q3	High
St Francis	Arkansas	5123	High	High	Low	Low	Q3	High
Stone	Arkansas	5137	Mod	High	Low	Low	Q3	High
Union	Arkansas	5139	Mod	Low	Low	Low	Q3	Mod
Van Buren	Arkansas	5141	Mod	Mod	Low	Low	Q3	High
Washington	Arkansas	5143	Low	Mod	Low	Low	NOQ3	High
White	Arkansas	5145	Mod	High	Mod	Mod	NOQ3	High
Woodruff	Arkansas	5147	High	Low	Mod	Mod	NOQ3	High
Yell	Arkansas	5149	Mod	High	Low	Low	NOQ3	High
Alameda	California	6001	High	High	Low	Low	Q3	Low
Alpine	California	6003	High	Mod	Low	Low	NOQ3	Low
Amador	California	6005	Mod	Mod	Low	Low	Q3	Low
Butte	California	6007	Mod	High	Low	Low	NOQ3	Low
Calaveras	California	6009	Mod	Mod	Low	Low	Q3	Low
Colusa	California	6011	High	High	Low	Low	Q3	Low
Contra Costa	California	6013	High	High	Low	Low	Q3	Low
Del Norte	California	6015	High	High	Low	Low	Q3	Low
El Dorado	California	6017	High	Mod	Low	Low	Q3	Low
Fresno	California	6019	High	High	Low	Low	Q3	Low
Glenn	California	6021	High	High	Low	Low	Q3	Low
Humboldt	California	6023	High	High	Low	Low	Q3	Low
Imperial	California	6025	High	Low	Low	Low	Q3	Low
Inyo	California	6027	High	High	Low	Low	Q3	Low
Kern	California	6029	High	High	Low	Low	Q3	Low
Kings	California	6031	High	High	Low	Low	Q3	Low
Lake	California	6033	High	High	Low	Low	Q3	Low
Lassen	California	6035	High	Low	Low	Low	Q3	Low
Los Angeles	California	6037	High	High	Low	Low	Q3	Low
Madera	California	6039	High	Low	Low	Low	Q3	Low
Marin	California	6041	High	High	Low	Low	Q3	Low
Mariposa	California	6043	Mod	Mod	Low	Low	Q3	Low
Mendocino	California	6045	High	High	Low	Low	Q3	Low
Merced	California	6047	High	High	Low	Low	Q3	Low
Modoc	California	6049	High	Mod	Low	Low	Q3	Low
Mono	California	6051	High	High	Low	Low	Q3	Low
Monterey	California	6053	High	High	Low	Low	Q3	Low
Napa	California	6055	High	High	Low	Low	Q3	Low
Nevada	California	6057	Mod	High	Low	Low	Q3	Low
Orange	California	6059	High	High	Mod	Mod	Q3	Low
Placer	California	6061	High	High	Low	Low	Q3	Low
Plumas	California	6063	High	Mod	Low	Low	Q3	Low

County	State	FIPS	EQ	LS	Wind	Torn	Flood	Icing
Riverside	California	6065	High	High	Low	Low	Q3	Low
Sacramento	California	6067	High	Mod	Low	Low	Q3	Low
San Benito	California	6069	High	High	Low	Low	Q3	Low
San Bernardino	California	6071	High	High	Low	Low	Q3	Low
San Diego	California	6073	High	High	Low	Low	NOQ3	Low
San Francisco	California	6075	High	Mod	Low	Low	NOQ3	Low
San Joaquin	California	6077	High	High	Low	Low	Q3	Low
San Mateo	California	6081	High	High	Low	Low	Q3	Low
Sanluis Obispo	California	6079	High	High	Low	Low	Q3	Low
Santa Barbara	California	6083	High	High	Low	Low	Q3	Low
Santa Clara	California	6085	High	High	Low	Low	Q3	Low
Santa Cruz	California	6087	High	High	Low	Low	Q3	Low
Shasta	California	6089	High	High	Low	Low	Q3	Low
Sierra	California	6091	High	Mod	Low	Low	Q3	Low
Siskiyou	California	6093	High	High	Low	Low	Q3	Low
Solano	California	6095	High	High	Low	Low	Q3	Low
Sonoma	California	6097	High	High	Low	Low	Q3	Low
Stanislaus	California	6099	High	High	Low	Low	Q3	Low
Sutter	California	6101	Mod	Low	Low	Low	Q3	Low
Tehama	California	6103	High	High	Low	Low	Q3	Low
Trinity	California	6105	High	High	Low	Low	Q3	Low
Tulare	California	6107	Mod	Mod	Low	Low	Q3	Low
Tuolumne	California	6109	High	Mod	Low	Low	Q3	Low
Ventura	California	6111	High	High	Low	Low	Q3	Low
Yolo	California	6113	High	Mod	Low	Low	Q3	Low
Yuba	California	6115	Mod	Mod	Low	Low	Q3	Low
Adams	Colorado	8001	Low	High	Mod	Mod	Q3	Low
Alamosa	Colorado	8003	Mod	Mod	Low	Low	NOQ3	Low
Arapahoe	Colorado	8005	Low	High	Mod	Mod	Q3	Low
Archuleta	Colorado	8007	Mod	High	Low	Low	NOQ3	Low
Baca	Colorado	8009	Low	High	Low	Low	NOQ3	Mod
Bent	Colorado	8011	Low	High	Low	Low	NOQ3	Low
Boulder	Colorado	8013	Mod	High	Low	Low	Q3	Low
Chaffee	Colorado	8015	Mod	High	Low	Low	NOQ3	Low
Cheyenne	Colorado	8017	Low	Mod	Low	Low	NOQ3	Mod
Clear Creek	Colorado	8019	Mod	Mod	Low	Low	NOQ3	Low
Conejos	Colorado	8021	Mod	High	Low	Low	NOQ3	Low
Costilla	Colorado	8023	Mod	High	Low	Low	NOQ3	Low
Crowley	Colorado	8025	Low	Mod	Low	Low	NOQ3	Low
Custer	Colorado	8027	Mod	High	Low	Low	NOQ3	Low
Delta	Colorado	8029	Mod	High	Low	Low	NOQ3	Low
Denver	Colorado	8031	Mod	Mod	Mod	Mod	Q3	Low
Dolores	Colorado	8033	Mod	High	Low	Low	NOQ3	Low
Douglas	Colorado	8035	Mod	Mod	Mod	Mod	NOQ3	Low
Eagle	Colorado	8037	Mod	High	Low	Low	NOQ3	Low
El Paso	Colorado	8041	Low	High	Mod	Mod	Q3	Low
Elbert	Colorado	8039	Low	High	Mod	Mod	NOQ3	Low

County	State	FIPS	EQ	LS	Wind	Torn	Flood	Icing
Fremont	Colorado	8043	Mod	High	Low	Low	NOQ3	Low
Garfield	Colorado	8045	Mod	High	Low	Low	NOQ3	Low
Gilpin	Colorado	8047	Mod	Mod	Low	Low	NOQ3	Low
Grand	Colorado	8049	Mod	High	Low	Low	NOQ3	Low
Gunnison	Colorado	8051	Mod	High	Low	Low	NOQ3	Low
Hinsdale	Colorado	8053	Mod	High	Low	Low	NOQ3	Low
Huerfano	Colorado	8055	Mod	High	Low	Low	NOQ3	Low
Jackson	Colorado	8057	Mod	High	Low	Low	NOQ3	Low
Jefferson	Colorado	8059	Mod	Mod	Low	Low	Q3	Low
Kiowa	Colorado	8061	Low	High	Low	Low	NOQ3	Mod
Kit Carson	Colorado	8063	Low	Mod	Mod	Mod	NOQ3	Mod
La Plata	Colorado	8067	Mod	High	Low	Low	NOQ3	Low
Lake	Colorado	8065	Mod	High	Low	Low	NOQ3	Low
Larimer	Colorado	8069	Mod	High	Low	Low	Q3	Low
Las Animas	Colorado	8071	Mod	High	Low	Low	NOQ3	Low
Lincoln	Colorado	8073	Low	High	Low	Low	NOQ3	Low
Logan	Colorado	8075	Low	Low	Low	Low	NOQ3	Low
Mesa	Colorado	8077	Mod	High	Low	Low	NOQ3	Low
Mineral	Colorado	8079	Mod	High	Low	Low	NOQ3	Low
Moffat	Colorado	8081	Mod	High	Low	Low	NOQ3	Low
Montezuma	Colorado	8083	Mod	High	Low	Low	NOQ3	Low
Montrose	Colorado	8085	Mod	High	Low	Low	NOQ3	Low
Morgan	Colorado	8087	Low	High	Mod	Mod	Q3	Low
Otero	Colorado	8089	Low	High	Low	Low	NOQ3	Low
Ouray	Colorado	8091	Mod	High	Low	Low	NOQ3	Low
Park	Colorado	8093	Mod	High	Low	Low	NOQ3	Low
Phillips	Colorado	8095	Low	Low	Mod	Mod	NOQ3	Mod
Pitkin	Colorado	8097	Mod	High	Low	Low	NOQ3	Low
Prowers	Colorado	8099	Low	High	Mod	Mod	NOQ3	Mod
Pueblo	Colorado	8101	Mod	High	Low	Low	Q3	Low
Rio Blanco	Colorado	8103	Mod	High	Low	Low	NOQ3	Low
Rio Grande	Colorado	8105	Mod	High	Low	Low	NOQ3	Low
Routt	Colorado	8107	Mod	High	Low	Low	NOQ3	Low
Saguache	Colorado	8109	Mod	High	Low	Low	NOQ3	Low
San Juan	Colorado	8111	Mod	High	Low	Low	NOQ3	Low
San Miguel	Colorado	8113	Mod	High	Low	Low	NOQ3	Low
Sedgwick	Colorado	8115	Low	Low	Mod	Mod	NOQ3	Mod
Summit	Colorado	8117	Mod	High	Low	Low	NOQ3	Low
Teller	Colorado	8119	Mod	Mod	Low	Low	NOQ3	Low
Washington	Colorado	8121	Low	High	Mod	Mod	NOQ3	Low
Weld	Colorado	8123	Mod	High	Mod	Mod	NOQ3	Low
Yuma	Colorado	8125	Low	Mod	Mod	Mod	NOQ3	Mod
Fairfield	Connecticut	9001	Mod	Mod	High	Low	Q3	Mod
Hartford	Connecticut	9003	Mod	High	Mod	Low	Q3	High
Litchfield	Connecticut	9005	Mod	Low	Mod	Low	Q3	High
Middlesex	Connecticut	9007	Mod	High	High	Low	Q3	High
New Haven	Connecticut	9009	Mod	Mod	High	Low	Q3	Mod

County	State	FIPS	EQ	LS	Wind	Torn	Flood	Icing
New London	Connecticut	9011	Mod	Low	High	Low	Q3	Mod
Tolland	Connecticut	9013	Mod	Low	Mod	Low	Q3	High
Windham	Connecticut	9015	Mod	Low	High	Low	NOQ3	High
Kent	Delaware	10001	Mod	Low	Mod	Mod	Q3	Mod
New Castle	Delaware	10003	Mod	Mod	Mod	Mod	Q3	Mod
Sussex	Delaware	10005	Low	Low	High	Low	Q3	Mod
Washington	District of C	olumbia1 1001	Low	High	Low	Low	Q3	Mod
Alachua	Florida	12001	Low	Low	Mod	Mod	Q3	Low
Baker	Florida	12003	Low	Low	Mod	Low	Q3	Low
Bay	Florida	12005	Low	Low	High	Mod	Q3	Low
Bradford	Florida	12007	Low	Low	Mod	Mod	NOQ3	Low
Brevard	Florida	12009	Low	Low	High	Mod	Q3	Low
Broward	Florida	12011	Low	Low	High	Mod	Q3	Low
Calhoun	Florida	12013	Low	Low	High	Low	Q3	Low
Charlotte	Florida	12015	Low	Low	High	Mod	Q3	Low
Citrus	Florida	12017	Low	Low	High	Mod	Q3	Low
Clay	Florida	12019	Low	Low	High	Mod	Q3	Low
Collier	Florida	12021	Low	Low	High	Low	Q3	Low
Columbia	Florida	12023	Low	Low	Mod	Low	NOQ3	Low
Dade	Florida	12025	Low	Low	High	Mod	Q3	Low
De Soto	Florida	12027	Low	Low	High	Mod	Q3	Low
Dixie	Florida	12029	Low	Low	High	Low	Q3	Low
Duval	Florida	12031	Low	Low	High	Mod	Q3	Low
Escambia	Florida	12033	Low	Low	High	Mod	Q3	Low
Flagler	Florida	12035	Low	Low	High	Mod	Q3	Low
Franklin	Florida	12037	Low	Low	High	Mod	Q3	Low
Gadsden	Florida	12039	Low	Mod	Mod	Mod	Q3	Low
Gilchrist	Florida	12041	Low	Low	Mod	Low	Q3	Low
Glades	Florida	12043	Low	Low	High	Low	Q3	Low
Gulf	Florida	12045	Low	Low	High	Mod	Q3	Low
Hamilton	Florida	12047	Low	Low	Mod	Low	NOQ3	Low
Hardee	Florida	12049	Low	Low	Mod	Low	Q3	Low
Hendry	Florida	12051	Low	Low	High	Low	Q3	Low
Hernando	Florida	12053	Low	Low	High	Mod	Q3	Low
Highlands	Florida	12055	Low	Low	High	Mod	Q3	Low
Hillsborough	Florida	12057	Low	Low	High	Mod	Q3	Low
Holmes	Florida	12059	Low	Low	High	Low	Q3	Low
Indian River	Florida	12061	Low	Low	High	Mod	Q3	Low
Jackson	Florida	12063	Low	Low	High	Mod	Q3	Low
Jefferson	Florida	12065	Low	Low	High	Low	NOQ3	Low
Lafayette	Florida	12067	Low	Low	High	Low	NOQ3	Low
Lake	Florida	12069	Low	Low	High	Mod	Q3	Low
Lee	Florida	12071	Low	Low	High	Mod	Q3	Low
Leon	Florida	12073	Low	Mod	High	Low	Q3	Low
Levy	Florida	12075	Low	Low	High	Low	Q3	Low
Liberty	Florida	12077	Low	Mod	High	Low	Q3	Low

County	State	FIPS	EQ	LS	Wind	Torn	Flood	Icing
Madison	Florida	12079	Low	Low	Mod	Low	NOQ3	Low
Manatee	Florida	12081	Low	Low	High	Mod	Q3	Low
Marion	Florida	12083	Low	Low	Mod	Mod	Q3	Low
Martin	Florida	12085	Low	Low	High	Mod	Q3	Low
Monroe	Florida	12087	Low	Low	High	Mod	Q3	Low
Nassau	Florida	12089	Low	Low	High	Mod	Q3	Low
Okaloosa	Florida	12091	Low	Low	High	Mod	Q3	Low
Okeechobee	Florida	12093	Low	Low	High	Low	NOQ3	Low
Orange	Florida	12095	Low	Low	High	Mod	Q3	Low
Osceola	Florida	12097	Low	Low	High	Low	Q3	Low
Palm Beach	Florida	12099	Low	Low	High	Mod	Q3	Low
Pasco	Florida	12101	Low	Low	High	Mod	Q3	Low
Pinellas	Florida	12103	Low	Low	High	High	h Q3	Low
Polk	Florida	12105	Low	Low	High	Mod	Q3	Low
Putnam	Florida	12107	Low	Low	High	Mod	Q3	Low
Santa Rosa	Florida	12113	Low	Low	High	Mod	Q3	Low
Sarasota	Florida	12115	Low	Low	High	Mod	Q3	Low
Seminole	Florida	12117	Low	Low	High	Mod	Q3	Low
St Johns	Florida	12109	Low	Low	High	Mod	Q3	Low
St Lucie	Florida	12111	Low	Low	High	Mod	Q3	Low
Sumter	Florida	12119	Low	Low	Mod	Low	Q3	Low
Suwannee	Florida	12121	Low	Low	Mod	Mod	Q3	Low
Taylor	Florida	12123	Low	Low	High	Low	NOQ3	Low
Union	Florida	12125	Low	Low	Mod	Low	NOQ3	Low
Volusia	Florida	12127	Low	Low	High	Mod	Q3	Low
Wakulla	Florida	12129	Low	Low	High	Low	Q3	Low
Walton	Florida	12131	Low	Low	High	Mod	Q3	Low
Washington	Florida	12133	Low	Low	High	Low	Q3	Low
Appling	Georgia	13001	Mod	Low	Mod	Low	NOQ3	Low
Atkinson	Georgia	13003	Low	Low	Mod	Low	NOQ3	Low
Bacon	Georgia	13005	Low	Low	Mod	Mod	NOQ3	Low
Baker	Georgia	13007	Low	Low	Mod	Low	Q3	Low
Baldwin	Georgia	13009	Mod	Low	Mod	Low	NOQ3	Mod
Banks	Georgia	13011	Mod	High	Low	Low	NOQ3	Mod
Barrow	Georgia	13013	Mod	High	Low	Low	NOQ3	Mod
Bartow	Georgia	13015	Mod	High	Mod	Mod	NOQ3	Mod
Ben Hill	Georgia	13017	Low	Low	Mod	Mod	NOQ3	Low
Berrien	Georgia	13019	Low	Low	Mod	Mod	NOQ3	Low
Bibb	Georgia	13021	Low	Low	Mod	Mod	Q3	Mod
Bleckley	Georgia	13023	Low	Low	Mod	Mod	NOQ3	Mod
Brantley	Georgia	13025	Low	Low	High	Low	NOQ3	Low
Brooks	Georgia	13027	Low	Low	Mod	Low	NOQ3	Low
Bryan	Georgia	13029	Mod	Low	High	Low	Q3	Low
Bulloch	Georgia	13031	Mod	Low	High	Low	NOQ3	Low
Burke	Georgia	13033	Mod	Low	Mod	Low	NOQ3	Mod
Butts	Georgia	13035	Mod	Low	Low	Low	Q3	Mod
Calhoun	Georgia	13037	Low	Low	Mod	Low	Q3	Low

County	State	FIPS	EQ	LS	Wind	Torn	Flood	Icing
Camden	Georgia	13039	Low	Low	High	Low	Q3	Low
Candler	Georgia	13043	Mod	Low	Mod	Low	NOQ3	Low
Carroll	Georgia	13045	Mod	High	Mod	Mod	Q3	Mod
Catoosa	Georgia	13047	Mod	Mod	Low	Low	NOQ3	Mod
Charlton	Georgia	13049	Low	Low	High	Low	NOQ3	Low
Chatham	Georgia	13051	Mod	Low	High	Mod	Q3	Low
Chattahoochee	Georgia	13053	Low	High	Mod	Low	NOQ3	Mod
Chattooga	Georgia	13055	Mod	Mod	Low	Low	NOQ3	Mod
Cherokee	Georgia	13057	Mod	High	Mod	Mod	Q3	Mod
Clarke	Georgia	13059	Mod	High	Mod	Mod	NOQ3	Mod
Clay	Georgia	13061	Low	Low	Mod	Low	NOQ3	Low
Clayton	Georgia	13063	Mod	Low	Mod	Mod	Q3	Mod
Clinch	Georgia	13065	Low	Low	Mod	Low	NOQ3	Low
Cobb	Georgia	13067	Mod	High	Mod	Mod	Q3	Mod
Coffee	Georgia	13069	Low	Low	Mod	Low	NOQ3	Low
Colquitt	Georgia	13071	Low	Low	Mod	Mod	NOQ3	Low
Columbia	Georgia	13073	Mod	Low	Mod	Low	NOQ3	Mod
Cook	Georgia	13075	Low	Low	Mod	Mod	NOQ3	Low
Coweta	Georgia	13077	Mod	Low	Mod	Mod	Q3	Mod
Crawford	Georgia	13079	Low	Low	Mod	Low	Q3	Mod
Crisp	Georgia	13081	Low	Low	Mod	Low	Q3	Low
Dade	Georgia	13083	Mod	High	Low	Low	NOQ3	Mod
Dawson	Georgia	13085	Mod	High	Mod	Mod	NOQ3	Mod
De Kalb	Georgia	13089	Mod	High	Mod	Mod	Q3	Mod
Decatur	Georgia	13087	Low	Mod	Mod	Mod	Q3	Low
Dodge	Georgia	13091	Low	Low	Mod	Low	Q3	Mod
Dooly	Georgia	13093	Low	Low	Mod	Mod	Q3	Mod
Dougherty	Georgia	13095	Low	Low	Mod	Mod	Q3	Low
Douglas	Georgia	13097	Mod	High	Mod	Mod	NOQ3	Mod
Early	Georgia	13099	Low	Low	Mod	Mod	Q3	Low
Echols	Georgia	13101	Low	Low	Mod	Low	NOQ3	Low
Effingham	Georgia	13103	Mod	Low	High	Low	NOQ3	Low
Elbert	Georgia	13105	Mod	High	Low	Low	NOQ3	Mod
Emanuel	Georgia	13107	Mod	Low	Mod	Low	NOQ3	Mod
Evans	Georgia	13109	Mod	Low	Mod	Low	NOQ3	Low
Fannin	Georgia	13111	Mod	High	Low	Low	NOQ3	Mod
Fayette	Georgia	13113	Mod	Low	Low	Low	Q3	Mod
Floyd	Georgia	13115	Mod	Mod	Mod	Mod	Q3	Mod
Forsyth	Georgia	13117	Mod	High	Low	Low	NOQ3	Mod
Franklin	Georgia	13119	Mod	High	Low	Low	NOQ3	Mod
Fulton	Georgia	13121	Mod	High	Mod	Mod	Q3	Mod
Gilmer	Georgia	13123	Mod	High	Low	Low	NOQ3	Mod
Glascock	Georgia	13125	Mod	Low	Mod	Low	NOQ3	Mod
Glynn	Georgia	13127	Low	Low	High	Mod	Q3	Low
Gordon	Georgia	13129	Mod	High	Low	Low	NOQ3	Mod
Grady	Georgia	13131	Low	Low	Mod	Mod	NOQ3	Low
Greene	Georgia	13133	Mod	Mod	Low	Low	NOQ3	Mod

County	State	FIPS	EQ	LS	Wind	Torn	Flood	Icing
Gwinnett	Georgia	13135	Mod	High	Low	Low	NOQ3	Mod
Habersham	Georgia	13137	Mod	High	Mod	Mod	NOQ3	Mod
Hall	Georgia	13139	Mod	High	Mod	Mod	NOQ3	Mod
Hancock	Georgia	13141	Mod	Low	Mod	Low	NOQ3	Mod
Haralson	Georgia	13143	Mod	High	Mod	Mod	Q3	Mod
Harris	Georgia	13145	Low	Low	Mod	Mod	NOQ3	Mod
Hart	Georgia	13147	Mod	High	Low	Low	NOQ3	Mod
Heard	Georgia	13149	Mod	Low	Mod	Low	NOQ3	Mod
Henry	Georgia	13151	Mod	Low	Low	Low	Q3	Mod
Houston	Georgia	13153	Low	Low	Mod	Mod	Q3	Mod
Irwin	Georgia	13155	Low	Low	Mod	Low	NOQ3	Low
Jackson	Georgia	13157	Mod	High	Low	Low	NOQ3	Mod
Jasper	Georgia	13159	Mod	Low	Mod	Low	NOQ3	Mod
Jeff Davis	Georgia	13161	Low	Low	Mod	Low	NOQ3	Low
Jefferson	Georgia	13163	Mod	Low	Mod	Low	NOQ3	Mod
Jenkins	Georgia	13165	Mod	Low	Mod	Low	NOQ3	Mod
Johnson	Georgia	13167	Mod	Low	Mod	Low	NOQ3	Mod
Jones	Georgia	13169	Mod	Low	Mod	Low	Q3	Mod
Lamar	Georgia	13171	Low	Low	Mod	Low	Q3	Mod
Lanier	Georgia	13173	Low	Low	Mod	Low	NOQ3	Low
Laurens	Georgia	13175	Mod	Low	Mod	Low	NOQ3	Mod
Lee	Georgia	13177	Low	Low	Mod	Mod	Q3	Low
Liberty	Georgia	13179	Mod	Low	High	Low	Q3	Low
Lincoln	Georgia	13181	Mod	Mod	Mod	Low	NOQ3	Mod
Long	Georgia	13183	Mod	Low	High	Low	NOQ3	Low
Lowndes	Georgia	13185	Low	Low	Mod	Mod	NOQ3	Low
Lumpkin	Georgia	13187	Mod	High	Low	Low	NOQ3	Mod
Macon	Georgia	13193	Low	Low	Mod	Low	Q3	Mod
Madison	Georgia	13195	Mod	High	Low	Low	NOQ3	Mod
Marion	Georgia	13197	Low	High	Mod	Low	NOQ3	Mod
Mcduffie	Georgia	13189	Mod	Low	Mod	Low	NOQ3	Mod
Mcintosh	Georgia	13191	Mod	Low	High	Low	Q3	Low
Meriwether	Georgia	13199	Low	Low	Mod	Mod	Q3	Mod
Miller	Georgia	13201	Low	Low	Mod	Low	Q3	Low
Mitchell	Georgia	13205	Low	Low	Mod	Mod	Q3	Low
Monroe	Georgia	13207	Mod	Low	Mod	Low	Q3	Mod
Montgomery	Georgia	13209	Mod	Low	Mod	Low	Q3	Low
Morgan	Georgia	13211	Mod	Low	Low	Low	NOQ3	Mod
Murray	Georgia	13213	Mod	High	Mod	Mod	NOQ3	Mod
Muscogee	Georgia	13215	Low	High	Mod	Mod	NOQ3	Mod
Newton	Georgia	13217	Mod	High	Low	Low	Q3	Mod
Oconee	Georgia	13219	Mod	High	Mod	Mod	NOQ3	Mod
Oglethorpe	Georgia	13221	Mod	High	Low	Low	NOQ3	Mod
Paulding	Georgia	13223	Mod	High	Low	Low	NOQ3	Mod
Peach	Georgia	13225	Low	Low	Mod	Mod	Q3	Mod
Pickens	Georgia	13227	Mod	High	Mod	Mod	NOQ3	Mod
Pierce	Georgia	13229	Low	Low	Mod	Low	NOQ3	Low

County	State	FIPS	EQ	LS	Wind	Torn	Flood	Icing
Pike	Georgia	13231	Low	Low	Mod	Low	Q3	Mod
Polk	Georgia	13233	Mod	High	Low	Low	Q3	Mod
Pulaski	Georgia	13235	Low	Low	Mod	Mod	Q3	Mod
Putnam	Georgia	13237	Mod	Low	Mod	Low	NOQ3	Mod
Quitman	Georgia	13239	Low	Low	Mod	Low	Q3	Low
Rabun	Georgia	13241	Mod	High	Low	Low	NOQ3	Mod
Randolph	Georgia	13243	Low	Low	Mod	Low	NOQ3	Low
Richmond	Georgia	13245	Mod	Low	Mod	Low	Q3	Mod
Rockdale	Georgia	13247	Mod	High	Mod	Mod	Q3	Mod
Schley	Georgia	13249	Low	Low	Mod	Mod	NOQ3	Mod
Screven	Georgia	13251	Mod	Low	Mod	Low	NOQ3	Mod
Seminole	Georgia	13253	Low	Low	Mod	Low	Q3	Low
Spalding	Georgia	13255	Low	Low	Mod	Mod	Q3	Mod
Stephens	Georgia	13257	Mod	High	Mod	Mod	NOQ3	Mod
Stewart	Georgia	13259	Low	Low	Mod	Low	Q3	Mod
Sumter	Georgia	13261	Low	Low	Mod	Mod	Q3	Mod
Talbot	Georgia	13263	Low	Low	Mod	Low	Q3	Mod
Taliaferro	Georgia	13265	Mod	Mod	Mod	Low	NOQ3	Mod
Tattnall	Georgia	13267	Mod	Low	Mod	Low	NOQ3	Low
Taylor	Georgia	13269	Low	Low	Mod	Low	NOQ3	Mod
Telfair	Georgia	13271	Low	Low	Mod	Low	Q3	Low
Terrell	Georgia	13273	Low	Low	Mod	Low	Q3	Low
Thomas	Georgia	13275	Low	Low	Mod	Low	NOQ3	Low
Tift	Georgia	13277	Low	Low	Mod	Mod	NOQ3	Low
Toombs	Georgia	13279	Mod	Low	Mod	Low	Q3	Low
Towns	Georgia	13281	Mod	High	Low	Low	NOQ3	Mod
Treutlen	Georgia	13283	Mod	Low	Mod	Low	NOQ3	Mod
Troup	Georgia	13285	Low	Low	Mod	Mod	Q3	Mod
Turner	Georgia	13287	Low	Low	Mod	Low	NOQ3	Low
Twiggs	Georgia	13289	Mod	Low	Mod	Mod	NOQ3	Mod
Union	Georgia	13291	Mod	High	Low	Low	NOQ3	Mod
Upson	Georgia	13293	Low	Low	Mod	Low	Q3	Mod
Walker	Georgia	13295	Mod	Mod	Low	Low	NOQ3	Mod
Walton	Georgia	13297	Mod	High	Mod	Mod	NOQ3	Mod
Ware	Georgia	13299	Low	Low	Mod	Low	NOQ3	Low
Warren	Georgia	13301	Mod	Low	Mod	Low	NOQ3	Mod
Washington	Georgia	13303	Mod	Low	Mod	Low	NOQ3	Mod
Wayne	Georgia	13305	Mod	Low	High	Low	NOQ3	Low
Webster	Georgia	13307	Low	Low	Mod	Low	NOQ3	Mod
Wheeler	Georgia	13309	Low	Low	Mod	Low	Q3	Low
White	Georgia	13311	Mod	High	Low	Low	NOQ3	Mod
Whitfield	Georgia	13313	Mod	Mod	Low	Low	NOQ3	Mod
Wilcox	Georgia	13315	Low	Low	Mod	Low	Q3	Low
Wilkes	Georgia	13317	Mod	Mod	Mod	Low	NOQ3	Mod
Wilkinson	Georgia	13319	Mod	Low	Mod	Low	NOQ3	Mod
Worth	Georgia	13321	Low	Low	Mod	Mod	Q3	Low
Hawaii	Hawaii	15001	High	Low	High	Low	Q3	Low

County	State	FIPS	EQ	LS	Wind	Torn	Flood	Icing
Honolulu	Hawaii	15003	Mod	Low	High	Low	Q3	Low
Kauai	Hawaii	15007	Low	Low	High	Low	Q3	Low
Maui	Hawaii	15009	Mod	Low	High	Low	Q3	Low
Ada	Idaho	16001	Mod	High	Low	Low	Q3	Low
Adams	Idaho	16003	Mod	Mod	Low	Low	NOQ3	Low
Bannock	Idaho	16005	Mod	Low	Low	Low	NOQ3	Low
Bear Lake	Idaho	16007	High	Mod	Low	Low	NOQ3	Low
Benewah	Idaho	16009	Mod	Mod	Low	Low	Q3	Low
Bingham	Idaho	16011	Mod	Mod	Low	Low	Q3	Low
Blaine	Idaho	16013	Mod	High	Low	Low	Q3	Low
Boise	Idaho	16015	Mod	High	Low	Low	NOQ3	Low
Bonner	Idaho	16017	Mod	Low	Low	Low	Q3	Low
Bonneville	Idaho	16019	High	High	Low	Low	Q3	Low
Boundary	Idaho	16021	Mod	Mod	Low	Low	Q3	Low
Butte	Idaho	16023	Mod	High	Low	Low	NOQ3	Low
Camas	Idaho	16025	Mod	Mod	Low	Low	NOQ3	Low
Canyon	Idaho	16027	Mod	Mod	Low	Low	NOQ3	Low
Caribou	Idaho	16029	High	High	Low	Low	NOQ3	Low
Cassia	Idaho	16031	Mod	Mod	Low	Low	NOQ3	Low
Clark	Idaho	16033	High	High	Low	Low	NOQ3	Low
Clearwater	Idaho	16035	Mod	Mod	Low	Low	NOQ3	Low
Custer	Idaho	16037	Mod	High	Low	Low	Q3	Low
Elmore	Idaho	16039	Mod	High	Low	Low	NOQ3	Low
Franklin	Idaho	16041	Mod	High	Low	Low	NOQ3	Low
Fremont	Idaho	16043	High	High	Low	Low	Q3	Low
Gem	Idaho	16045	Mod	Mod	Low	Low	Q3	Low
Gooding	Idaho	16047	Mod	Low	Low	Low	NOQ3	Low
Idaho	Idaho	16049	Mod	High	Low	Low	NOQ3	Low
Jefferson	Idaho	16051	Mod	Mod	Low	Low	Q3	Low
Jerome	Idaho	16053	Mod	Low	Low	Low	NOQ3	Low
Kootenai	Idaho	16055	Mod	Mod	Low	Low	Q3	Low
Latah	Idaho	16057	Mod	Low	Low	Low	NOQ3	Low
Lemhi	Idaho	16059	Mod	High	Low	Low	NOQ3	Low
Lewis	Idaho	16061	Mod	Low	Low	Low	NOQ3	Low
Lincoln	Idaho	16063	Mod	Low	Low	Low	NOQ3	Low
Madison	Idaho	16065	Mod	Mod	Low	Low	Q3	Low
Minidoka	Idaho	16067	Mod	Low	Low	Low	NOQ3	Low
Nez Perce	Idaho	16069	Mod	Low	Low	Low	NOQ3	Low
Oneida	Idaho	16071	Mod	High	Low	Low	NOQ3	Low
Owyhee	Idaho	16073	Mod	High	Low	Low	NOQ3	Low
Payette	Idaho	16075	Mod	Low	Low	Low	Q3	Low
Power	Idaho	16077	Mod	Mod	Low	Low	NOQ3	Low
Shoshone	Idaho	16079	Mod	Mod	Low	Low	Q3	Low
Teton	Idaho	16081	Mod	High	Low	Low	NOQ3	Low
Twin Falls	Idaho	16083	Mod	High	Low	Low	NOQ3	Low
Valley	Idaho	16085	Mod	High	Low	Low	NOQ3	Low
Washington	Idaho	16087	Mod	Mod	Low	Low	Q3	Low

County	State	FIPS	EQ	LS	Wind	Torn	Flood	Icing
Adams	Illinois	17001	Low	Mod	Low	Low	Q3	High
Alexander	Illinois	17003	High	High	Mod	Mod	Q3	High
Bond	Illinois	17005	Mod	Low	Low	Low	NOQ3	High
Boone	Illinois	17007	Low	Low	Low	Low	NOQ3	Mod
Brown	Illinois	17009	Low	Low	Low	Low	NOQ3	High
Bureau	Illinois	17011	Low	High	Low	Low	NOQ3	Mod
Calhoun	Illinois	17013	Mod	High	Low	Low	Q3	High
Carroll	Illinois	17015	Low	High	Low	Low	NOQ3	Mod
Cass	Illinois	17017	Low	Low	Low	Low	NOQ3	High
Champaign	Illinois	17019	Mod	Low	Mod	Mod	NOQ3	High
Christian	Illinois	17021	Mod	Low	Low	Low	NOQ3	High
Clark	Illinois	17023	Mod	Low	Low	Low	NOQ3	High
Clay	Illinois	17025	Mod	Mod	Low	Low	NOQ3	High
Clinton	Illinois	17027	Mod	Low	Low	Low	Q3	High
Coles	Illinois	17029	Mod	Mod	Mod	Mod	NOQ3	High
Cook	Illinois	17031	Mod	High	Mod	Mod	Q3	Mod
Crawford	Illinois	17033	Mod	Low	Mod	Mod	NOQ3	High
Cumberland	Illinois	17035	Mod	Low	Low	Low	NOQ3	High
De Kalb	Illinois	17037	Mod	Low	Low	Low	Q3	Mod
De Witt	Illinois	17039	Low	Low	Mod	Mod	NOQ3	High
Douglas	Illinois	17041	Mod	Low	Mod	Mod	NOQ3	High
Du Page	Illinois	17043	Mod	Mod	Mod	Mod	Q3	Mod
Edgar	Illinois	17045	Mod	Mod	Low	Low	NOQ3	High
Edwards	Illinois	17047	Mod	Mod	Mod	Mod	NOQ3	High
Effingham	Illinois	17049	Mod	Low	Mod	Mod	NOQ3	High
Fayette	Illinois	17051	Mod	Low	Low	Low	NOQ3	High
Ford	Illinois	17053	Low	Mod	Mod	Mod	NOQ3	High
Franklin	Illinois	17055	Mod	Mod	Low	Low	NOQ3	High
Fulton	Illinois	17057	Low	High	Mod	Mod	NOQ3	High
Gallatin	Illinois	17059	Mod	Mod	Low	Low	Q3	High
Greene	Illinois	17061	Mod	High	Low	Low	NOQ3	High
Grundy	Illinois	17063	Mod	Mod	Mod	Mod	Q3	High
Hamilton	Illinois	17065	Mod	Mod	Low	Low	NOQ3	High
Hancock	Illinois	17067	Low	Low	Low	Low	NOQ3	High
Hardin	Illinois	17069	Mod	Low	Low	Low	Q3	High
Henderson	Illinois	17071	Low	High	Low	Low	NOQ3	Mod
Henry	Illinois	17073	Low	High	Mod	Mod	Q3	Mod
Iroquois	Illinois	17075	Low	Mod	Mod	Mod	NOQ3	High
Jackson	Illinois	17077	High	High	Mod	Mod	NOQ3	High
Jasper	Illinois	17079	Mod	Low	Low	Low	NOQ3	High
Jefferson	Illinois	17081	Mod	Mod	Low	Low	NOQ3	High
Jersey	Illinois	17083	Mod	High	Low	Low	Q3	High
Jo Daviess	Illinois	17085	Low	High	Low	Low	NOQ3	Mod
Johnson	Illinois	17087	High	Low	Low	Low	NOQ3	High
Kane	Illinois	17089	Mod	Low	Mod	Mod	Q3	Mod
Kankakee	Illinois	17091	Low	Mod	Mod	Mod	Q3	High
Kendall	Illinois	17093	Mod	Mod	Mod	Mod	Q3	Mod

County	State	FIPS	EQ	LS	Wind	Torn	Flood	Icing
Knox	Illinois	17095	Low	High	Mod	Mod	NOQ3	High
La Salle	Illinois	17099	Mod	High	Mod	Mod	Q3	High
Lake	Illinois	17097	Low	High	Mod	Mod	Q3	Mod
Lawrence	Illinois	17101	Mod	Mod	Low	Low	NOQ3	High
Lee	Illinois	17103	Mod	Low	Mod	Mod	NOQ3	Mod
Livingston	Illinois	17105	Low	High	Low	Low	Q3	High
Logan	Illinois	17107	Mod	Low	Mod	Mod	NOQ3	High
Macon	Illinois	17115	Mod	Low	Mod	Mod	NOQ3	High
Macoupin	Illinois	17117	Mod	High	Low	Low	NOQ3	High
Madison	Illinois	17119	Mod	High	Mod	Mod	Q3	High
Marion	Illinois	17121	Mod	Low	Low	Low	NOQ3	High
Marshall	Illinois	17123	Low	High	Low	Low	NOQ3	High
Mason	Illinois	17125	Low	High	Mod	Mod	NOQ3	High
Massac	Illinois	17127	High	Low	Low	Low	Q3	High
Mcdonough	Illinois	17109	Low	Low	Mod	Mod	NOQ3	High
Mchenry	Illinois	17111	Low	Low	Low	Low	Q3	Mod
Mclean	Illinois	17113	Low	Low	Mod	Mod	NOQ3	High
Menard	Illinois	17129	Low	Low	Low	Low	NOQ3	High
Mercer	Illinois	17131	Low	High	Low	Low	NOQ3	Mod
Monroe	Illinois	17133	Mod	High	Mod	Mod	NOQ3	High
Montgomery	Illinois	17135	Mod	Low	Mod	Mod	NOQ3	High
Morgan	Illinois	17137	Mod	Low	Mod	Mod	NOQ3	High
Moultrie	Illinois	17139	Mod	Low	Low	Low	NOQ3	High
Ogle	Illinois	17141	Low	Low	Low	Low	Q3	Mod
Peoria	Illinois	17143	Low	High	Mod	Mod	Q3	High
Perry	Illinois	17145	Mod	Mod	Mod	Mod	NOQ3	High
Piatt	Illinois	17147	Mod	Low	Mod	Mod	NOQ3	High
Pike	Illinois	17149	Mod	High	Low	Low	Q3	High
Pope	Illinois	17151	High	Low	Low	Low	Q3	High
Pulaski	Illinois	17153	High	High	Low	Low	NOQ3	High
Putnam	Illinois	17155	Low	High	Mod	Mod	NOQ3	Mod
Randolph	Illinois	17157	Mod	High	Mod	Mod	NOQ3	High
Richland	Illinois	17159	Mod	Mod	Low	Low	NOQ3	High
Rock Island	Illinois	17161	Low	High	Mod	Mod	Q3	Mod
Saline	Illinois	17165	High	Mod	Low	Low	NOQ3	High
Sangamon	Illinois	17167	Mod	Low	Mod	Mod	NOQ3	High
Schuyler	Illinois	17169	Low	High	Mod	Mod	NOQ3	High
Scott	Illinois	17171	Mod	Low	Low	Low	NOQ3	High
Shelby	Illinois	17173	Mod	Low	Low	Low	NOQ3	High
St Clair	Illinois	17163	Mod	High	Mod	Mod	Q3	High
Stark	Illinois	17175	Low	High	Mod	Mod	NOQ3	Mod
Stephenson	Illinois	17177	Low	Mod	Low	Low	NOQ3	Mod
Tazewell	Illinois	17179	Low	High	Mod	Mod	Q3	High
Union	Illinois	17181	High	High	Low	Low	NOQ3	High
Vermilion	Illinois	17183	Mod	Mod	Mod	Mod	NOQ3	High
Wabash	Illinois	17185	Mod	Mod	Mod	Mod	NOQ3	High
Warren	Illinois	17187	Low	Low	Low	Low	NOQ3	High

County	State	FIPS	EQ	LS	Wind	Torn	Flood	Icing
Washington	Illinois	17189	Mod	Low	Mod	Mod	NOQ3	High
Wayne	Illinois	17191	Mod	Mod	Low	Low	NOQ3	High
White	Illinois	17193	Mod	Mod	Low	Low	NOQ3	High
Whiteside	Illinois	17195	Low	High	Low	Low	NOQ3	Mod
Will	Illinois	17197	Mod	Mod	Mod	Mod	Q3	High
Williamson	Illinois	17199	High	Mod	Low	Low	NOQ3	High
Winnebago	Illinois	17201	Low	Low	Low	Low	Q3	Mod
Woodford	Illinois	17203	Low	High	Mod	Mod	NOQ3	High
Adams	Indiana	18001	Mod	Low	Mod	Mod	NOQ3	High
Allen	Indiana	18003	Low	Low	Mod	Mod	Q3	High
Bartholomew	Indiana	18005	Low	Mod	Mod	Mod	Q3	Mod
Benton	Indiana	18007	Low	Low	Mod	Mod	NOQ3	High
Blackford	Indiana	18009	Low	Low	Low	Low	NOQ3	High
Boone	Indiana	18011	Low	Low	Mod	Mod	Q3	High
Brown	Indiana	18013	Mod	Mod	Low	Low	NOQ3	Mod
Carroll	Indiana	18015	Low	Low	Mod	Mod	NOQ3	High
Cass	Indiana	18017	Low	Low	Mod	Mod	NOQ3	High
Clark	Indiana	18019	Mod	Mod	Mod	Mod	Q3	Mod
Clay	Indiana	18021	Mod	Mod	Low	Low	NOQ3	High
Clinton	Indiana	18023	Low	Low	Mod	Mod	NOQ3	High
Crawford	Indiana	18025	Mod	Mod	Low	Low	Q3	Mod
Daviess	Indiana	18027	Mod	Mod	Mod	Mod	NOQ3	Mod
De Kalb	Indiana	18033	Low	Low	Low	Low	NOQ3	High
Dearborn	Indiana	18029	Low	High	Mod	Mod	Q3	Mod
Decatur	Indiana	18031	Low	Low	Mod	Mod	NOQ3	Mod
Delaware	Indiana	18035	Low	Low	Mod	Mod	Q3	High
Dubois	Indiana	18037	Mod	Mod	Low	Low	NOQ3	Mod
Elkhart	Indiana	18039	Low	Low	Mod	Mod	Q3	High
Fayette	Indiana	18041	Low	Low	Mod	Mod	NOQ3	Mod
Floyd	Indiana	18043	Mod	Mod	Low	Low	Q3	Mod
Fountain	Indiana	18045	Mod	Low	Low	Low	NOQ3	High
Franklin	Indiana	18047	Low	High	Low	Low	Q3	Mod
Fulton	Indiana	18049	Low	Low	Mod	Mod	NOQ3	High
Gibson	Indiana	18051	Mod	Mod	Low	Low	NOQ3	High
Grant	Indiana	18053	Low	Low	Mod	Mod	NOQ3	High
Greene	Indiana	18055	Mod	Mod	Low	Low	NOQ3	High
Hamilton	Indiana	18057	Low	Low	Mod	Mod	Q3	High
Hancock	Indiana	18059	Low	Low	Mod	Mod	NOQ3	Mod
Harrison	Indiana	18061	Mod	Mod	Low	Low	Q3	Mod
Hendricks	Indiana	18063	Mod	Mod	Mod	Mod	NOQ3	High
Henry	Indiana	18065	Low	Low	Mod	Mod	NOQ3	Mod
Howard	Indiana	18067	Low	Low	Mod	Mod	NOQ3	High
Huntington	Indiana	18069	Low	Low	Mod	Mod	NOQ3	High
Jackson	Indiana	18071	Mod	Mod	Mod	Mod	Q3	Mod
Jasper	Indiana	18073	Low	Mod	Mod	Mod	NOQ3	High
Jay	Indiana	18075	Mod	Low	Low	Low	NOQ3	High
Jefferson	Indiana	18077	Low	High	Mod	Mod	Q3	Mod

County	State	FIPS	EQ	LS	Wind	Torn	Flood	Icing
Jennings	Indiana	18079	Low	Mod	Mod	Mod	NOQ3	Mod
Johnson	Indiana	18081	Low	Mod	Mod	Mod	Q3	Mod
Knox	Indiana	18083	Mod	Mod	Mod	Mod	NOQ3	High
Kosciusko	Indiana	18085	Low	Low	Mod	Mod	Q3	High
La Porte	Indiana	18091	Low	Mod	Mod	Mod	Q3	High
Lagrange	Indiana	18087	Low	Low	Mod	Mod	NOQ3	High
Lake	Indiana	18089	Low	Mod	Mod	Mod	Q3	High
Lawrence	Indiana	18093	Mod	Mod	Mod	Mod	NOQ3	Mod
Madison	Indiana	18095	Low	Low	Mod	Mod	NOQ3	High
Marion	Indiana	18097	Low	Low	Mod	Mod	Q3	High
Marshall	Indiana	18099	Low	Low	Mod	Mod	NOQ3	High
Martin	Indiana	18101	Mod	Mod	Low	Low	NOQ3	Mod
Miami	Indiana	18103	Low	Low	Mod	Mod	NOQ3	High
Monroe	Indiana	18105	Mod	Mod	Mod	Mod	NOQ3	Mod
Montgomery	Indiana	18107	Mod	Low	Mod	Mod	NOQ3	High
Morgan	Indiana	18109	Mod	Mod	Mod	Mod	NOQ3	Mod
Newton	Indiana	18111	Low	Mod	Mod	Mod	NOQ3	High
Noble	Indiana	18113	Low	Low	Mod	Mod	NOQ3	High
Ohio	Indiana	18115	Low	High	Low	Low	Q3	Mod
Orange	Indiana	18117	Mod	Mod	Low	Low	NOQ3	Mod
Owen	Indiana	18119	Mod	Mod	Mod	Mod	NOQ3	High
Parke	Indiana	18121	Mod	Mod	Low	Low	NOQ3	High
Perry	Indiana	18123	Mod	Mod	Low	Low	Q3	Mod
Pike	Indiana	18125	Mod	Mod	Mod	Mod	NOQ3	High
Porter	Indiana	18127	Low	Mod	Mod	Mod	NOQ3	High
Posey	Indiana	18129	Mod	Mod	Low	Low	Q3	High
Pulaski	Indiana	18131	Low	Mod	Mod	Mod	NOQ3	High
Putnam	Indiana	18133	Mod	Mod	Mod	Mod	NOQ3	High
Randolph	Indiana	18135	Mod	Low	Mod	Mod	NOQ3	Mod
Ripley	Indiana	18137	Low	High	Mod	Mod	NOQ3	Mod
Rush	Indiana	18139	Low	Low	Mod	Mod	NOQ3	Mod
Scott	Indiana	18143	Mod	Mod	Mod	Mod	NOQ3	Mod
Shelby	Indiana	18145	Low	Mod	Mod	Mod	Q3	Mod
Spencer	Indiana	18147	Mod	Mod	Low	Low	Q3	Mod
St Joseph	Indiana	18141	Low	Low	Mod	Mod	NOQ3	High
Starke	Indiana	18149	Low	Low	Mod	Mod	NOQ3	High
Steuben	Indiana	18151	Low	Low	Mod	Mod	NOQ3	High
Sullivan	Indiana	18153	Mod	Mod	Low	Low	NOQ3	High
Switzerland	Indiana	18155	Low	High	Mod	Mod	Q3	Mod
Tippecanoe	Indiana	18157	Low	Low	Mod	Mod	NOQ3	High
Tipton	Indiana	18159	Low	Low	Mod	Mod	NOQ3	High
Union	Indiana	18161	Low	Low	Low	Low	NOQ3	Mod
Vanderburgh	Indiana	18163	Mod	Mod	Mod	Mod	Q3	Mod
Vermillion	Indiana	18165	Mod	Low	Mod	Mod	NOQ3	High
Vigo	Indiana	18167	Mod	Low	Mod	Mod	Q3	High
Wabash	Indiana	18169	Low	Low	Low	Low	NOQ3	High
Warren	Indiana	18171	Low	Low	Low	Low	NOQ3	High

County	State	FIPS	EQ	LS	Wind	Torn	Flood	Icing
Warrick	Indiana	18173	Mod	Mod	Low	Low	Q3	Mod
Washington	Indiana	18175	Mod	Mod	Mod	Mod	NOQ3	Mod
Wayne	Indiana	18177	Mod	Low	Mod	Mod	NOQ3	Mod
Wells	Indiana	18179	Mod	Low	Mod	Mod	NOQ3	High
White	Indiana	18181	Low	Low	Low	Low	NOQ3	High
Whitley	Indiana	18183	Low	Low	Mod	Mod	NOQ3	High
Adair	Iowa	19001	Low	Mod	Mod	Mod	NOQ3	Mod
Adams	Iowa	19003	Low	Low	Low	Low	NOQ3	Mod
Allamakee	Iowa	19005	Low	Mod	Low	Low	NOQ3	Mod
Appanoose	Iowa	19007	Low	Mod	Mod	Mod	NOQ3	Mod
Audubon	Iowa	19009	Low	Mod	Low	Low	NOQ3	Mod
Benton	Iowa	19011	Low	Low	Low	Low	NOQ3	Mod
Black Hawk	Iowa	19013	Low	Low	Mod	Mod	Q3	Mod
Boone	Iowa	19015	Low	Mod	Mod	Mod	NOQ3	Mod
Bremer	Iowa	19017	Low	Low	Mod	Mod	NOQ3	Mod
Buchanan	Iowa	19019	Low	Low	Mod	Mod	NOQ3	Mod
Buena Vista	Iowa	19021	Low	Mod	Low	Low	NOQ3	High
Butler	Iowa	19023	Low	Low	Low	Low	NOQ3	High
Calhoun	Iowa	19025	Low	Mod	Mod	Mod	NOQ3	Mod
Carroll	Iowa	19027	Low	Mod	Mod	Mod	NOQ3	Mod
Cass	Iowa	19029	Low	Mod	Mod	Mod	NOQ3	Mod
Cedar	Iowa	19031	Low	Low	Mod	Mod	NOQ3	Mod
Cerro Gordo	Iowa	19033	Low	Low	Mod	Mod	NOQ3	High
Cherokee	Iowa	19035	Low	Mod	Mod	Mod	NOQ3	High
Chickasaw	Iowa	19037	Low	Low	Mod	Mod	NOQ3	High
Clarke	Iowa	19039	Low	Mod	Mod	Mod	NOQ3	Mod
Clay	Iowa	19041	Low	Low	Mod	Mod	NOQ3	High
Clayton	Iowa	19043	Low	Mod	Low	Low	NOQ3	Mod
Clinton	Iowa	19045	Low	Mod	Mod	Mod	NOQ3	Mod
Crawford	Iowa	19047	Low	Mod	Mod	Mod	NOQ3	Mod
Dallas	Iowa	19049	Low	Mod	Mod	Mod	NOQ3	Mod
Davis	Iowa	19051	Low	Mod	Mod	Mod	NOQ3	Mod
Decatur	Iowa	19053	Low	Mod	Mod	Mod	NOQ3	Mod
Delaware	Iowa	19055	Low	Mod	Mod	Mod	NOQ3	Mod
Des Moines	Iowa	19057	Low	Low	Mod	Mod	NOQ3	Mod
Dickinson	Iowa	19059	Low	Low	Mod	Mod	NOQ3	High
Dubuque	Iowa	19061	Low	Mod	Mod	Mod	NOQ3	Mod
Emmet	Iowa	19063	Low	Low	Mod	Mod	NOQ3	High
Fayette	Iowa	19065	Low	Mod	Mod	Mod	NOQ3	Mod
Floyd	Iowa	19067	Low	Low	Mod	Mod	NOQ3	High
Franklin	Iowa	19069	Low	Low	Low	Low	NOQ3	High
Fremont	Iowa	19071	Low	Mod	Mod	Mod	NOQ3	Mod
Greene	Iowa	19073	Low	Mod	Low	Low	NOQ3	Mod
Grundy	Iowa	19075	Low	Mod	Mod	Mod	NOQ3	Mod
Guthrie	Iowa	19077	Low	Mod	Low	Low	NOQ3	Mod
Hamilton	Iowa	19079	Low	Mod	Mod	Mod	NOQ3	Mod
Hancock	Iowa	19081	Low	Low	Mod	Mod	NOQ3	High

County	State	FIPS	EQ	LS	Wind	Torn	Flood	Icing
Hardin	Iowa	19083	Low	Mod	Mod	Mod	NOQ3	Mod
Harrison	Iowa	19085	Low	Mod	Low	Low	NOQ3	Mod
Henry	Iowa	19087	Low	Mod	Low	Low	NOQ3	Mod
Howard	Iowa	19089	Low	Mod	Mod	Mod	NOQ3	High
Humboldt	Iowa	19091	Low	Low	Mod	Mod	NOQ3	High
Ida	Iowa	19093	Low	Mod	Low	Low	NOQ3	Mod
Iowa	Iowa	19095	Low	Low	Mod	Mod	NOQ3	Mod
Jackson	Iowa	19097	Low	Mod	Low	Low	NOQ3	Mod
Jasper	Iowa	19099	Low	Mod	Low	Low	NOQ3	Mod
Jefferson	Iowa	19101	Low	Mod	Low	Low	NOQ3	Mod
Johnson	Iowa	19103	Low	Low	Mod	Mod	Q3	Mod
Jones	Iowa	19105	Low	Low	Mod	Mod	NOQ3	Mod
Keokuk	Iowa	19107	Low	Mod	Mod	Mod	NOQ3	Mod
Kossuth	Iowa	19109	Low	Low	Mod	Mod	NOQ3	High
Lee	Iowa	19111	Low	Mod	Mod	Mod	NOQ3	Mod
Linn	Iowa	19113	Low	Low	Mod	Mod	Q3	Mod
Louisa	Iowa	19115	Low	Mod	Mod	Mod	NOQ3	Mod
Lucas	Iowa	19117	Low	Mod	Low	Low	NOQ3	Mod
Lyon	Iowa	19119	Low	Low	Mod	Mod	NOQ3	High
Madison	Iowa	19121	Low	Mod	Low	Low	NOQ3	Mod
Mahaska	Iowa	19123	Low	Mod	Low	Low	NOQ3	Mod
Marion	Iowa	19125	Low	Mod	Mod	Mod	NOQ3	Mod
Marshall	Iowa	19127	Low	Mod	Mod	Mod	NOQ3	Mod
Mills	Iowa	19129	Low	Mod	Low	Low	NOQ3	Mod
Mitchell	Iowa	19131	Low	Low	Low	Low	NOQ3	High
Monona	Iowa	19133	Low	Mod	Low	Low	NOQ3	Mod
Monroe	Iowa	19135	Low	Mod	Low	Low	NOQ3	Mod
Montgomery	Iowa	19137	Low	Mod	Mod	Mod	NOQ3	Mod
Muscatine	Iowa	19139	Low	High	Mod	Mod	NOQ3	Mod
Obrien	Iowa	19141	Low	Low	Mod	Mod	NOQ3	High
Osceola	Iowa	19143	Low	Low	Mod	Mod	NOQ3	High
Page	Iowa	19145	Low	Mod	Mod	Mod	NOQ3	Mod
Palo Alto	Iowa	19147	Low	Low	Mod	Mod	NOQ3	High
Plymouth	Iowa	19149	Low	Mod	Mod	Mod	NOQ3	Mod
Pocahontas	Iowa	19151	Low	Mod	Mod	Mod	NOQ3	High
Polk	Iowa	19153	Low	Mod	Mod	Mod	Q3	Mod
Pottawattamie	Iowa	19155	Low	Mod	Low	Low	Q3	Mod
Poweshiek	Iowa	19157	Low	Mod	Mod	Mod	NOQ3	Mod
Ringgold	Iowa	19159	Low	Low	Mod	Mod	NOQ3	Mod
Sac	Iowa	19161	Low	Mod	Low	Low	NOQ3	Mod
Scott	Iowa	19163	Low	High	Mod	Mod	Q3	Mod
Shelby	Iowa	19165	Low	Mod	Mod	Mod	NOQ3	Mod
Sioux	Iowa	19167	Low	Low	Low	Low	NOQ3	High
Story	Iowa	19169	Low	Mod	Mod	Mod	Q3	Mod
Tama	Iowa	19171	Low	Low	Mod	Mod	NOQ3	Mod
Taylor	Iowa	19173	Low	Low	Mod	Mod	NOQ3	Mod
Union	Iowa	19175	Low	Low	Mod	Mod	NOQ3	Mod

County	State	FIPS	EQ	LS	Wind	Torn	Flood	Icing
Van Buren	Iowa	19177	Low	Mod	Mod	Mod	NOQ3	Mod
Wapello	Iowa	19179	Low	Mod	Mod	Mod	NOQ3	Mod
Warren	Iowa	19181	Low	Mod	Mod	Mod	NOQ3	Mod
Washington	Iowa	19183	Low	Mod	Low	Low	NOQ3	Mod
Wayne	Iowa	19185	Low	Mod	Mod	Mod	NOQ3	Mod
Webster	Iowa	19187	Low	Mod	Mod	Mod	NOQ3	Mod
Winnebago	Iowa	19189	Low	Low	Mod	Mod	NOQ3	High
Winneshiek	Iowa	19191	Low	Mod	Mod	Mod	NOQ3	High
Woodbury	Iowa	19193	Low	Mod	Mod	Mod	Q3	Mod
Worth	Iowa	19195	Low	Low	Mod	Mod	NOQ3	High
Wright	Iowa	19197	Low	Low	Mod	Mod	NOQ3	High
Allen	Kansas	20001	Low	Low	Mod	Mod	NOQ3	High
Anderson	Kansas	20003	Low	Low	Low	Low	NOQ3	High
Atchison	Kansas	20005	Low	Mod	Mod	Mod	NOQ3	Mod
Barber	Kansas	20007	Low	Low	Low	Low	NOQ3	Mod
Barton	Kansas	20009	Low	Mod	Mod	Mod	Q3	Mod
Bourbon	Kansas	20011	Low	Low	Low	Low	NOQ3	High
Brown	Kansas	20013	Low	Mod	Mod	Mod	NOQ3	Mod
Butler	Kansas	20015	Low	Low	Mod	Mod	Q3	Mod
Chase	Kansas	20017	Low	Low	Mod	Mod	NOQ3	Mod
Chautauqua	Kansas	20019	Low	Mod	Low	Low	NOQ3	High
Cherokee	Kansas	20021	Low	Low	Mod	Mod	NOQ3	High
Cheyenne	Kansas	20023	Low	Mod	Low	Low	NOQ3	Mod
Clark	Kansas	20025	Low	Low	Low	Low	NOQ3	Mod
Clay	Kansas	20027	Low	Mod	Mod	Mod	NOQ3	Mod
Cloud	Kansas	20029	Low	Mod	Mod	Mod	NOQ3	Mod
Coffey	Kansas	20031	Low	Low	Mod	Mod	NOQ3	High
Comanche	Kansas	20033	Low	Low	Low	Low	NOQ3	Mod
Cowley	Kansas	20035	Low	Low	Mod	Mod	NOQ3	High
Crawford	Kansas	20037	Low	Low	Mod	Mod	NOQ3	High
Decatur	Kansas	20039	Low	Low	Mod	Mod	NOQ3	Mod
Dickinson	Kansas	20041	Low	Mod	Mod	Mod	NOQ3	Mod
Doniphan	Kansas	20043	Low	Mod	Mod	Mod	NOQ3	Mod
Douglas	Kansas	20045	Low	Mod	Mod	Mod	Q3	Mod
Edwards	Kansas	20047	Low	Mod	Mod	Mod	NOQ3	Mod
Elk	Kansas	20049	Low	Low	Mod	Mod	NOQ3	High
Ellis	Kansas	20051	Low	Mod	Mod	Mod	NOQ3	Mod
Ellsworth	Kansas	20053	Low	Mod	Mod	Mod	NOQ3	Mod
Finney	Kansas	20055	Low	Low	Mod	Mod	NOQ3	Mod
Ford	Kansas	20057	Low	Mod	Mod	Mod	NOQ3	Mod
Franklin	Kansas	20059	Low	Low	Mod	Mod	NOQ3	High
Geary	Kansas	20061	Mod	Low	Low	Low	NOQ3	Mod
Gove	Kansas	20063	Low	Low	Low	Low	NOQ3	Mod
Graham	Kansas	20065	Low	Low	Mod	Mod	NOQ3	Mod
Grant	Kansas	20067	Low	Low	Low	Low	NOQ3	Mod
Gray	Kansas	20069	Low	Low	Low	Low	NOQ3	Mod
Greeley	Kansas	20071	Low	Low	Low	Low	NOQ3	Mod

County	State	FIPS	EQ	LS	Wind	Torn	Flood	Icing
Greenwood	Kansas	20073	Low	Low	Mod	Mod	NOQ3	High
Hamilton	Kansas	20075	Low	High	Low	Low	NOQ3	Mod
Harper	Kansas	20077	Low	Low	Mod	Mod	NOQ3	Mod
Harvey	Kansas	20079	Low	Low	Mod	Mod	NOQ3	Mod
Haskell	Kansas	20081	Low	Low	Mod	Mod	NOQ3	Mod
Hodgeman	Kansas	20083	Low	Mod	Mod	Mod	NOQ3	Mod
Jackson	Kansas	20085	Mod	Low	Mod	Mod	NOQ3	Mod
Jefferson	Kansas	20087	Low	Mod	Mod	Mod	NOQ3	Mod
Jewell	Kansas	20089	Low	Mod	Mod	Mod	NOQ3	Mod
Johnson	Kansas	20091	Low	Mod	Mod	Mod	Q3	High
Kearny	Kansas	20093	Low	Low	Mod	Mod	NOQ3	Mod
Kingman	Kansas	20095	Low	Low	Mod	Mod	NOQ3	Mod
Kiowa	Kansas	20097	Low	Low	Low	Low	NOQ3	Mod
Labette	Kansas	20099	Low	Low	Low	Low	NOQ3	High
Lane	Kansas	20101	Low	Low	Mod	Mod	NOQ3	Mod
Leavenworth	Kansas	20103	Low	Mod	Mod	Mod	NOQ3	Mod
Lincoln	Kansas	20105	Low	Mod	Low	Low	NOQ3	Mod
Linn	Kansas	20107	Low	Low	Low	Low	NOQ3	High
Logan	Kansas	20109	Low	Low	Low	Low	NOQ3	Mod
Lyon	Kansas	20111	Low	Low	Mod	Mod	NOQ3	Mod
Marion	Kansas	20115	Low	Mod	Mod	Mod	NOQ3	Mod
Marshall	Kansas	20117	Mod	Mod	Mod	Mod	NOQ3	Mod
Mcpherson	Kansas	20113	Low	Mod	Mod	Mod	NOQ3	Mod
Meade	Kansas	20119	Low	Low	Mod	Mod	NOQ3	Mod
Miami	Kansas	20121	Low	Low	Mod	Mod	NOQ3	High
Mitchell	Kansas	20123	Low	Mod	Mod	Mod	NOQ3	Mod
Montgomery	Kansas	20125	Low	Low	Mod	Mod	NOQ3	High
Morris	Kansas	20127	Mod	Low	Mod	Mod	NOQ3	Mod
Morton	Kansas	20129	Low	Low	Low	Low	NOQ3	Mod
Nemaha	Kansas	20131	Mod	Low	Low	Low	NOQ3	Mod
Neosho	Kansas	20133	Low	Low	Mod	Mod	NOQ3	High
Ness	Kansas	20135	Low	Low	Mod	Mod	NOQ3	Mod
Norton	Kansas	20137	Low	Low	Low	Low	NOQ3	Mod
Osage	Kansas	20139	Low	Low	Mod	Mod	NOQ3	Mod
Osborne	Kansas	20141	Low	Mod	Mod	Mod	NOQ3	Mod
Ottawa	Kansas	20143	Low	Mod	Low	Low	NOQ3	Mod
Pawnee	Kansas	20145	Low	Mod	Mod	Mod	NOQ3	Mod
Phillips	Kansas	20147	Low	Low	Mod	Mod	NOQ3	Mod
Pottawatomie	Kansas	20149	Mod	Low	Mod	Mod	NOQ3	Mod
Pratt	Kansas	20151	Low	Low	Mod	Mod	NOQ3	Mod
Rawlins	Kansas	20153	Low	Low	Mod	Mod	NOQ3	Mod
Reno	Kansas	20155	Low	Low	Mod	Mod	Q3	Mod
Republic	Kansas	20157	Low	Mod	Mod	Mod	NOQ3	Mod
Rice	Kansas	20159	Low	Mod	Mod	Mod	NOQ3	Mod
Riley	Kansas	20161	Mod	Low	Mod	Mod	NOQ3	Mod
Rooks	Kansas	20163	Low	Mod	Mod	Mod	NOQ3	Mod
Rush	Kansas	20165	Low	Mod	Mod	Mod	NOQ3	Mod

County	State	FIPS	EQ	LS	Wind	Torn	Flood	Icing
Russell	Kansas	20167	Low	Mod	Mod	Mod	NOQ3	Mod
Saline	Kansas	20169	Low	Mod	Mod	Mod	Q3	Mod
Scott	Kansas	20171	Low	Low	Mod	Mod	NOQ3	Mod
Sedgwick	Kansas	20173	Low	Low	Mod	Mod	Q3	Mod
Seward	Kansas	20175	Low	Low	Mod	Mod	NOQ3	Mod
Shawnee	Kansas	20177	Mod	Low	Mod	Mod	Q3	Mod
Sheridan	Kansas	20179	Low	Low	Low	Low	NOQ3	Mod
Sherman	Kansas	20181	Low	Low	Mod	Mod	NOQ3	Mod
Smith	Kansas	20183	Low	Low	Mod	Mod	NOQ3	Mod
Stafford	Kansas	20185	Low	Low	Mod	Mod	NOQ3	Mod
Stanton	Kansas	20187	Low	Low	Mod	Mod	NOQ3	Mod
Stevens	Kansas	20189	Low	Low	Low	Low	NOQ3	Mod
Sumner	Kansas	20191	Low	Low	Mod	Mod	NOQ3	Mod
Thomas	Kansas	20193	Low	Low	Mod	Mod	NOQ3	Mod
Trego	Kansas	20195	Low	Low	Mod	Mod	NOQ3	Mod
Wabaunsee	Kansas	20197	Mod	Low	Mod	Mod	NOQ3	Mod
Wallace	Kansas	20199	Low	Low	Low	Low	NOQ3	Mod
Washington	Kansas	20201	Low	Mod	Low	Low	NOQ3	Mod
Wichita	Kansas	20203	Low	Low	Mod	Mod	NOQ3	Mod
Wilson	Kansas	20205	Low	Low	Low	Low	NOQ3	High
Woodson	Kansas	20207	Low	Low	Low	Low	NOQ3	High
Wyandotte	Kansas	20209	Low	Mod	Mod	Mod	NOQ3	Mod
Adair	Kentucky	21001	Low	Mod	Low	Low	NOQ3	Mod
Allen	Kentucky	21003	Mod	Low	Low	Low	NOQ3	Mod
Anderson	Kentucky	21005	Mod	Low	Mod	Mod	Q3	Mod
Ballard	Kentucky	21007	High	High	Low	Low	Q3	High
Barren	Kentucky	21009	Mod	Low	Low	Low	Q3	Mod
Bath	Kentucky	21011	Mod	High	Low	Low	Q3	Mod
Bell	Kentucky	21013	Mod	High	Low	Low	Q3	Mod
Boone	Kentucky	21015	Low	High	Mod	Mod	Q3	Mod
Bourbon	Kentucky	21017	Mod	Low	Low	Low	Q3	Mod
Boyd	Kentucky	21019	Mod	High	Low	Low	Q3	Mod
Boyle	Kentucky	21021	Low	Mod	Mod	Mod	Q3	Mod
Bracken	Kentucky	21023	Mod	High	Low	Low	Q3	Mod
Breathitt	Kentucky	21025	Mod	High	Low	Low	Q3	Mod
Breckinridge	Kentucky	21027	Mod	Mod	Low	Low	Q3	Mod
Bullitt	Kentucky	21029	Mod	Mod	Low	Low	Q3	Mod
Butler	Kentucky	21031	Mod	Low	Low	Low	Q3	Mod
Caldwell	Kentucky	21033	Mod	Low	Low	Low	Q3	Mod
Calloway	Kentucky	21035	High	Low	Mod	Mod	Q3	High
Campbell	Kentucky	21037	Low	High	Low	Low	Q3	Mod
Carlisle	Kentucky	21039	High	High	Low	Low	Q3	High
Carroll	Kentucky	21041	Low	High	Mod	Mod	Q3	Mod
Carter	Kentucky	21043	Mod	High	Low	Low	Q3	Mod
Casey	Kentucky	21045	Low	Mod	Low	Low	Q3	Mod
Christian	Kentucky	21047	Mod	Low	Low	Low	Q3	Mod
Clark	Kentucky	21049	Mod	Low	Low	Low	Q3	Mod

County	State	FIPS	EQ	LS	Wind	Torn	Flood	Icing
Clay	Kentucky	21051	Mod	High	Low	Low	Q3	Mod
Clinton	Kentucky	21053	Mod	High	Low	Low	NOQ3	Mod
Crittenden	Kentucky	21055	Mod	Low	Low	Low	Q3	High
Cumberland	Kentucky	21057	Low	Mod	Low	Low	NOQ3	Mod
Daviess	Kentucky	21059	Mod	Mod	Low	Low	Q3	Mod
Edmonson	Kentucky	21061	Mod	Low	Low	Low	Q3	Mod
Elliott	Kentucky	21063	Mod	High	Low	Low	NOQ3	Mod
Estill	Kentucky	21065	Mod	High	Low	Low	Q3	Mod
Fayette	Kentucky	21067	Mod	Low	Mod	Mod	Q3	Mod
Fleming	Kentucky	21069	Mod	High	Low	Low	Q3	Mod
Floyd	Kentucky	21071	Mod	High	Low	Low	Q3	Mod
Franklin	Kentucky	21073	Mod	Low	Mod	Mod	Q3	Mod
Fulton	Kentucky	21075	High	High	Low	Low	Q3	High
Gallatin	Kentucky	21077	Low	High	Low	Low	Q3	Mod
Garrard	Kentucky	21079	Mod	High	Low	Low	NOQ3	Mod
Grant	Kentucky	21081	Mod	Low	Low	Low	NOQ3	Mod
Graves	Kentucky	21083	High	Low	Low	Low	Q3	High
Grayson	Kentucky	21085	Mod	Low	Low	Low	Q3	Mod
Green	Kentucky	21087	Low	Low	Low	Low	Q3	Mod
Greenup	Kentucky	21089	Mod	High	Low	Low	Q3	Mod
Hancock	Kentucky	21091	Mod	Mod	Mod	Mod	Q3	Mod
Hardin	Kentucky	21093	Mod	Mod	Low	Low	Q3	Mod
Harlan	Kentucky	21095	Mod	High	Low	Low	Q3	Mod
Harrison	Kentucky	21097	Mod	Low	Low	Low	Q3	Mod
Hart	Kentucky	21099	Mod	Low	Low	Low	Q3	Mod
Henderson	Kentucky	21101	Mod	Mod	Low	Low	Q3	High
Henry	Kentucky	21103	Low	Low	Mod	Mod	Q3	Mod
Hickman	Kentucky	21105	High	High	Low	Low	Q3	High
Hopkins	Kentucky	21107	Mod	Mod	Low	Low	Q3	Mod
Jackson	Kentucky	21109	Mod	High	Low	Low	NOQ3	Mod
Jefferson	Kentucky	21111	Mod	Mod	Low	Low	Q3	Mod
Jessamine	Kentucky	21113	Mod	Low	Low	Low	Q3	Mod
Johnson	Kentucky	21115	Mod	High	Low	Low	Q3	Mod
Kenton	Kentucky	21117	Low	High	Mod	Mod	Q3	Mod
Knott	Kentucky	21119	Mod	High	Low	Low	Q3	Mod
Knox	Kentucky	21121	Mod	High	Low	Low	NOQ3	Mod
Larue	Kentucky	21123	Mod	Mod	Low	Low	Q3	Mod
Laurel	Kentucky	21125	Mod	High	Mod	Mod	NOQ3	Mod
Lawrence	Kentucky	21127	Mod	High	Low	Low	Q3	Mod
Lee	Kentucky	21129	Mod	High	Low	Low	Q3	Mod
Leslie	Kentucky	21131	Mod	High	Low	Low	Q3	Mod
Letcher	Kentucky	21133	Mod	High	Low	Low	Q3	Mod
Lewis	Kentucky	21135	Mod	High	Low	Low	Q3	Mod
Lincoln	Kentucky	21137	Mod	High	Low	Low	NOQ3	Mod
Livingston	Kentucky	21139	High	Low	Low	Low	Q3	High
Logan	Kentucky	21141	Mod	Low	Low	Low	Q3	Mod
Lyon	Kentucky	21143	Mod	Low	Low	Low	NOQ3	High

County	State	FIPS	EQ	LS	Wind	Torn	Flood	Icing
Madison	Kentucky	21151	Mod	High	Low	Low	NOQ3	Mod
Magoffin	Kentucky	21153	Mod	High	Low	Low	Q3	Mod
Marion	Kentucky	21155	Low	Mod	Low	Low	Q3	Mod
Marshall	Kentucky	21157	High	Low	Mod	Mod	Q3	High
Martin	Kentucky	21159	Mod	High	Low	Low	Q3	Mod
Mason	Kentucky	21161	Mod	High	Low	Low	Q3	Mod
McCracken	Kentucky	21145	High	Low	Low	Low	Q3	High
McCreary	Kentucky	21147	Mod	High	Low	Low	NOQ3	Mod
McLean	Kentucky	21149	Mod	Mod	Low	Low	Q3	Mod
Meade	Kentucky	21163	Mod	Mod	Low	Low	Q3	Mod
Menifee	Kentucky	21165	Mod	High	Low	Low	NOQ3	Mod
Mercer	Kentucky	21167	Mod	Mod	Mod	Mod	Q3	Mod
Metcalfe	Kentucky	21169	Low	Low	Low	Low	Q3	Mod
Monroe	Kentucky	21171	Mod	Mod	Low	Low	NOQ3	Mod
Montgomery	Kentucky	21173	Mod	Mod	Low	Low	Q3	Mod
Morgan	Kentucky	21175	Mod	High	Low	Low	Q3	Mod
Muhlenberg	Kentucky	21177	Mod	Mod	Low	Low	Q3	Mod
Nelson	Kentucky	21179	Low	Mod	Low	Low	Q3	Mod
Nicholas	Kentucky	21181	Mod	Low	Low	Low	Q3	Mod
Ohio	Kentucky	21183	Mod	Mod	Low	Low	Q3	Mod
Oldham	Kentucky	21185	Low	Low	Mod	Mod	Q3	Mod
Owen	Kentucky	21187	Mod	Low	Low	Low	Q3	Mod
Owsley	Kentucky	21189	Mod	High	Low	Low	NOQ3	Mod
Pendleton	Kentucky	21191	Mod	High	Low	Low	Q3	Mod
Perry	Kentucky	21193	Mod	High	Low	Low	Q3	Mod
Pike	Kentucky	21195	Mod	High	Low	Low	Q3	Mod
Powell	Kentucky	21197	Mod	High	Low	Low	Q3	Mod
Pulaski	Kentucky	21199	Mod	High	Low	Low	NOQ3	Mod
Robertson	Kentucky	21201	Mod	Low	Low	Low	Q3	Mod
Rockcastle	Kentucky	21203	Mod	High	Low	Low	NOQ3	Mod
Rowan	Kentucky	21205	Mod	High	Low	Low	Q3	Mod
Russell	Kentucky	21207	Low	Mod	Low	Low	Q3	Mod
Scott	Kentucky	21209	Mod	Low	Mod	Mod	Q3	Mod
Shelby	Kentucky	21211	Low	Low	Mod	Mod	Q3	Mod
Simpson	Kentucky	21213	Mod	Low	Mod	Mod	Q3	Mod
Spencer	Kentucky	21215	Low	Mod	Low	Low	Q3	Mod
Taylor	Kentucky	21217	Low	Mod	Low	Low	Q3	Mod
Todd	Kentucky	21219	Mod	Low	Low	Low	Q3	Mod
Trigg	Kentucky	21221	Mod	Low	Low	Low	Q3	High
Trimble	Kentucky	21223	Low	Low	Mod	Mod	Q3	Mod
Union	Kentucky	21225	Mod	Mod	Low	Low	Q3	High
Warren	Kentucky	21227	Mod	Low	Mod	Mod	Q3	Mod
Washington	Kentucky	21229	Low	Low	Low	Low	Q3	Mod
Wayne	Kentucky	21231	Mod	High	Low	Low	NOQ3	Mod
Webster	Kentucky	21233	Mod	Mod	Low	Low	Q3	Mod
Whitley	Kentucky	21235	Mod	High	Low	Low	NOQ3	Mod
Wolfe	Kentucky	21237	Mod	High	Low	Low	NOQ3	Mod

County	State	FIPS	EQ	LS	Wind	Torn	Flood	Icing
Woodford	Kentucky	21239	Mod	Low	Low	Low	Q3	Mod
Acadia	Louisiana	22001	Low	Low	High	Mod	Q3	Mod
Allen	Louisiana	22003	Low	Low	Mod	Low	Q3	Mod
Ascension	Louisiana	22005	Low	High	High	Mod	Q3	Low
Assumption	Louisiana	22007	Low	High	High	Mod	Q3	Low
Avoyelles	Louisiana	22009	Low	High	Mod	Mod	Q3	Mod
Beauregard	Louisiana	22011	Low	Low	Mod	Low	NOQ3	Mod
Bienville	Louisiana	22013	Low	Low	Mod	Mod	NOQ3	Mod
Bossier	Louisiana	22015	Low	Low	Mod	Mod	Q3	Mod
Caddo	Louisiana	22017	Low	Low	Mod	Mod	NOQ3	Mod
Calcasieu	Louisiana	22019	Low	Low	High	Mod	Q3	Mod
Caldwell	Louisiana	22021	Low	Mod	Low	Low	NOQ3	Mod
Cameron	Louisiana	22023	Low	Mod	High	Low	Q3	Mod
Catahoula	Louisiana	22025	Low	High	Mod	Low	Q3	Mod
Claiborne	Louisiana	22027	Low	Low	Low	Low	NOQ3	Mod
Concordia	Louisiana	22029	Low	High	Mod	Mod	Q3	Mod
De Soto	Louisiana	22031	Low	Low	Mod	Mod	NOQ3	Mod
East Baton Rouge	Louisiana	22033	Low	High	Mod	Mod	Q3	Low
East Carroll	Louisiana	22035	Mod	High	Mod	Mod	NOQ3	Mod
East Feliciana	Louisiana	22037	Low	High	Mod	Mod	NOQ3	Mod
Evangeline	Louisiana	22039	Low	Low	Mod	Low	NOQ3	Mod
Franklin	Louisiana	22041	Low	High	Mod	Mod	Q3	Mod
Grant	Louisiana	22043	Low	Low	Mod	Low	Q3	Mod
Iberia	Louisiana	22045	Low	Mod	High	Mod	Q3	Mod
Iberville	Louisiana	22047	Low	High	High	Low	Q3	Mod
Jackson	Louisiana	22049	Low	Low	Mod	Mod	NOQ3	Mod
Jefferson	Louisiana	22051	Low	Mod	High	Mod	Q3	Low
Jefferson Davis	Louisiana	22053	Low	Low	High	Mod	NOQ3	Mod
La Salle	Louisiana	22059	Low	Low	Mod	Low	NOQ3	Mod
Lafayette	Louisiana	22055	Low	Low	High	Mod	Q3	Mod
LaFourche	Louisiana	22057	Low	Mod	High	Low	Q3	Low
Lincoln	Louisiana	22061	Low	Low	Mod	Mod	NOQ3	Mod
Livingston	Louisiana	22063	Low	Mod	High	Mod	Q3	Low
Madison	Louisiana	22065	Low	High	Mod	Mod	Q3	Mod
Morehouse	Louisiana	22067	Mod	Low	Mod	Mod	NOQ3	Mod
Natchitoches	Louisiana	22069	Low	Low	Mod	Low	Q3	Mod
Orleans	Louisiana	22071	Low	Mod	High	Mod	Q3	Low
Ouachita	Louisiana	22073	Low	Mod	Mod	Mod	Q3	Mod
Plaquemines	Louisiana	22075	Low	Mod	High	Low	Q3	Low
Pointe Coupee	Louisiana	22077	Low	High	Mod	Low	Q3	Mod
Rapides	Louisiana	22079	Low	Low	Mod	Mod	Q3	Mod
Red River	Louisiana	22081	Low	Low	Low	Low	NOQ3	Mod
Richland	Louisiana	22083	Low	Low	Mod	Mod	NOQ3	Mod
Sabine	Louisiana	22085	Low	Low	Mod	Low	NOQ3	Mod
St. Bernard	Louisiana	22087	Low	Mod	High	Low	Q3	Low
St. Charles	Louisiana	22089	Low	Mod	High	Low	Q3	Low
St. Helena	Louisiana	22091	Low	Mod	Mod	Mod	NOQ3	Low

County	State	FIPS	EQ	LS	Wind	Torn	Flood	Icing
St. James	Louisiana	22093	Low	High	High	Low	Q3	Low
St. John the Baptist	Louisiana	22095	Low	Mod	High	Mod	Q3	Low
St. Landry	Louisiana	22097	Low	High	Mod	Mod	Q3	Mod
St. Martin	Louisiana	22099	Low	High	High	Low	Q3	Mod
St. Mary	Louisiana	22101	Low	Mod	High	Low	Q3	Low
St. Tammany	Louisiana	22103	Low	Mod	High	Low	Q3	Low
Tangipahoa	Louisiana	22105	Low	Mod	High	Mod	Q3	Low
Tensas	Louisiana	22107	Low	High	Mod	Mod	NOQ3	Mod
Terrebonne	Louisiana	22109	Low	Mod	High	Low	Q3	Low
Union	Louisiana	22111	Low	Low	Mod	Mod	NOQ3	Mod
Vermilion	Louisiana	22113	Low	Low	High	Mod	Q3	Mod
Vernon	Louisiana	22115	Low	Low	Mod	Low	NOQ3	Mod
Washington	Louisiana	22121	Low	High	Mod	Mod	NOQ3	Low
Webster	Louisiana	22117	Low	Mod	High	Low	NOQ3	Mod
West Baton Rouge	Louisiana	22119	Low	Low	Mod	Mod	NOQ3	Low
West Carroll	Louisiana	22123	Mod	Low	Mod	Mod	NOQ3	Mod
West Feliciana	Louisiana	22125	Low	High	Mod	Low	NOQ3	Mod
Winn	Louisiana	22127	Low	Low	Low	Low	NOQ3	Mod
Androscoggin	Maine	23001	Mod	Mod	Mod	Low	NOQ3	High
Aroostook	Maine	23003	Mod	Low	Low	Low	NOQ3	Mod
Cumberland	Maine	23005	Mod	High	Mod	Low	Q3	High
Franklin	Maine	23007	Mod	High	Low	Low	NOQ3	High
Hancock	Maine	23009	Mod	Mod	Mod	Low	Q3	High
Kennebec	Maine	23011	Mod	Mod	Mod	Low	Q3	High
Knox	Maine	23013	Mod	Mod	Mod	Low	NOQ3	High
Lincoln	Maine	23015	Mod	Mod	High	Low	NOQ3	High
Oxford	Maine	23017	Mod	High	Low	Low	Q3	High
Penobscot	Maine	23019	Mod	High	Mod	Low	Q3	High
Piscataquis	Maine	23021	Mod	High	Low	Low	NOQ3	Mod
Sagadahoc	Maine	23023	Mod	Mod	Mod	Low	Q3	High
Somerset	Maine	23025	Mod	High	Low	Low	NOQ3	High
Waldo	Maine	23027	Mod	Mod	Mod	Low	Q3	High
Washington	Maine	23029	Mod	Mod	Mod	Low	Q3	High
York	Maine	23031	Mod	High	Mod	Low	Q3	High
Allegany	Maryland	24001	Low	High	Low	Low	Q3	Mod
Anne Arundel	Maryland	24003	Low	High	Mod	Mod	Q3	Mod
Baltimore	Maryland	24005	Mod	High	Low	Low	Q3	Mod
Baltimore City	Maryland	24510	Low	High	Low	Low	Q3	Mod
Calvert	Maryland	24009	Low	Mod	Mod	Mod	Q3	Mod
Caroline	Maryland	24011	Low	Low	Mod	Low	NOQ3	Mod
Carroll	Maryland	24013	Mod	High	Low	Low	Q3	Mod
Cecil	Maryland	24015	Mod	Mod	Mod	Mod	Q3	Mod
Charles	Maryland	24017	Low	High	Low	Low	NOQ3	Mod
Dorchester	Maryland	24019	Low	Low	High	Low	Q3	Mod
Frederick	Maryland	24021	Low	High	Mod	Mod	Q3	Mod
Garrett	Maryland	24023	Low	High	Low	Low	NOQ3	Mod
Harford	Maryland	24025	Mod	Mod	Mod	Mod	Q3	Mod

County	State	FIPS	EQ	LS	Wind	Torn	Flood	Icing
Howard	Maryland	24027	Low	High	Low	Low	NOQ3	Mod
Kent	Maryland	24029	Mod	Mod	Low	Low	Q3	Mod
Montgomery	Maryland	24031	Low	Low	Low	Low	NOQ3	Mod
Prince Georges	Maryland	24033	Low	High	Low	Low	Q3	Mod
Queen Annes	Maryland	24035	Mod	Low	Mod	Low	Q3	Mod
Somerset	Maryland	24039	Low	Low	High	Low	Q3	Mod
St. Marys	Maryland	24037	Low	Low	Mod	Mod	Q3	Mod
Talbot	Maryland	24041	Low	Low	Mod	Low	Q3	Mod
Washington	Maryland	24043	Low	High	Low	Low	Q3	Mod
Wicomico	Maryland	24045	Low	Low	High	Low	Q3	Mod
Worcester	Maryland	24047	Low	Low	High	Low	Q3	Mod
Barnstable	Massachusetts	25001	Mod	Low	High	Low	Q3	Mod
Berkshire	Massachusetts	25003	Mod	High	Mod	Low	Q3	Mod
Bristol	Massachusetts	25005	Mod	Mod	High	Low	Q3	Mod
Dukes	Massachusetts	25007	Mod	High	High	Low	Q3	Mod
Essex	Massachusetts	25009	Mod	High	High	Mod	Q3	High
Franklin	Massachusetts	25011	Mod	High	Mod	Mod	NOQ3	High
Hampden	Massachusetts	25013	Mod	High	Mod	Mod	Q3	High
Hampshire	Massachusetts	25015	Mod	High	Mod	Low	Q3	High
Middlesex	Massachusetts	25017	Mod	Mod	Mod	Low	Q3	High
Nantucket	Massachusetts	25019	Low	Mod	High	Low	Q3	Mod
Norfolk	Massachusetts	25021	Mod	Mod	High	Low	Q3	Mod
Plymouth	Massachusetts	25023	Mod	Mod	High	Low	Q3	Mod
Suffolk	Massachusetts	25025	Mod	Mod	High	Low	Q3	High
Worcester	Massachusetts	25027	Mod	Mod	Mod	Low	Q3	High
Alcona	Michigan	26001	Low	Mod	Low	Low	NOQ3	Mod
Alger	Michigan	26003	Low	Mod	Low	Low	NOQ3	Mod
Allegan	Michigan	26005	Low	Mod	Mod	Mod	NOQ3	Mod
Alpena	Michigan	26007	Low	Low	Low	Low	Q3	Mod
Antrim	Michigan	26009	Low	Mod	Low	Low	NOQ3	Mod
Arenac	Michigan	26011	Low	Mod	Low	Low	Q3	Mod
Baraga	Michigan	26013	Low	High	Low	Low	NOQ3	Mod
Barry	Michigan	26015	Low	Low	Mod	Mod	NOQ3	Mod
Bay	Michigan	26017	Low	Mod	Low	Low	Q3	Mod
Benzie	Michigan	26019	Low	Mod	Low	Low	NOQ3	Mod
Berrien	Michigan	26021	Low	Mod	Mod	Mod	Q3	Mod
Branch	Michigan	26023	Low	Low	Mod	Mod	NOQ3	High
Calhoun	Michigan	26025	Low	Low	Low	Low	Q3	Mod
Cass	Michigan	26027	Low	Low	Low	Low	NOQ3	Mod
Charlevoix	Michigan	26029	Low	Low	Low	Low	NOQ3	Mod
Cheboygan	Michigan	26031	Low	Mod	Low	Low	NOQ3	Mod
Chippewa	Michigan	26033	Low	High	Low	Low	Q3	Mod
Clare	Michigan	26035	Low	Low	Low	Low	Q3	Mod
Clinton	Michigan	26037	Low	Low	Mod	Mod	Q3	Mod
Crawford	Michigan	26039	Low	Low	Low	Low	NOQ3	Mod
Delta	Michigan	26041	Low	Mod	Low	Low	Q3	Mod
Dickinson	Michigan	26043	Low	Low	Low	Low	NOQ3	Mod

County	State	FIPS	EQ	LS	Wind	Torn	Flood	Icing
Eaton	Michigan	26045	Low	Low	Mod	Mod	NOQ3	Mod
Emmet	Michigan	26047	Low	Mod	Low	Low	NOQ3	Mod
Genesee	Michigan	26049	Low	Mod	Mod	Mod	Q3	Mod
Gladwin	Michigan	26051	Low	Mod	Low	Low	NOQ3	Mod
Gogebic	Michigan	26053	Low	High	Low	Low	NOQ3	Mod
Grand Traverse	Michigan	26055	Low	Mod	Low	Low	NOQ3	Mod
Gratiot	Michigan	26057	Low	Low	Low	Low	NOQ3	Mod
Hillsdale	Michigan	26059	Low	Low	Mod	Mod	NOQ3	High
Houghton	Michigan	26061	Low	High	Low	Low	NOQ3	Mod
Huron	Michigan	26063	Low	Mod	Low	Low	Q3	Mod
Ingham	Michigan	26065	Low	Low	Mod	Mod	Q3	Mod
Ionia	Michigan	26067	Low	Low	Mod	Mod	NOQ3	Mod
Iosco	Michigan	26069	Low	Mod	Low	Low	Q3	Mod
Iron	Michigan	26071	Low	Low	Low	Low	NOQ3	Mod
Isabella	Michigan	26073	Low	Low	Low	Low	Q3	Mod
Jackson	Michigan	26075	Low	Low	Low	Low	NOQ3	High
Kalamazoo	Michigan	26077	Low	Low	Mod	Mod	NOQ3	Mod
Kalkaska	Michigan	26079	Low	Mod	Low	Low	NOQ3	Mod
Kent	Michigan	26081	Low	Low	Mod	Mod	Q3	Mod
Keweenaw	Michigan	26083	Low	High	Low	Low	Q3	Mod
Lake	Michigan	26085	Low	Low	Low	Low	NOQ3	Mod
Lapeer	Michigan	26087	Low	Low	Low	Low	NOQ3	Mod
Leelanau	Michigan	26089	Low	Mod	Low	Low	NOQ3	Mod
Lenawee	Michigan	26091	Low	Low	Mod	Mod	NOQ3	High
Livingston	Michigan	26093	Low	Low	Mod	Mod	Q3	High
Luce	Michigan	26095	Low	Mod	Low	Low	NOQ3	Mod
Mackinac	Michigan	26097	Low	High	Low	Low	Q3	Mod
Macomb	Michigan	26099	Low	Mod	Mod	Mod	Q3	High
Manistee	Michigan	26101	Low	Mod	Low	Low	Q3	Mod
Marquette	Michigan	26103	Low	High	Low	Low	NOQ3	Mod
Mason	Michigan	26105	Low	Mod	Low	Low	NOQ3	Mod
Mecosta	Michigan	26107	Low	Low	Low	Low	NOQ3	Mod
Menominee	Michigan	26109	Low	Low	Low	Low	Q3	Mod
Midland	Michigan	26111	Low	Mod	Low	Low	Q3	Mod
Missaukee	Michigan	26113	Low	Low	Low	Low	NOQ3	Mod
Monroe	Michigan	26115	Low	Mod	Mod	Mod	Q3	High
Montcalm	Michigan	26117	Low	Low	Low	Low	NOQ3	Mod
Montmorency	Michigan	26119	Low	Low	Low	Low	NOQ3	Mod
Muskegon	Michigan	26121	Low	Mod	Low	Low	Q3	Mod
Newaygo	Michigan	26123	Low	Low	Low	Low	NOQ3	Mod
Oakland	Michigan	26125	Low	Mod	Mod	Mod	Q3	High
Oceana	Michigan	26127	Low	Mod	Low	Low	NOQ3	Mod
Ogemaw	Michigan	26129	Low	Low	Low	Low	NOQ3	Mod
Ontonagon	Michigan	26131	Low	High	Low	Low	NOQ3	Mod
Osceola	Michigan	26133	Low	Low	Low	Low	NOQ3	Mod
Oscoda	Michigan	26135	Low	Low	Low	Low	NOQ3	Mod
Otsego	Michigan	26137	Low	Low	Low	Low	NOQ3	Mod

County	State	FIPS	EQ	LS	Wind	Torn	Flood	Icing
Ottawa	Michigan	26139	Low	Mod	Mod	Mod	NOQ3	Mod
Presque Isle	Michigan	26141	Low	Mod	Low	Low	NOQ3	Mod
Roscommon	Michigan	26143	Low	Low	Low	Low	NOQ3	Mod
Saginaw	Michigan	26145	Low	Mod	Low	Low	Q3	Mod
Sanilac	Michigan	26151	Low	Mod	Low	Low	NOQ3	Mod
Schoolcraft	Michigan	26153	Low	Mod	Low	Low	NOQ3	Mod
Shiawassee	Michigan	26155	Low	Low	Mod	Mod	NOQ3	Mod
St. Clair	Michigan	26147	Low	Mod	Low	Low	Q3	High
St. Joseph	Michigan	26149	Low	Low	Low	Low	NOQ3	Mod
Tuscola	Michigan	26157	Low	Mod	Low	Low	NOQ3	Mod
Van Buren	Michigan	26159	Low	Mod	Mod	Mod	NOQ3	Mod
Washtenaw	Michigan	26161	Low	Mod	Mod	Mod	Q3	High
Wayne	Michigan	26163	Low	Mod	Mod	Mod	Q3	High
Wexford	Michigan	26165	Low	Low	Low	Low	NOQ3	Mod
Aitkin	Minnesota	27001	Low	Low	Low	Low	Q3	Mod
Anoka	Minnesota	27003	Low	Low	Mod	Mod	Q3	Mod
Becker	Minnesota	27005	Low	Low	Low	Low	Q3	Mod
Beltrami	Minnesota	27007	Low	Low	Low	Low	Q3	Mod
Benton	Minnesota	27009	Low	Low	Low	Low	Q3	Mod
Big Stone	Minnesota	27011	Low	Low	Low	Low	Q3	Mod
Blue Earth	Minnesota	27013	Low	Mod	Mod	Mod	Q3	High
Brown	Minnesota	27015	Low	Mod	Low	Low	Q3	High
Carlton	Minnesota	27017	Low	High	Low	Low	NOQ3	High
Carver	Minnesota	27019	Low	Mod	Mod	Mod	Q3	Mod
Cass	Minnesota	27021	Low	Low	Low	Low	Q3	Mod
Chippewa	Minnesota	27023	Low	Low	Low	Low	Q3	Mod
Chisago	Minnesota	27025	Low	Low	Low	Low	NOQ3	Mod
Clay	Minnesota	27027	Low	Low	Low	Low	Q3	Mod
Clearwater	Minnesota	27029	Low	Low	Low	Low	NOQ3	Mod
Cook	Minnesota	27031	Low	Low	Low	Low	NOQ3	High
Cottonwood	Minnesota	27033	Low	Low	Low	Low	NOQ3	High
Crow Wing	Minnesota	27035	Low	Low	Low	Low	NOQ3	Mod
Dakota	Minnesota	27037	Low	Mod	Low	Low	Q3	Mod
Dodge	Minnesota	27039	Low	Low	Low	Low	NOQ3	High
Douglas	Minnesota	27041	Low	Low	Low	Low	Q3	Mod
Faribault	Minnesota	27043	Low	Mod	Low	Low	NOQ3	High
Fillmore	Minnesota	27045	Low	Mod	Low	Low	NOQ3	High
Freeborn	Minnesota	27047	Low	Low	Mod	Mod	NOQ3	High
Goodhue	Minnesota	27049	Low	Mod	Low	Low	Q3	High
Grant	Minnesota	27051	Low	Low	Low	Low	Q3	Mod
Hennepin	Minnesota	27053	Low	Mod	Mod	Mod	Q3	Mod
Houston	Minnesota	27055	Low	Mod	Low	Low	Q3	Mod
Hubbard	Minnesota	27057	Low	Low	Low	Low	NOQ3	Mod
Isanti	Minnesota	27059	Low	Low	Low	Low	NOQ3	Mod
Itasca	Minnesota	27061	Low	Low	Low	Low	Q3	Mod
Jackson	Minnesota	27063	Low	Low	Low	Low	NOQ3	High
Kanabec	Minnesota	27065	Low	Low	Low	Low	NOQ3	Mod

County	State	FIPS	EQ	LS	Wind	Torn	Flood	Icing
Kandiyohi	Minnesota	27067	Low	Low	Low	Low	Q3	Mod
Kittson	Minnesota	27069	Low	Low	Low	Low	Q3	Mod
Koochiching	Minnesota	27071	Low	Low	Low	Low	NOQ3	Mod
Lac Qui Parle	Minnesota	27073	Low	Low	Low	Low	Q3	Mod
Lake	Minnesota	27075	Low	Low	Low	Low	NOQ3	High
Lake of the Woods	Minnesota	27077	Low	Low	Low	Low	Q3	Mod
Le Sueur	Minnesota	27079	Low	Mod	Low	Low	Q3	High
Lincoln	Minnesota	27081	Low	Low	Low	Low	Q3	Mod
Lyon	Minnesota	27083	Low	Low	Mod	Mod	Q3	Mod
Mahnomen	Minnesota	27087	Low	Low	Low	Low	Q3	Mod
Marshall	Minnesota	27089	Low	Low	Low	Low	Q3	Mod
Martin	Minnesota	27091	Low	Low	Low	Low	NOQ3	High
McLeod	Minnesota	27085	Low	Low	Low	Low	Q3	Mod
Meeker	Minnesota	27093	Low	Low	Low	Low	NOQ3	Mod
Mille Lacs	Minnesota	27095	Low	Low	Low	Low	NOQ3	Mod
Morrison	Minnesota	27097	Low	Low	Low	Low	Q3	Mod
Mower	Minnesota	27099	Low	Low	Mod	Mod	Q3	High
Murray	Minnesota	27101	Low	Low	Mod	Mod	Q3	High
Nicollet	Minnesota	27103	Low	Mod	Low	Low	Q3	High
Nobles	Minnesota	27105	Low	Low	Low	Low	NOQ3	High
Norman	Minnesota	27107	Low	Low	Low	Low	Q3	Mod
Olmsted	Minnesota	27109	Low	Mod	Mod	Mod	Q3	High
Otter Tail	Minnesota	27111	Low	Low	Low	Low	Q3	Mod
Pennington	Minnesota	27113	Low	Low	Low	Low	Q3	Mod
Pine	Minnesota	27115	Low	Low	Low	Low	NOQ3	Mod
Pipestone	Minnesota	27117	Low	Low	Low	Low	NOQ3	High
Polk	Minnesota	27119	Low	Low	Low	Low	Q3	Mod
Pope	Minnesota	27121	Low	Low	Low	Low	Q3	Mod
Ramsey	Minnesota	27123	Low	Low	Mod	Mod	Q3	Mod
Red Lake	Minnesota	27125	Low	Low	Low	Low	Q3	Mod
Redwood	Minnesota	27127	Low	Mod	Low	Low	Q3	High
Renville	Minnesota	27129	Low	Mod	Low	Low	Q3	Mod
Rice	Minnesota	27131	Low	Low	Low	Low	Q3	High
Rock	Minnesota	27133	Low	Low	Low	Low	NOQ3	High
Roseau	Minnesota	27135	Low	Low	Low	Low	Q3	Mod
Scott	Minnesota	27139	Low	Mod	Low	Low	Q3	Mod
Sherburne	Minnesota	27141	Low	Low	Low	Low	Q3	Mod
Sibley	Minnesota	27143	Low	Mod	Mod	Mod	Q3	Mod
St. Louis	Minnesota	27137	Low	High	Low	Low	Q3	High
Stearns	Minnesota	27145	Low	Low	Low	Low	Q3	Mod
Steele	Minnesota	27147	Low	Low	Mod	Mod	NOQ3	High
Stevens	Minnesota	27149	Low	Low	Low	Low	Q3	Mod
Swift	Minnesota	27151	Low	Low	Low	Low	Q3	Mod
Todd	Minnesota	27153	Low	Low	Low	Low	Q3	Mod
Traverse	Minnesota	27155	Low	Low	Low	Low	Q3	Mod
Wabasha	Minnesota	27157	Low	Mod	Low	Low	Q3	High
Wadena	Minnesota	27159	Low	Low	Low	Low	Q3	Mod

County	State	FIPS	EQ	LS	Wind	Torn	Flood	Icing
Waseca	Minnesota	27161	Low	Mod	Mod	Mod	NOQ3	High
Washington	Minnesota	27163	Low	Low	Low	Low	Q3	Mod
Watonwan	Minnesota	27165	Low	Low	Mod	Mod	NOQ3	High
Wilkin	Minnesota	27167	Low	Low	Low	Low	Q3	Mod
Winona	Minnesota	27169	Low	Mod	Low	Low	Q3	High
Wright	Minnesota	27171	Low	Low	Low	Low	Q3	Mod
Yellow Medicine	Minnesota	27173	Low	Low	Low	Low	Q3	Mod
Adams	Mississippi	28001	Low	High	Mod	Low	NOQ3	Mod
Alcorn	Mississippi	28003	Mod	Low	Mod	Mod	NOQ3	Mod
Amite	Mississippi	28005	Low	High	Mod	Low	NOQ3	Mod
Attala	Mississippi	28007	Mod	Low	Mod	Mod	NOQ3	Mod
Benton	Mississippi	28009	Mod	Low	Low	Low	NOQ3	Mod
Bolivar	Mississippi	28011	Mod	High	Mod	Mod	Q3	Mod
Calhoun	Mississippi	28013	Mod	Low	Low	Low	NOQ3	Mod
Carroll	Mississippi	28015	Mod	High	Low	Low	NOQ3	Mod
Chickasaw	Mississippi	28017	Mod	Low	Mod	Mod	NOQ3	Mod
Choctaw	Mississippi	28019	Mod	Low	Mod	Low	NOQ3	Mod
Claiborne	Mississippi	28021	Low	High	Mod	Mod	Q3	Mod
Clarke	Mississippi	28023	Low	High	Mod	Mod	NOQ3	Low
Clay	Mississippi	28025	Mod	Low	Mod	Mod	NOQ3	Mod
Coahoma	Mississippi	28027	Mod	High	Mod	Mod	NOQ3	High
Copiah	Mississippi	28029	Low	Mod	Mod	Mod	NOQ3	Mod
Covington	Mississippi	28031	Low	Mod	Mod	Mod	NOQ3	Low
De Soto	Mississippi	28033	High	High	Mod	Mod	Q3	High
Forrest	Mississippi	28035	Low	Mod	High	Mod	Q3	Low
Franklin	Mississippi	28037	Low	High	Mod	Low	NOQ3	Mod
George	Mississippi	28039	Low	Mod	High	Low	NOQ3	Low
Greene	Mississippi	28041	Low	Mod	High	Low	NOQ3	Low
Grenada	Mississippi	28043	Mod	High	Mod	Mod	NOQ3	Mod
Hancock	Mississippi	28045	Low	Low	High	Mod	Q3	Low
Harrison	Mississippi	28047	Low	Low	High	Mod	Q3	Low
Hinds	Mississippi	28049	Low	High	Mod	Mod	Q3	Mod
Holmes	Mississippi	28051	Mod	High	Low	Low	NOQ3	Mod
Humphreys	Mississippi	28053	Mod	Low	Mod	Mod	NOQ3	Mod
Issaquena	Mississippi	28055	Mod	High	Mod	Mod	NOQ3	Mod
Itawamba	Mississippi	28057	Mod	Mod	Low	Low	Q3	Mod
Jackson	Mississippi	28059	Low	Low	High	Mod	Q3	Low
Jasper	Mississippi	28061	Low	High	Mod	Mod	NOQ3	Low
Jefferson	Mississippi	28063	Low	High	Mod	Low	NOQ3	Mod
Jefferson Davis	Mississippi	28065	Low	Mod	Mod	Mod	NOQ3	Low
Jones	Mississippi	28067	Low	Mod	Mod	Mod	NOQ3	Low
Kemper	Mississippi	28069	Low	Low	Mod	Low	NOQ3	Mod
Lafayette	Mississippi	28071	Mod	Low	Low	Low	NOQ3	Mod
Lamar	Mississippi	28073	Low	Mod	High	Mod	NOQ3	Low
Lauderdale	Mississippi	28075	Low	Low	Mod	Mod	Q3	Low
Lawrence	Mississippi	28077	Low	Mod	Mod	Mod	NOQ3	Low
Leake	Mississippi	28079	Low	Low	Mod	Mod	NOQ3	Mod

County	State	FIPS	EQ	LS	Wind	Torn	Flood	Icing
Lee	Mississippi	28081	Mod	Low	Mod	Mod	Q3	Mod
Leflore	Mississippi	28083	Mod	Low	Mod	Mod	Q3	Mod
Lincoln	Mississippi	28085	Low	Mod	Mod	Mod	NOQ3	Mod
Lowndes	Mississippi	28087	Mod	Low	Mod	Mod	Q3	Mod
Madison	Mississippi	28089	Low	High	Mod	Mod	Q3	Mod
Marion	Mississippi	28091	Low	Mod	Mod	Mod	NOQ3	Low
Marshall	Mississippi	28093	Mod	Low	Low	Low	NOQ3	High
Monroe	Mississippi	28095	Mod	Low	Mod	Mod	NOQ3	Mod
Montgomery	Mississippi	28097	Mod	Low	Mod	Mod	NOQ3	Mod
Neshoba	Mississippi	28099	Low	Low	Mod	Mod	NOQ3	Mod
Newton	Mississippi	28101	Low	High	Mod	Mod	NOQ3	Low
Noxubee	Mississippi	28103	Low	Low	Mod	Low	NOQ3	Mod
Oktibbeha	Mississippi	28105	Mod	Low	Mod	Low	NOQ3	Mod
Panola	Mississippi	28107	Mod	High	Low	Low	NOQ3	High
Pearl River	Mississippi	28109	Low	Mod	High	Mod	Q3	Low
Perry	Mississippi	28111	Low	Mod	High	Low	NOQ3	Low
Pike	Mississippi	28113	Low	Mod	Mod	Mod	NOQ3	Low
Pontotoc	Mississippi	28115	Mod	Low	Mod	Mod	NOQ3	Mod
Prentiss	Mississippi	28117	Mod	Low	Mod	Mod	Q3	Mod
Quitman	Mississippi	28119	Mod	Low	Low	Low	NOQ3	High
Rankin	Mississippi	28121	Low	High	Mod	Mod	Q3	Mod
Scott	Mississippi	28123	Low	High	Mod	Mod	NOQ3	Mod
Sharkey	Mississippi	28125	Mod	Low	Mod	Mod	NOQ3	Mod
Simpson	Mississippi	28127	Low	Mod	Mod	Mod	NOQ3	Mod
Smith	Mississippi	28129	Low	High	Mod	Mod	NOQ3	Low
Stone	Mississippi	28131	Low	Mod	High	Mod	NOQ3	Low
Sunflower	Mississippi	28133	Mod	Low	Low	Low	NOQ3	Mod
Tallahatchie	Mississippi	28135	Mod	High	Mod	Mod	NOQ3	Mod
Tate	Mississippi	28137	Mod	High	Low	Low	NOQ3	High
Tippah	Mississippi	28139	Mod	Low	Mod	Mod	NOQ3	Mod
Tishomingo	Mississippi	28141	Mod	Mod	Mod	Mod	NOQ3	Mod
Tunica	Mississippi	28143	Mod	High	Low	Low	Q3	High
Union	Mississippi	28145	Mod	Low	Mod	Mod	NOQ3	Mod
Walthall	Mississippi	28147	Low	Mod	Mod	Mod	NOQ3	Low
Warren	Mississippi	28149	Low	High	Mod	Mod	Q3	Mod
Washington	Mississippi	28151	Mod	High	Mod	Mod	Q3	Mod
Wayne	Mississippi	28153	Low	High	Mod	Low	NOQ3	Low
Webster	Mississippi	28155	Mod	Low	Low	Low	NOQ3	Mod
Wilkinson	Mississippi	28157	Low	High	Mod	Low	NOQ3	Mod
Winston	Mississippi	28159	Low	Low	Mod	Low	NOQ3	Mod
Yalobusha	Mississippi	28161	Mod	High	Low	Low	NOQ3	Mod
Yazoo	Mississippi	28163	Mod	High	Mod	Mod	Q3	Mod
Adair	Missouri	29001	Low	Mod	Low	Low	NOQ3	Mod
Andrew	Missouri	29003	Low	Mod	Mod	Mod	NOQ3	Mod
Atchison	Missouri	29005	Low	Mod	Low	Low	NOQ3	Mod
Audrain	Missouri	29007	Low	Mod	Low	Low	NOQ3	High
Barry	Missouri	29009	Low	Low	Low	Low	NOQ3	High

County	State	FIPS	EQ	LS	Wind	Torn	Flood	Icing
Barton	Missouri	29011	Low	Low	Mod	Mod	NOQ3	High
Bates	Missouri	29013	Low	Low	Low	Low	NOQ3	High
Benton	Missouri	29015	Low	Low	Mod	Mod	NOQ3	High
Bollinger	Missouri	29017	High	Low	Low	Low	NOQ3	High
Boone	Missouri	29019	Low	Mod	Mod	Mod	Q3	High
Buchanan	Missouri	29021	Low	Mod	Mod	Mod	Q3	Mod
Butler	Missouri	29023	High	Low	Low	Low	NOQ3	High
Caldwell	Missouri	29025	Low	Mod	Low	Low	NOQ3	Mod
Callaway	Missouri	29027	Mod	Low	Mod	Mod	NOQ3	High
Camden	Missouri	29029	Low	Low	Low	Low	NOQ3	High
Cape Girardeau	Missouri	29031	High	Low	Mod	Mod	Q3	High
Carroll	Missouri	29033	Low	Mod	Low	Low	NOQ3	High
Carter	Missouri	29035	Mod	Low	Low	Low	NOQ3	High
Cass	Missouri	29037	Low	Mod	Mod	Mod	NOQ3	High
Cedar	Missouri	29039	Low	Low	Low	Low	NOQ3	High
Chariton	Missouri	29041	Low	Mod	Low	Low	NOQ3	High
Christian	Missouri	29043	Mod	Low	Mod	Mod	NOQ3	High
Clark	Missouri	29045	Low	Low	Low	Low	NOQ3	High
Clay	Missouri	29047	Low	Mod	Mod	Mod	Q3	Mod
Clinton	Missouri	29049	Low	Mod	Mod	Mod	NOQ3	Mod
Cole	Missouri	29051	Low	Mod	Low	Low	Q3	High
Cooper	Missouri	29053	Low	Mod	Low	Low	NOQ3	High
Crawford	Missouri	29055	Mod	Low	Low	Low	NOQ3	High
Dade	Missouri	29057	Low	Low	Low	Low	NOQ3	High
Dallas	Missouri	29059	Low	Low	Low	Low	NOQ3	High
Daviess	Missouri	29061	Low	Mod	Low	Low	NOQ3	Mod
De Kalb	Missouri	29063	Low	Mod	Mod	Mod	NOQ3	Mod
Dent	Missouri	29065	Mod	Low	Low	Low	NOQ3	High
Douglas	Missouri	29067	Mod	Low	Low	Low	NOQ3	High
Dunklin	Missouri	29069	High	Low	Mod	Mod	NOQ3	High
Franklin	Missouri	29071	Mod	Mod	Low	Low	Q3	High
Gasconade	Missouri	29073	Mod	Low	Low	Low	NOQ3	High
Gentry	Missouri	29075	Low	Mod	Low	Low	NOQ3	Mod
Greene	Missouri	29077	Low	Low	Mod	Mod	Q3	High
Grundy	Missouri	29079	Low	Mod	Low	Low	NOQ3	Mod
Harrison	Missouri	29081	Low	Mod	Low	Low	NOQ3	Mod
Henry	Missouri	29083	Low	Low	Low	Low	NOQ3	High
Hickory	Missouri	29085	Low	Low	Low	Low	NOQ3	High
Holt	Missouri	29087	Low	Mod	Low	Low	NOQ3	Mod
Howard	Missouri	29089	Low	Mod	Low	Low	NOQ3	High
Howell	Missouri	29091	Mod	Low	Mod	Mod	NOQ3	High
Iron	Missouri	29093	Mod	Low	Low	Low	NOQ3	High
Jackson	Missouri	29095	Low	Mod	Mod	Mod	Q3	High
Jasper	Missouri	29097	Low	Low	Mod	Mod	NOQ3	High
Jefferson	Missouri	29099	Mod	Mod	Mod	Mod	Q3	High
Johnson	Missouri	29101	Low	Low	Low	Low	NOQ3	High
Knox	Missouri	29103	Low	Mod	Low	Low	NOQ3	High

County	State	FIPS	EQ	LS	Wind	Torn	Flood	Icing
Laclede	Missouri	29105	Mod	Low	Low	Low	NOQ3	High
Lafayette	Missouri	29107	Low	Mod	Low	Low	NOQ3	High
Lawrence	Missouri	29109	Low	Low	Low	Low	NOQ3	High
Lewis	Missouri	29111	Low	Mod	Low	Low	NOQ3	High
Lincoln	Missouri	29113	Mod	High	Low	Low	NOQ3	High
Linn	Missouri	29115	Low	Mod	Low	Low	NOQ3	High
Livingston	Missouri	29117	Low	Low	Low	Low	NOQ3	High
Macon	Missouri	29121	Low	Mod	Low	Low	NOQ3	High
Madison	Missouri	29123	Mod	Low	Low	Low	NOQ3	High
Maries	Missouri	29125	Mod	Low	Low	Low	NOQ3	High
Marion	Missouri	29127	Low	Mod	Low	Low	NOQ3	High
McDonald	Missouri	29119	Low	Low	Low	Low	NOQ3	High
Mercer	Missouri	29129	Low	Mod	Low	Low	NOQ3	Mod
Miller	Missouri	29131	Mod	Low	Mod	Mod	NOQ3	High
Mississippi	Missouri	29133	High	High	Mod	Mod	NOQ3	High
Moniteau	Missouri	29135	Low	Mod	Mod	Mod	NOQ3	High
Monroe	Missouri	29137	Low	Mod	Low	Low	NOQ3	High
Montgomery	Missouri	29139	Mod	Low	Low	Low	NOQ3	High
Morgan	Missouri	29141	Low	Low	Mod	Mod	NOQ3	High
New Madrid	Missouri	29143	High	High	Low	Low	NOQ3	High
Newton	Missouri	29145	Low	Low	Mod	Mod	NOQ3	High
Nodaway	Missouri	29147	Low	Mod	Mod	Mod	NOQ3	Mod
Oregon	Missouri	29149	Mod	Low	Low	Low	NOQ3	High
Osage	Missouri	29151	Mod	Low	Low	Low	NOQ3	High
Ozark	Missouri	29153	Mod	Low	Mod	Mod	NOQ3	High
Pemiscot	Missouri	29155	High	High	Mod	Mod	NOQ3	High
Perry	Missouri	29157	High	Low	Mod	Mod	NOQ3	High
Pettis	Missouri	29159	Low	Low	Mod	Mod	NOQ3	High
Phelps	Missouri	29161	Mod	Low	Low	Low	NOQ3	High
Pike	Missouri	29163	Mod	High	Low	Low	NOQ3	High
Platte	Missouri	29165	Low	Mod	Mod	Mod	Q3	Mod
Polk	Missouri	29167	Low	Low	Low	Low	NOQ3	High
Pulaski	Missouri	29169	Mod	Low	Low	Low	NOQ3	High
Putnam	Missouri	29171	Low	Mod	Low	Low	NOQ3	Mod
Ralls	Missouri	29173	Low	High	Low	Low	NOQ3	High
Randolph	Missouri	29175	Low	Mod	Low	Low	NOQ3	High
Ray	Missouri	29177	Low	Mod	Mod	Mod	NOQ3	High
Reynolds	Missouri	29179	Mod	Low	Low	Low	NOQ3	High
Ripley	Missouri	29181	Mod	Low	Low	Low	NOQ3	High
Saline	Missouri	29195	Low	Mod	Low	Low	NOQ3	High
Schuyler	Missouri	29197	Low	Mod	Low	Low	NOQ3	Mod
Scotland	Missouri	29199	Low	Mod	Low	Low	NOQ3	Mod
Scott	Missouri	29201	High	High	Mod	Mod	NOQ3	High
Shannon	Missouri	29203	Mod	Low	Low	Low	NOQ3	High
Shelby	Missouri	29205	Low	Mod	Low	Low	NOQ3	High
St. Charles	Missouri	29183	Mod	High	Mod	Mod	Q3	High
St. Clair	Missouri	29185	Low	Low	Low	Low	NOQ3	High

County	State	FIPS	EQ	LS	Wind	Torn	Flood	Icing
St. Francois	Missouri	29187	Mod	Low	Mod	Mod	NOQ3	High
St. Louis	Missouri	29510	Mod	Mod	Mod	Mod	Q3	High
St. Louis City	Missouri	29189	Mod	Mod	Mod	Mod	Q3	High
Ste. Genevieve	Missouri	29186	Mod	Low	Low	Low	NOQ3	High
Stoddard	Missouri	29207	High	Low	Low	Low	NOQ3	High
Stone	Missouri	29209	Low	Low	Low	Low	NOQ3	High
Sullivan	Missouri	29211	Low	Mod	Low	Low	NOQ3	Mod
Taney	Missouri	29213	Mod	Low	Low	Low	NOQ3	High
Texas	Missouri	29215	Mod	Low	Low	Low	NOQ3	High
Vernon	Missouri	29217	Low	Low	Low	Low	NOQ3	High
Warren	Missouri	29219	Mod	Mod	Low	Low	NOQ3	High
Washington	Missouri	29221	Mod	Low	Low	Low	NOQ3	High
Wayne	Missouri	29223	High	Low	Low	Low	NOQ3	High
Webster	Missouri	29225	Mod	Low	Low	Low	NOQ3	High
Worth	Missouri	29227	Low	Low	Mod	Mod	NOQ3	Mod
Wright	Missouri	29229	Mod	Low	Low	Low	NOQ3	High
Beaverhead	Montana	30001	High	High	Low	Low	NOQ3	Low
Big Horn	Montana	30003	Mod	High	Low	Low	NOQ3	Low
Blaine	Montana	30005	Low	High	Low	Low	NOQ3	Low
Broadwater	Montana	30007	Mod	High	Low	Low	Q3	Low
Carbon	Montana	30009	Mod	High	Low	Low	Q3	Low
Carter	Montana	30011	Low	High	Low	Low	NOQ3	Low
Cascade	Montana	30013	Mod	High	Low	Low	Q3	Low
Chouteau	Montana	30015	Mod	High	Low	Low	NOQ3	Low
Custer	Montana	30017	Low	Low	Low	Low	Q3	Low
Daniels	Montana	30019	Mod	Low	Low	Low	NOQ3	Low
Dawson	Montana	30021	Low	High	Low	Low	Q3	Low
Deer Lodge	Montana	30023	Mod	Mod	Low	Low	Q3	Low
Fallon	Montana	30025	Low	High	Low	Low	NOQ3	Low
Fergus	Montana	30027	Low	High	Low	Low	NOQ3	Low
Flathead	Montana	30029	Mod	High	Low	Low	Q3	Low
Gallatin	Montana	30031	High	High	Low	Low	NOQ3	Low
Garfield	Montana	30033	Mod	High	Low	Low	NOQ3	Low
Glacier	Montana	30035	Mod	High	Low	Low	NOQ3	Low
Golden Valley	Montana	30037	Low	High	Low	Low	NOQ3	Low
Granite	Montana	30039	Mod	Mod	Low	Low	NOQ3	Low
Hill	Montana	30041	Low	High	Low	Low	NOQ3	Low
Jefferson	Montana	30043	Mod	High	Low	Low	NOQ3	Low
Judith Basin	Montana	30045	Mod	High	Low	Low	NOQ3	Low
Lake	Montana	30047	High	Low	Low	Low	NOQ3	Low
Lewis and Clark	Montana	30049	Mod	High	Low	Low	NOQ3	Low
Liberty	Montana	30051	Mod	High	Low	Low	NOQ3	Low
Lincoln	Montana	30053	Mod	Low	Low	Low	Q3	Low
Madison	Montana	30057	High	High	Low	Low	NOQ3	Low
McCone	Montana	30055	Mod	High	Low	Low	NOQ3	Low
Meagher	Montana	30059	Mod	High	Low	Low	Q3	Low
Mineral	Montana	30061	Mod	Mod	Low	Low	NOQ3	Low

County	State	FIPS	EQ	LS	Wind	Torn	Flood	Icing
Missoula	Montana	30063	Mod	Mod	Low	Low	NOQ3	Low
Musselshell	Montana	30065	Low	High	Low	Low	Q3	Low
Park	Montana	30067	Mod	High	Low	Low	Q3	Low
Petroleum	Montana	30069	Low	High	Low	Low	NOQ3	Low
Phillips	Montana	30071	Low	High	Low	Low	NOQ3	Low
Pondera	Montana	30073	Mod	High	Low	Low	NOQ3	Low
Powder River	Montana	30075	Mod	High	Low	Low	NOQ3	Low
Powell	Montana	30077	Mod	High	Low	Low	NOQ3	Low
Prairie	Montana	30079	Low	High	Low	Low	NOQ3	Low
Ravalli	Montana	30081	Mod	Mod	Low	Low	Q3	Low
Richland	Montana	30083	Low	High	Low	Low	Q3	Mod
Roosevelt	Montana	30085	Mod	High	Low	Low	NOQ3	Mod
Rosebud	Montana	30087	Mod	High	Low	Low	NOQ3	Low
Sanders	Montana	30089	Mod	Mod	Low	Low	Q3	Low
Sheridan	Montana	30091	Mod	Low	Low	Low	NOQ3	Mod
Silver Bow	Montana	30093	Mod	Mod	Low	Low	NOQ3	Low
Stillwater	Montana	30095	Mod	High	Low	Low	NOQ3	Low
Sweet Grass	Montana	30097	Mod	High	Low	Low	Q3	Low
Teton	Montana	30099	Mod	High	Low	Low	NOQ3	Low
Toole	Montana	30101	Mod	High	Low	Low	NOQ3	Low
Treasure	Montana	30103	Low	High	Low	Low	Q3	Low
Valley	Montana	30105	Mod	High	Low	Low	NOQ3	Low
Wheatland	Montana	30107	Mod	High	Low	Low	Q3	Low
Wibaux	Montana	30109	Low	High	Low	Low	NOQ3	Mod
Yellowstone	Montana	30111	Low	High	Low	Low	Q3	Low
Yellowstone National Park	Montana	30113	High	High	Low	Low	NOQ3	Low
Adams	Nebraska	31001	Low	Low	Mod	Mod	NOQ3	Mod
Antelope	Nebraska	31003	Low	Low	Mod	Mod	NOQ3	Mod
Arthur	Nebraska	31005	Low	Low	Low	Low	NOQ3	Mod
Banner	Nebraska	31007	Low	Low	Low	Low	NOQ3	Low
Blaine	Nebraska	31009	Low	Low	Low	Low	NOQ3	Mod
Boone	Nebraska	31011	Low	Low	Mod	Mod	NOQ3	Mod
Box Butte	Nebraska	31013	Low	Low	Mod	Mod	NOQ3	Low
Boyd	Nebraska	31015	Low	High	Low	Low	NOQ3	Mod
Brown	Nebraska	31017	Low	High	Low	Low	NOQ3	Mod
Buffalo	Nebraska	31019	Low	Low	Mod	Mod	NOQ3	Mod
Burt	Nebraska	31021	Low	Low	Mod	Mod	NOQ3	Mod
Butler	Nebraska	31023	Low	Low	Mod	Mod	NOQ3	Mod
Cass	Nebraska	31025	Low	Mod	Mod	Mod	Q3	Mod
Cedar	Nebraska	31027	Low	High	Low	Low	NOQ3	Mod
Chase	Nebraska	31029	Low	Low	Low	Low	NOQ3	Mod
Cherry	Nebraska	31031	Low	Low	Low	Low	NOQ3	Mod
Cheyenne	Nebraska	31033	Low	Low	Mod	Mod	NOQ3	Low
Clay	Nebraska	31035	Low	Low	Mod	Mod	NOQ3	Mod
Colfax	Nebraska	31037	Low	Low	Mod	Mod	NOQ3	Mod
Cuming	Nebraska	31039	Low	Low	Mod	Mod	NOQ3	Mod
Custer	Nebraska	31041	Low	Low	Low	Low	NOQ3	Mod

County	State	FIPS	EQ	LS	Wind	Torn	Flood	Icing
Dakota	Nebraska	31043	Low	Low	Low	Low	NOQ3	Mod
Dawes	Nebraska	31045	Low	High	Low	Low	NOQ3	Low
Dawson	Nebraska	31047	Low	Low	Mod	Mod	NOQ3	Mod
Deuel	Nebraska	31049	Low	Low	Mod	Mod	NOQ3	Mod
Dixon	Nebraska	31051	Low	Low	Mod	Mod	NOQ3	Mod
Dodge	Nebraska	31053	Low	Low	Mod	Mod	Q3	Mod
Douglas	Nebraska	31055	Low	Low	Mod	Mod	Q3	Mod
Dundy	Nebraska	31057	Low	Mod	Low	Low	NOQ3	Mod
Fillmore	Nebraska	31059	Low	Low	Mod	Mod	NOQ3	Mod
Franklin	Nebraska	31061	Low	Low	Mod	Mod	NOQ3	Mod
Frontier	Nebraska	31063	Low	Low	Low	Low	NOQ3	Mod
Furnas	Nebraska	31065	Low	Low	Mod	Mod	NOQ3	Mod
Gage	Nebraska	31067	Low	Mod	Mod	Mod	NOQ3	Mod
Garden	Nebraska	31069	Low	Low	Low	Low	NOQ3	Mod
Garfield	Nebraska	31071	Low	Low	Low	Low	NOQ3	Mod
Gosper	Nebraska	31073	Low	Low	Mod	Mod	NOQ3	Mod
Grant	Nebraska	31075	Low	Low	Low	Low	NOQ3	Mod
Greeley	Nebraska	31077	Low	Low	Mod	Mod	NOQ3	Mod
Hall	Nebraska	31079	Low	Low	High	High	h Q3	Mod
Hamilton	Nebraska	31081	Low	Low	Mod	Mod	NOQ3	Mod
Harlan	Nebraska	31083	Low	Low	Low	Low	NOQ3	Mod
Hayes	Nebraska	31085	Low	Low	Low	Low	NOQ3	Mod
Hitchcock	Nebraska	31087	Low	Low	Mod	Mod	NOQ3	Mod
Holt	Nebraska	31089	Low	High	Low	Low	NOQ3	Mod
Hooker	Nebraska	31091	Low	Low	Low	Low	NOQ3	Mod
Howard	Nebraska	31093	Low	Low	Mod	Mod	NOQ3	Mod
Jefferson	Nebraska	31095	Low	Mod	Mod	Mod	NOQ3	Mod
Johnson	Nebraska	31097	Low	Low	Mod	Mod	NOQ3	Mod
Kearney	Nebraska	31099	Low	Low	Mod	Mod	NOQ3	Mod
Keith	Nebraska	31101	Low	Low	Mod	Mod	NOQ3	Mod
Keya Paha	Nebraska	31103	Low	High	Low	Low	NOQ3	Mod
Kimball	Nebraska	31105	Low	Low	Mod	Mod	NOQ3	Low
Knox	Nebraska	31107	Low	High	Mod	Mod	NOQ3	Mod
Lancaster	Nebraska	31109	Low	Low	Mod	Mod	Q3	Mod
Lincoln	Nebraska	31111	Low	Low	Low	Low	NOQ3	Mod
Logan	Nebraska	31113	Low	Low	Low	Low	NOQ3	Mod
Loup	Nebraska	31115	Low	Low	Low	Low	NOQ3	Mod
Madison	Nebraska	31119	Low	Low	Mod	Mod	NOQ3	Mod
McPherson	Nebraska	31117	Low	Low	Low	Low	NOQ3	Mod
Merrick	Nebraska	31121	Low	Low	Mod	Mod	NOQ3	Mod
Morrill	Nebraska	31123	Low	Low	Mod	Mod	NOQ3	Low
Nance	Nebraska	31125	Low	Low	Mod	Mod	NOQ3	Mod
Nemaha	Nebraska	31127	Low	Mod	Mod	Mod	NOQ3	Mod
Nuckolls	Nebraska	31129	Low	Low	Mod	Mod	NOQ3	Mod
Otoe	Nebraska	31131	Low	Mod	Mod	Mod	NOQ3	Mod
Pawnee	Nebraska	31133	Low	Low	Mod	Mod	NOQ3	Mod
Perkins	Nebraska	31135	Low	Low	Mod	Mod	NOQ3	Mod

County	State	FIPS	EQ	LS	Wind	Torn	Flood	Icing
Phelps	Nebraska	31137	Low	Low	Mod	Mod	NOQ3	Mod
Pierce	Nebraska	31139	Low	High	Mod	Mod	NOQ3	Mod
Platte	Nebraska	31141	Low	Low	Mod	Mod	Q3	Mod
Polk	Nebraska	31143	Low	Low	Mod	Mod	NOQ3	Mod
Red Willow	Nebraska	31145	Low	Low	Mod	Mod	NOQ3	Mod
Richardson	Nebraska	31147	Low	Mod	Low	Low	NOQ3	Mod
Rock	Nebraska	31149	Low	High	Low	Low	NOQ3	Mod
Saline	Nebraska	31151	Low	Low	Mod	Mod	NOQ3	Mod
Sarpy	Nebraska	31153	Low	Low	Mod	Mod	Q3	Mod
Saunders	Nebraska	31155	Low	Low	Mod	Mod	Q3	Mod
Scotts Bluff	Nebraska	31157	Low	Low	Mod	Mod	NOQ3	Low
Seward	Nebraska	31159	Low	Low	Mod	Mod	NOQ3	Mod
Sheridan	Nebraska	31161	Low	High	Low	Low	NOQ3	Mod
Sherman	Nebraska	31163	Low	Low	Mod	Mod	NOQ3	Mod
Sioux	Nebraska	31165	Low	High	Low	Low	NOQ3	Low
Stanton	Nebraska	31167	Low	Low	Mod	Mod	NOQ3	Mod
Thayer	Nebraska	31169	Low	Mod	Mod	Mod	NOQ3	Mod
Thomas	Nebraska	31171	Low	Low	Low	Low	NOQ3	Mod
Thurston	Nebraska	31173	Low	Low	Mod	Mod	NOQ3	Mod
Valley	Nebraska	31175	Low	Low	Mod	Mod	NOQ3	Mod
Washington	Nebraska	31177	Low	Low	Mod	Mod	NOQ3	Mod
Wayne	Nebraska	31179	Low	Low	Mod	Mod	NOQ3	Mod
Webster	Nebraska	31181	Low	Low	Mod	Mod	NOQ3	Mod
Wheeler	Nebraska	31183	Low	Low	Low	Low	NOQ3	Mod
York	Nebraska	31185	Low	Low	Mod	Mod	NOQ3	Mod
Carson City	Nevada	32510	High	High	Low	Low	Q3	Low
Churchill	Nevada	32001	Mod	High	Low	Low	NOQ3	Low
Clark	Nevada	32003	Mod	Mod	Low	Low	Q3	Low
Douglas	Nevada	32005	High	Mod	Low	Low	NOQ3	Low
Elko	Nevada	32007	Mod	High	Low	Low	NOQ3	Low
Esmeralda	Nevada	32009	High	High	Low	Low	NOQ3	Low
Eureka	Nevada	32011	Mod	High	Low	Low	NOQ3	Low
Humboldt	Nevada	32013	Mod	High	Low	Low	NOQ3	Low
Lander	Nevada	32015	Mod	High	Low	Low	NOQ3	Low
Lincoln	Nevada	32017	Mod	Mod	Low	Low	NOQ3	Low
Lyon	Nevada	32019	High	Mod	Low	Low	NOQ3	Low
Mineral	Nevada	32021	High	High	Low	Low	NOQ3	Low
Nye	Nevada	32023	High	High	Low	Low	NOQ3	Low
Pershing	Nevada	32027	Mod	High	Low	Low	NOQ3	Low
Storey	Nevada	32029	High	Mod	Low	Low	NOQ3	Low
Washoe	Nevada	32031	High	High	Low	Low	Q3	Low
White Pine	Nevada	32033	Mod	High	Low	Low	NOQ3	Low
Belknap	New Hampshire	33001	Mod	High	Mod	Low	NOQ3	High
Carroll	New Hampshire	33003	Mod	High	Mod	Low	NOQ3	High
Cheshire	New Hampshire	33005	Mod	High	Mod	Low	Q3	High
Coos	New Hampshire	33007	Mod	High	Low	Low	NOQ3	Mod
Grafton	New Hampshire	33009	Mod	High	Low	Low	NOQ3	Mod

County	State	FIPS	EQ	LS	Wind	Torn	Flood	Icing
Hillsborough	New Hampshire	33011	Mod	Low	Mod	Low	Q3	High
Merrimack	New Hampshire	33013	Mod	Mod	Mod	Low	NOQ3	High
Rockingham	New Hampshire	33015	Mod	High	Mod	Low	Q3	High
Strafford	New Hampshire	33017	Mod	High	Mod	Low	NOQ3	High
Sullivan	New Hampshire	33019	Mod	High	Low	Low	NOQ3	High
Atlantic	New Jersey	34001	Mod	Low	High	Low	Q3	Mod
Bergen	New Jersey	34003	Mod	High	Mod	Mod	Q3	Mod
Burlington	New Jersey	34005	Mod	Mod	High	Low	Q3	Mod
Camden	New Jersey	34007	Mod	Mod	Mod	Low	Q3	Mod
Cape May	New Jersey	34009	Low	Low	High	Mod	Q3	Mod
Cumberland	New Jersey	34011	Mod	Low	High	Low	Q3	Mod
Essex	New Jersey	34013	Mod	High	Mod	Low	Q3	Mod
Gloucester	New Jersey	34015	Mod	Mod	Mod	Mod	Q3	Mod
Hudson	New Jersey	34017	Mod	Low	Mod	Low	Q3	Mod
Hunterdon	New Jersey	34019	Mod	Low	Low	Low	Q3	High
Mercer	New Jersey	34021	Mod	Mod	Mod	Mod	Q3	High
Middlesex	New Jersey	34023	Mod	High	Mod	Low	Q3	High
Monmouth	New Jersey	34025	Mod	High	High	Low	Q3	Mod
Morris	New Jersey	34027	Mod	High	Mod	Low	Q3	High
Ocean	New Jersey	34029	Mod	Low	High	Low	Q3	Mod
Passaic	New Jersey	34031	Mod	High	Mod	Low	Q3	Mod
Salem	New Jersey	34033	Mod	Mod	Mod	Low	Q3	Mod
Somerset	New Jersey	34035	Mod	High	Mod	Low	Q3	High
Sussex	New Jersey	34037	Mod	High	Low	Low	Q3	Mod
Union	New Jersey	34039	Mod	High	Mod	Mod	Q3	High
Warren	New Jersey	34041	Mod	Low	Low	Low	Q3	High
Bernalillo	New Mexico	35001	Mod	High	Low	Low	NOQ3	Low
Catron	New Mexico	35003	Mod	High	Low	Low	NOQ3	Low
Chaves	New Mexico	35005	Mod	Mod	Low	Low	NOQ3	Low
Cibola	New Mexico	35006	Mod	High	Low	Low	NOQ3	Low
Colfax	New Mexico	35007	Mod	High	Low	Low	NOQ3	Low
Curry	New Mexico	35009	Low	Mod	Mod	Mod	Q3	Low
De Baca	New Mexico	35011	Low	Mod	Low	Low	NOQ3	Low
Dona Ana	New Mexico	35013	Mod	Mod	Low	Low	Q3	Low
Eddy	New Mexico	35015	Mod	Low	Low	Low	NOQ3	Low
Grant	New Mexico	35017	Mod	High	Low	Low	NOQ3	Low
Guadalupe	New Mexico	35019	Mod	Mod	Low	Low	NOQ3	Low
Harding	New Mexico	35021	Low	Mod	Low	Low	NOQ3	Low
Hidalgo	New Mexico	35023	Mod	Low	Low	Low	NOQ3	Low
Lea	New Mexico	35025	Mod	Low	Low	Low	NOQ3	Low
Lincoln	New Mexico	35027	Mod	High	Low	Low	NOQ3	Low
Los Alamos	New Mexico	35028	Mod	High	Low	Low	NOQ3	Low
Luna	New Mexico	35029	Mod	Low	Low	Low	NOQ3	Low
McKinley	New Mexico	35031	Mod	High	Low	Low	NOQ3	Low
Mora	New Mexico	35033	Mod	High	Low	Low	NOQ3	Low
Otero	New Mexico	35035	Mod	High	Low	Low	Q3	Low
Quay	New Mexico	35037	Low	Mod	Low	Low	NOQ3	Low

County	State	FIPS	EQ	LS	Wind	Torn	Flood	Icing
Rio Arriba	New Mexico	35039	Mod	High	Low	Low	NOQ3	Low
Roosevelt	New Mexico	35041	Low	Mod	Low	Low	NOQ3	Low
San Juan	New Mexico	35045	Mod	High	Low	Low	NOQ3	Low
San Miguel	New Mexico	35047	Mod	High	Low	Low	NOQ3	Low
Sandoval	New Mexico	35043	Mod	High	Low	Low	NOQ3	Low
Santa Fe	New Mexico	35049	Mod	High	Low	Low	NOQ3	Low
Sierra	New Mexico	35051	Mod	High	Low	Low	NOQ3	Low
Socorro	New Mexico	35053	Mod	High	Low	Low	NOQ3	Low
Taos	New Mexico	35055	Mod	High	Low	Low	NOQ3	Low
Torrance	New Mexico	35057	Mod	Mod	Low	Low	NOQ3	Low
Union	New Mexico	35059	Low	High	Low	Low	NOQ3	Low
Valencia	New Mexico	35061	Mod	High	Low	Low	NOQ3	Low
Albany	New York	36001	Mod	High	Low	Low	Q3	Mod
Allegany	New York	36003	Mod	Mod	Low	Low	Q3	Mod
Bronx	New York	36005	Mod	Low	Mod	Low	Q3	Mod
Broome	New York	36007	Low	Mod	Low	Low	Q3	Mod
Cattaraugus	New York	36009	Mod	Mod	Low	Low	Q3	Mod
Cayuga	New York	36011	Low	Mod	Low	Low	Q3	High
Chautauqua	New York	36013	Mod	Mod	Low	Low	Q3	Mod
Chemung	New York	36015	Low	Low	Low	Low	Q3	Mod
Chenango	New York	36017	Low	Mod	Low	Low	Q3	Mod
Clinton	New York	36019	Mod	High	Low	Low	NOQ3	High
Columbia	New York	36021	Mod	High	Low	Low	Q3	Mod
Cortland	New York	36023	Low	Mod	Low	Low	Q3	Mod
Delaware	New York	36025	Mod	High	Low	Low	Q3	Mod
Dutchess	New York	36027	Mod	High	Mod	Low	Q3	Mod
Erie	New York	36029	Mod	Mod	Low	Low	Q3	High
Essex	New York	36031	Mod	High	Low	Low	NOQ3	Mod
Franklin	New York	36033	Mod	High	Low	Low	NOQ3	High
Fulton	New York	36035	Mod	Low	Low	Low	Q3	Mod
Genesee	New York	36037	Mod	Mod	Low	Low	Q3	High
Greene	New York	36039	Mod	High	Low	Low	NOQ3	Mod
Hamilton	New York	36041	Mod	High	Low	Low	NOQ3	Mod
Herkimer	New York	36043	Mod	Low	Low	Low	Q3	High
Jefferson	New York	36045	Mod	Mod	Low	Low	Q3	High
Kings	New York	36047	Mod	Low	High	Low	Q3	Mod
Lewis	New York	36049	Mod	Low	Low	Low	NOQ3	High
Livingston	New York	36051	Mod	Mod	Low	Low	Q3	High
Madison	New York	36053	Low	Mod	Low	Low	Q3	High
Monroe	New York	36055	Mod	Mod	Low	Low	Q3	High
Montgomery	New York	36057	Mod	Low	Low	Low	NOQ3	Mod
Nassau	New York	36059	Mod	High	High	Low	Q3	Mod
New York	New York	36061	Mod	Low	Mod	Low	Q3	Mod
Niagara	New York	36063	Mod	High	Low	Low	Q3	High
Oneida	New York	36065	Mod	Mod	Low	Low	Q3	High
Onondaga	New York	36067	Low	Mod	Low	Low	Q3	High
Ontario	New York	36069	Mod	Mod	Low	Low	Q3	High

County	State	FIPS	EQ	LS	Wind	Torn	Flood	Icing
Orange	New York	36071	Mod	High	Low	Low	Q3	Mod
Orleans	New York	36073	Mod	Mod	Low	Low	NOQ3	High
Oswego	New York	36075	Mod	Mod	Low	Low	Q3	High
Otsego	New York	36077	Mod	Low	Low	Low	NOQ3	Mod
Putnam	New York	36079	Mod	High	Mod	Low	NOQ3	Mod
Queens	New York	36081	Mod	Low	High	Low	Q3	Mod
Rensselaer	New York	36083	Mod	High	Low	Low	Q3	Mod
Richmond	New York	36085	Mod	Low	Mod	Mod	Q3	Mod
Rockland	New York	36087	Mod	High	Mod	Low	Q3	Mod
Saratoga	New York	36091	Mod	High	Low	Low	Q3	Mod
Schenectady	New York	36093	Mod	High	Low	Low	NOQ3	Mod
Schoharie	New York	36095	Mod	Low	Low	Low	NOQ3	Mod
Schuyler	New York	36097	Low	Mod	Low	Low	NOQ3	Mod
Seneca	New York	36099	Low	Mod	Low	Low	Q3	High
St. Lawrence	New York	36089	Mod	High	Low	Low	NOQ3	High
Steuben	New York	36101	Mod	Mod	Low	Low	Q3	Mod
Suffolk	New York	36103	Mod	High	High	Low	Q3	Mod
Sullivan	New York	36105	Mod	High	Low	Low	Q3	Mod
Tioga	New York	36107	Low	Mod	Low	Low	Q3	Mod
Tompkins	New York	36109	Low	Mod	Low	Low	Q3	Mod
Ulster	New York	36111	Mod	High	Low	Low	Q3	Mod
Warren	New York	36113	Mod	High	Low	Low	NOQ3	Mod
Washington	New York	36115	Mod	High	Low	Low	NOQ3	Mod
Wayne	New York	36117	Mod	Mod	Low	Low	Q3	High
Westchester	New York	36119	Mod	High	Mod	Low	Q3	Mod
Wyoming	New York	36121	Mod	Low	Low	Low	NOQ3	High
Yates	New York	36123	Mod	Mod	Low	Low	Q3	High
Alamance	North Carolina	37001	Low	Mod	Low	Low	Q3	Mod
Alexander	North Carolina	37003	Mod	High	Low	Low	NOQ3	Mod
Alleghany	North Carolina	37005	Mod	High	Low	Low	NOQ3	Mod
Anson	North Carolina	37007	Mod	High	Mod	Low	NOQ3	Mod
Ashe	North Carolina	37009	Mod	High	Low	Low	NOQ3	Mod
Avery	North Carolina	37011	Mod	High	Low	Low	NOQ3	Mod
Beaufort	North Carolina	37013	Low	Low	High	Low	Q3	Mod
Bertie	North Carolina	37015	Low	Low	Mod	Low	Q3	Mod
Bladen	North Carolina	37017	Mod	Low	High	Low	Q3	Mod
Brunswick	North Carolina	37019	Mod	Low	High	Low	Q3	Low
Buncombe	North Carolina	37021	Mod	High	Low	Low	Q3	Mod
Burke	North Carolina	37023	Mod	High	Low	Low	NOQ3	Mod
Cabarrus	North Carolina	37025	Mod	High	Mod	Mod	Q3	Mod
Caldwell	North Carolina	37027	Mod	High	Low	Low	NOQ3	Mod
Camden	North Carolina	37029	Low	Low	High	Low	Q3	Mod
Carteret	North Carolina	37031	Low	Low	High	Mod	Q3	Low
Caswell	North Carolina	37033	Low	Mod	Low	Low	NOQ3	Mod
Catawba	North Carolina	37035	Mod	High	Mod	Mod	NOQ3	Mod
Chatham	North Carolina	37037	Mod	Mod	Mod	Low	NOQ3	Mod
Cherokee	North Carolina	37039	Mod	High	Low	Low	NOQ3	Mod

County	State	FIPS	EQ	LS	Wind	Torn	Flood	Icing
Chowan	North Carolina	37041	Low	Low	Mod	Mod	NOQ3	Mod
Clay	North Carolina	37043	Mod	High	Low	Low	NOQ3	Mod
Cleveland	North Carolina	37045	Mod	High	Low	Low	NOQ3	Mod
Columbus	North Carolina	37047	Mod	Low	High	Low	Q3	Mod
Craven	North Carolina	37049	Low	Low	High	Low	Q3	Mod
Cumberland	North Carolina	37051	Mod	Low	Mod	Mod	Q3	Mod
Currituck	North Carolina	37053	Low	Low	High	Low	Q3	Mod
Dare	North Carolina	37055	Low	Low	High	Mod	Q3	Low
Davidson	North Carolina	37057	Mod	Mod	Low	Low	Q3	Mod
Davie	North Carolina	37059	Mod	Mod	Low	Low	NOQ3	Mod
Duplin	North Carolina	37061	Mod	Low	High	Low	Q3	Mod
Durham	North Carolina	37063	Low	Mod	Mod	Low	Q3	Mod
Edgecombe	North Carolina	37065	Low	Low	Mod	Low	Q3	Mod
Forsyth	North Carolina	37067	Mod	Mod	Mod	Mod	Q3	Mod
Franklin	North Carolina	37069	Low	Low	Mod	Low	Q3	Mod
Gaston	North Carolina	37071	Mod	High	Low	Low	NOQ3	Mod
Gates	North Carolina	37073	Low	Low	Mod	Low	NOQ3	Mod
Graham	North Carolina	37075	Mod	High	Low	Low	NOQ3	Mod
Granville	North Carolina	37077	Low	Mod	Mod	Low	Q3	Mod
Greene	North Carolina	37079	Low	Low	Mod	Mod	Q3	Mod
Guilford	North Carolina	37081	Mod	Mod	Low	Low	Q3	Mod
Halifax	North Carolina	37083	Low	Low	Mod	Low	Q3	Mod
Harnett	North Carolina	37085	Mod	Low	Mod	Mod	Q3	Mod
Haywood	North Carolina	37087	Mod	High	Low	Low	NOQ3	Mod
Henderson	North Carolina	37089	Mod	High	Low	Low	Q3	Mod
Hertford	North Carolina	37091	Low	Low	Mod	Low	NOQ3	Mod
Hoke	North Carolina	37093	Mod	Low	Mod	Low	Q3	Mod
Hyde	North Carolina	37095	Low	Low	High	Low	Q3	Mod
Iredell	North Carolina	37097	Mod	High	Low	Low	NOQ3	Mod
Jackson	North Carolina	37099	Mod	High	Low	Low	NOQ3	Mod
Johnston	North Carolina	37101	Mod	Low	Mod	Low	Q3	Mod
Jones	North Carolina	37103	Low	Low	High	Low	Q3	Mod
Lee	North Carolina	37105	Mod	Mod	Mod	Low	NOQ3	Mod
Lenoir	North Carolina	37107	Low	Low	High	Mod	Q3	Mod
Lincoln	North Carolina	37109	Mod	High	Low	Low	NOQ3	Mod
Macon	North Carolina	37113	Mod	High	Low	Low	NOQ3	Mod
Madison	North Carolina	37115	Mod	High	Low	Low	NOQ3	Mod
Martin	North Carolina	37117	Low	Low	Mod	Low	NOQ3	Mod
McDowell	North Carolina	37111	Mod	High	Low	Low	NOQ3	Mod
Mecklenburg	North Carolina	37119	Mod	High	Mod	Mod	Q3	Mod
Mitchell	North Carolina	37121	Mod	High	Low	Low	NOQ3	Mod
Montgomery	North Carolina	37123	Mod	High	Mod	Low	NOQ3	Mod
Moore	North Carolina	37125	Mod	Mod	Mod	Low	Q3	Mod
Nash	North Carolina	37127	Low	Low	Mod	Low	Q3	Mod
New Hanover	North Carolina	37129	Mod	Low	High	Mod	Q3	Low
Northampton	North Carolina	37131	Low	Low	Mod	Low	NOQ3	Mod
Onslow	North Carolina	37133	Mod	Low	High	Mod	Q3	Mod

County	State	FIPS	EQ	LS	Wind	Torn	Flood	Icing
Orange	North Carolina	37135	Low	Mod	Low	Low	Q3	Mod
Pamlico	North Carolina	37137	Low	Low	High	Low	Q3	Low
Pasquotank	North Carolina	37139	Low	Low	High	Mod	Q3	Mod
Pender	North Carolina	37141	Mod	Low	High	Low	Q3	Mod
Perquimans	North Carolina	37143	Low	Low	Mod	Low	NOQ3	Mod
Person	North Carolina	37145	Low	Mod	Low	Low	Q3	Mod
Pitt	North Carolina	37147	Low	Low	Mod	Low	Q3	Mod
Polk	North Carolina	37149	Mod	High	Low	Low	NOQ3	Mod
Randolph	North Carolina	37151	Mod	Mod	Mod	Low	Q3	Mod
Richmond	North Carolina	37153	Mod	Mod	Mod	Low	NOQ3	Mod
Robeson	North Carolina	37155	Mod	Low	Mod	Low	Q3	Mod
Rockingham	North Carolina	37157	Mod	High	Low	Low	NOQ3	Mod
Rowan	North Carolina	37159	Mod	Mod	Low	Low	Q3	Mod
Rutherford	North Carolina	37161	Mod	High	Low	Low	Q3	Mod
Sampson	North Carolina	37163	Mod	Low	High	Low	Q3	Mod
Scotland	North Carolina	37165	Mod	Low	Mod	Mod	Q3	Mod
Stanly	North Carolina	37167	Mod	High	Mod	Mod	NOQ3	Mod
Stokes	North Carolina	37169	Mod	High	Low	Low	Q3	Mod
Surry	North Carolina	37171	Mod	High	Low	Low	NOQ3	Mod
Swain	North Carolina	37173	Mod	High	Low	Low	NOQ3	Mod
Transylvania	North Carolina	37175	Mod	High	Low	Low	NOQ3	Mod
Tyrrell	North Carolina	37177	Low	Low	High	Low	NOQ3	Low
Union	North Carolina	37179	Mod	Mod	Mod	Mod	NOQ3	Mod
Vance	North Carolina	37181	Low	Mod	Low	Low	Q3	Mod
Wake	North Carolina	37183	Low	Mod	Mod	Mod	Q3	Mod
Warren	North Carolina	37185	Low	Low	Mod	Low	Q3	Mod
Washington	North Carolina	37187	Low	Low	High	Low	NOQ3	Mod
Watauga	North Carolina	37189	Mod	High	Low	Low	Q3	Mod
Wayne	North Carolina	37191	Low	Low	Mod	Mod	Q3	Mod
Wilkes	North Carolina	37193	Mod	High	Low	Low	NOQ3	Mod
Wilson	North Carolina	37195	Low	Low	Mod	Low	Q3	Mod
Yadkin	North Carolina	37197	Mod	High	Low	Low	NOQ3	Mod
Yancey	North Carolina	37199	Mod	High	Low	Low	NOQ3	Mod
Adams	North Dakota	38001	Low	Mod	Low	Low	Q3	Mod
Barnes	North Dakota	38003	Low	Low	Low	Low	Q3	Mod
Benson	North Dakota	38005	Low	Low	Low	Low	NOQ3	Mod
Billings	North Dakota	38007	Low	Mod	Low	Low	Q3	Mod
Bottineau	North Dakota	38009	Low	Mod	Low	Low	Q3	Mod
Bowman	North Dakota	38011	Low	High	Low	Low	Q3	Mod
Burke	North Dakota	38013	Low	High	Low	Low	Q3	Mod
Burleigh	North Dakota	38015	Low	Mod	Low	Low	Q3	Mod
Cass	North Dakota	38017	Low	Low	Mod	Mod	Q3	Mod
Cavalier	North Dakota	38019	Low	Low	Low	Low	Q3	Mod
Dickey	North Dakota	38021	Low	Low	Low	Low	NOQ3	Mod
Divide	North Dakota	38023	Mod	Low	Low	Low	Q3	Mod
Dunn	North Dakota	38025	Low	Mod	Low	Low	Q3	Mod
Eddy	North Dakota	38027	Low	Low	Low	Low	Q3	Mod

County	State	FIPS	EQ	LS	Wind	Torn	Flood	Icing
Emmons	North Dakota	38029	Low	High	Low	Low	Q3	Mod
Foster	North Dakota	38031	Low	Low	Low	Low	NOQ3	Mod
Golden Valley	North Dakota	38033	Low	Mod	Low	Low	Q3	Mod
Grand Forks	North Dakota	38035	Low	Low	Low	Low	Q3	Mod
Grant	North Dakota	38037	Low	Mod	Low	Low	NOQ3	Mod
Griggs	North Dakota	38039	Low	Low	Mod	Mod	Q3	Mod
Hettinger	North Dakota	38041	Low	Mod	Low	Low	Q3	Mod
Kidder	North Dakota	38043	Low	Mod	Low	Low	Q3	Mod
La Moure	North Dakota	38045	Low	Low	Low	Low	Q3	Mod
Logan	North Dakota	38047	Low	Mod	Low	Low	Q3	Mod
McHenry	North Dakota	38049	Low	Low	Low	Low	Q3	Mod
McIntosh	North Dakota	38051	Low	Mod	Low	Low	Q3	Mod
McKenzie	North Dakota	38053	Low	Mod	Low	Low	Q3	Mod
McLean	North Dakota	38055	Low	Mod	Low	Low	NOQ3	Mod
Mercer	North Dakota	38057	Low	Mod	Low	Low	Q3	Mod
Morton	North Dakota	38059	Low	High	Low	Low	Q3	Mod
Mountrial	North Dakota	38061	Low	Mod	Low	Low	Q3	Mod
Nelson	North Dakota	38063	Low	Low	Low	Low	Q3	Mod
Oliver	North Dakota	38065	Low	Mod	Low	Low	Q3	Mod
Pembina	North Dakota	38067	Low	Low	Low	Low	Q3	Mod
Pierce	North Dakota	38069	Low	Low	Low	Low	Q3	Mod
Ramsey	North Dakota	38071	Low	Low	Mod	Mod	Q3	Mod
Ransom	North Dakota	38073	Low	Low	Low	Low	Q3	Mod
Renville	North Dakota	38075	Low	High	Low	Low	Q3	Mod
Richland	North Dakota	38077	Low	Low	Low	Low	Q3	Mod
Rolette	North Dakota	38079	Low	Mod	Low	Low	Q3	Mod
Sargent	North Dakota	38081	Low	Low	Low	Low	NOQ3	Mod
Sheridan	North Dakota	38083	Low	Low	Low	Low	NOQ3	Mod
Sioux	North Dakota	38085	Low	High	Low	Low	Q3	Mod
Slope	North Dakota	38087	Low	High	Low	Low	Q3	Mod
Stark	North Dakota	38089	Low	Mod	Low	Low	Q3	Mod
Steele	North Dakota	38091	Low	Low	Mod	Mod	NOQ3	Mod
Stutsman	North Dakota	38093	Low	Low	Low	Low	Q3	Mod
Towner	North Dakota	38095	Low	Mod	Low	Low	NOQ3	Mod
Traill	North Dakota	38097	Low	Low	Low	Low	Q3	Mod
Walsh	North Dakota	38099	Low	Low	Low	Low	Q3	Mod
Ward	North Dakota	38101	Low	High	Low	Low	Q3	Mod
Wells	North Dakota	38103	Low	Low	Low	Low	Q3	Mod
Williams	North Dakota	38105	Mod	Mod	Low	Low	Q3	Mod
Adams	Ohio	39001	Mod	High	Low	Low	Q3	Mod
Allen	Ohio	39003	Mod	Mod	Mod	Mod	Q3	Mod
Ashland	Ohio	39005	Low	Low	Mod	Mod	NOQ3	Mod
Ashtabula	Ohio	39007	Mod	High	Low	Low	NOQ3	Mod
Athens	Ohio	39009	Low	High	Low	Low	Q3	Mod
Auglaize	Ohio	39011	Mod	Mod	Low	Low	NOQ3	Mod
Belmont	Ohio	39013	Low	High	Low	Low	Q3	Mod
Brown	Ohio	39015	Mod	High	Low	Low	Q3	Mod

County	State	FIPS	EQ	LS	Wind	Torn	Flood	Icing
Butler	Ohio	39017	Low	High	Mod	Mod	Q3	Mod
Carroll	Ohio	39019	Low	High	Low	Low	Q3	Mod
Champaign	Ohio	39021	Mod	Low	Low	Low	NOQ3	Mod
Clark	Ohio	39023	Mod	Low	Mod	Mod	NOQ3	Mod
Clermont	Ohio	39025	Mod	High	Low	Low	Q3	Mod
Clinton	Ohio	39027	Low	Mod	Mod	Mod	NOQ3	Mod
Columbiana	Ohio	39029	Low	High	Mod	Mod	Q3	Mod
Coshocton	Ohio	39031	Low	High	Low	Low	NOQ3	Mod
Crawford	Ohio	39033	Low	Mod	Mod	Mod	Q3	Mod
Cuyahoga	Ohio	39035	Mod	High	Mod	Mod	Q3	Mod
Darke	Ohio	39037	Mod	Mod	Mod	Mod	NOQ3	Mod
Defiance	Ohio	39039	Low	Mod	Low	Low	NOQ3	High
Delaware	Ohio	39041	Low	Mod	Low	Low	Q3	Mod
Erie	Ohio	39043	Low	Mod	Mod	Mod	Q3	Mod
Fairfield	Ohio	39045	Low	High	Low	Low	Q3	Mod
Fayette	Ohio	39047	Low	Low	Low	Low	NOQ3	Mod
Franklin	Ohio	39049	Low	Mod	Mod	Mod	Q3	Mod
Fulton	Ohio	39051	Low	Mod	Mod	Mod	NOQ3	High
Gallia	Ohio	39053	Low	High	Low	Low	Q3	Mod
Geauga	Ohio	39055	Mod	Mod	Low	Low	NOQ3	Mod
Greene	Ohio	39057	Mod	Low	Mod	Mod	Q3	Mod
Guernsey	Ohio	39059	Low	High	Low	Low	NOQ3	Mod
Hamilton	Ohio	39061	Low	High	Mod	Mod	Q3	Mod
Hancock	Ohio	39063	Mod	Low	Low	Low	Q3	High
Hardin	Ohio	39065	Mod	Mod	Low	Low	NOQ3	Mod
Harrison	Ohio	39067	Low	High	Low	Low	NOQ3	Mod
Henry	Ohio	39069	Low	Mod	Low	Low	NOQ3	High
Highland	Ohio	39071	Low	Low	Mod	Mod	NOQ3	Mod
Hocking	Ohio	39073	Low	High	Low	Low	Q3	Mod
Holmes	Ohio	39075	Low	Low	Low	Low	NOQ3	Mod
Huron	Ohio	39077	Low	Low	Mod	Mod	Q3	Mod
Jackson	Ohio	39079	Low	High	Low	Low	Q3	Mod
Jefferson	Ohio	39081	Low	High	Low	Low	Q3	Mod
Knox	Ohio	39083	Low	Low	Low	Low	NOQ3	Mod
Lake	Ohio	39085	Mod	Mod	Low	Low	Q3	Mod
Lawrence	Ohio	39087	Mod	High	Low	Low	Q3	Mod
Licking	Ohio	39089	Low	High	Low	Low	Q3	Mod
Logan	Ohio	39091	Mod	Low	Low	Low	NOQ3	Mod
Lorain	Ohio	39093	Low	Mod	Mod	Mod	Q3	Mod
Lucas	Ohio	39095	Low	High	Low	Low	Q3	High
Madison	Ohio	39097	Mod	Low	Low	Low	NOQ3	Mod
Mahoning	Ohio	39099	Low	High	Mod	Mod	Q3	Mod
Marion	Ohio	39101	Mod	Low	Mod	Mod	NOQ3	Mod
Medina	Ohio	39103	Mod	Low	Mod	Mod	Q3	Mod
Meigs	Ohio	39105	Low	High	Low	Low	Q3	Mod
Mercer	Ohio	39107	Mod	Mod	Mod	Mod	NOQ3	High
Miami	Ohio	39109	Mod	Low	Mod	Mod	NOQ3	Mod

County	State	FIPS	EQ	LS	Wind	Torn	Flood	Icing
Monroe	Ohio	39111	Low	High	Low	Low	Q3	Mod
Montgomery	Ohio	39113	Mod	Low	Low	Low	Q3	Mod
Morgan	Ohio	39115	Low	High	Low	Low	Q3	Mod
Morrow	Ohio	39117	Low	Low	Mod	Mod	NOQ3	Mod
Muskingum	Ohio	39119	Low	High	Low	Low	NOQ3	Mod
Noble	Ohio	39121	Low	High	Low	Low	NOQ3	Mod
Ottawa	Ohio	39123	Low	Mod	Low	Low	Q3	High
Paulding	Ohio	39125	Mod	Mod	Low	Low	NOQ3	High
Perry	Ohio	39127	Low	High	Low	Low	NOQ3	Mod
Pickaway	Ohio	39129	Low	Mod	Mod	Mod	NOQ3	Mod
Pike	Ohio	39131	Low	Mod	Low	Low	Q3	Mod
Portage	Ohio	39133	Mod	Mod	Low	Low	NOQ3	Mod
Preble	Ohio	39135	Mod	Low	Low	Low	NOQ3	Mod
Putnam	Ohio	39137	Mod	Mod	Mod	Mod	NOQ3	High
Richland	Ohio	39139	Low	Mod	Mod	Mod	Q3	Mod
Ross	Ohio	39141	Low	Mod	Low	Low	Q3	Mod
Sandusky	Ohio	39143	Low	Mod	Low	Low	NOQ3	High
Scioto	Ohio	39145	Mod	Mod	Low	Low	Q3	Mod
Seneca	Ohio	39147	Low	Low	Mod	Mod	Q3	Mod
Shelby	Ohio	39149	Mod	Low	Low	Low	NOQ3	Mod
Stark	Ohio	39151	Low	High	Low	Low	Q3	Mod
Summit	Ohio	39153	Mod	High	Low	Low	Q3	Mod
Trumbull	Ohio	39155	Mod	High	Low	Low	Q3	Mod
Tuscarawas	Ohio	39157	Low	High	Low	Low	NOQ3	Mod
Union	Ohio	39159	Mod	Low	Low	Low	NOQ3	Mod
Van Wert	Ohio	39161	Mod	Low	Low	Low	NOQ3	High
Vinton	Ohio	39163	Low	High	Low	Low	Q3	Mod
Warren	Ohio	39165	Low	High	Mod	Mod	Q3	Mod
Washington	Ohio	39167	Low	High	Low	Low	Q3	Mod
Wayne	Ohio	39169	Low	Low	Low	Low	Q3	Mod
Williams	Ohio	39171	Low	Mod	Low	Low	NOQ3	High
Wood	Ohio	39173	Low	High	Low	Low	Q3	High
Wyandot	Ohio	39175	Mod	Low	Mod	Mod	NOQ3	Mod
Adair	Oklahoma	40001	Low	Mod	Low	Low	NOQ3	High
Alfalfa	Oklahoma	40003	Low	Low	Mod	Mod	NOQ3	Mod
Atoka	Oklahoma	40005	Mod	High	Mod	Mod	NOQ3	High
Beaver	Oklahoma	40007	Low	Low	Low	Low	NOQ3	Mod
Beckham	Oklahoma	40009	Mod	Low	Mod	Mod	NOQ3	Mod
Blaine	Oklahoma	40011	Mod	Low	Mod	Mod	NOQ3	Mod
Bryan	Oklahoma	40013	Mod	Mod	Mod	Mod	NOQ3	Mod
Caddo	Oklahoma	40015	Mod	Low	Mod	Mod	NOQ3	Mod
Canadian	Oklahoma	40017	Mod	Low	Mod	Mod	Q3	Mod
Carter	Oklahoma	40019	Mod	Low	Mod	Mod	NOQ3	Mod
Cherokee	Oklahoma	40021	Low	Mod	Low	Low	NOQ3	High
Choctaw	Oklahoma	40023	Low	Mod	Low	Low	NOQ3	High
Cimarron	Oklahoma	40025	Low	High	Low	Low	NOQ3	Mod
Cleveland	Oklahoma	40027	Mod	Low	Mod	Mod	Q3	Mod

County	State	FIPS	EQ	LS	Wind	Torn	Flood	Icing
Coal	Oklahoma	40029	Mod	High	Mod	Mod	NOQ3	High
Comanche	Oklahoma	40031	Mod	Low	Mod	Mod	Q3	Mod
Cotton	Oklahoma	40033	Mod	Low	Mod	Mod	NOQ3	Mod
Craig	Oklahoma	40035	Low	Low	Mod	Mod	NOQ3	High
Creek	Oklahoma	40037	Low	Mod	Mod	Mod	Q3	High
Custer	Oklahoma	40039	Mod	Low	Mod	Mod	NOQ3	Mod
Delaware	Oklahoma	40041	Low	Low	Mod	Mod	NOQ3	High
Dewey	Oklahoma	40043	Mod	Low	Mod	Mod	NOQ3	Mod
Ellis	Oklahoma	40045	Low	Low	Mod	Mod	NOQ3	Mod
Garfield	Oklahoma	40047	Mod	Low	Mod	Mod	Q3	Mod
Garvin	Oklahoma	40049	Mod	Low	Mod	Mod	NOQ3	Mod
Grady	Oklahoma	40051	Mod	Low	Mod	Mod	Q3	Mod
Grant	Oklahoma	40053	Low	Low	Mod	Mod	NOQ3	Mod
Greer	Oklahoma	40055	Mod	Low	Mod	Mod	NOQ3	Mod
Harmon	Oklahoma	40057	Low	Low	Mod	Mod	NOQ3	Mod
Harper	Oklahoma	40059	Low	Low	Low	Low	NOQ3	Mod
Haskell	Oklahoma	40061	Low	High	Low	Low	NOQ3	High
Hughes	Oklahoma	40063	Mod	Low	Mod	Mod	NOQ3	High
Jackson	Oklahoma	40065	Mod	Low	Mod	Mod	NOQ3	Mod
Jefferson	Oklahoma	40067	Mod	Low	Mod	Mod	NOQ3	Mod
Johnston	Oklahoma	40069	Mod	Mod	Mod	Mod	NOQ3	Mod
Kay	Oklahoma	40071	Low	Low	Mod	Mod	Q3	Mod
Kingfisher	Oklahoma	40073	Mod	Low	Mod	Mod	NOQ3	Mod
Kiowa	Oklahoma	40075	Mod	Low	Mod	Mod	NOQ3	Mod
Latimer	Oklahoma	40077	Low	High	Low	Low	NOQ3	High
Le Flore	Oklahoma	40079	Low	High	Low	Low	NOQ3	High
Lincoln	Oklahoma	40081	Mod	Low	Mod	Mod	NOQ3	High
Logan	Oklahoma	40083	Mod	Low	Mod	Mod	NOQ3	Mod
Love	Oklahoma	40085	Mod	Mod	Mod	Mod	NOQ3	Mod
Major	Oklahoma	40093	Mod	Low	Mod	Mod	NOQ3	Mod
Marshall	Oklahoma	40095	Mod	Mod	Mod	Mod	NOQ3	Mod
Mayes	Oklahoma	40097	Low	Mod	Mod	Mod	NOQ3	High
McClain	Oklahoma	40087	Mod	Low	Mod	Mod	NOQ3	Mod
McCurtain	Oklahoma	40089	Low	Mod	Low	Low	NOQ3	High
McIntosh	Oklahoma	40091	Low	High	Mod	Mod	NOQ3	High
Murray	Oklahoma	40099	Mod	Low	Mod	Mod	NOQ3	Mod
Muskogee	Oklahoma	40101	Low	High	Mod	Mod	NOQ3	High
Noble	Oklahoma	40103	Mod	Low	Mod	Mod	NOQ3	Mod
Nowata	Oklahoma	40105	Low	Low	Mod	Mod	NOQ3	High
Okfuskee	Oklahoma	40107	Mod	Low	Mod	Mod	NOQ3	High
Oklahoma	Oklahoma	40109	Mod	Low	Mod	Mod	Q3	Mod
Okmulgee	Oklahoma	40111	Low	Low	Mod	Mod	NOQ3	High
Osage	Oklahoma	40113	Low	High	Low	Low	Q3	High
Ottawa	Oklahoma	40115	Low	Low	Mod	Mod	Q3	High
Pawnee	Oklahoma	40117	Low	Mod	Mod	Mod	NOQ3	High
Payne	Oklahoma	40119	Mod	Low	Mod	Mod	Q3	High
Pittsburg	Oklahoma	40121	Mod	High	Mod	Mod	NOQ3	High

County	State	FIPS	EQ	LS	Wind	Torn	Flood	Icing
Pontotoc	Oklahoma	40123	Mod	Low	Mod	Mod	NOQ3	High
Pottawatomie	Oklahoma	40125	Mod	Low	Mod	Mod	NOQ3	High
Pushmataha	Oklahoma	40127	Low	Mod	Low	Low	NOQ3	High
Roger Mills	Oklahoma	40129	Low	Low	Mod	Mod	NOQ3	Mod
Rogers	Oklahoma	40131	Low	Low	Mod	Mod	NOQ3	High
Seminole	Oklahoma	40133	Mod	Low	Mod	Mod	NOQ3	High
Sequoyah	Oklahoma	40135	Low	Mod	Mod	Mod	NOQ3	High
Stephens	Oklahoma	40137	Mod	Low	Mod	Mod	NOQ3	Mod
Texas	Oklahoma	40139	Low	Low	Low	Low	NOQ3	Mod
Tillman	Oklahoma	40141	Mod	Low	Mod	Mod	NOQ3	Mod
Tulsa	Oklahoma	40143	Low	High	Mod	Mod	Q3	High
Wagoner	Oklahoma	40145	Low	High	Mod	Mod	NOQ3	High
Washington	Oklahoma	40147	Low	Mod	Mod	Mod	NOQ3	High
Washita	Oklahoma	40149	Mod	Low	Mod	Mod	NOQ3	Mod
Woods	Oklahoma	40151	Low	Low	Mod	Mod	NOQ3	Mod
Woodward	Oklahoma	40153	Low	Low	Mod	Mod	NOQ3	Mod
Baker	Oregon	41001	Mod	High	Low	Low	NOQ3	Low
Benton	Oregon	41003	High	Mod	Low	Low	Q3	Mod
Clackamas	Oregon	41005	Mod	High	Low	Low	Q3	High
Clatsop	Oregon	41007	High	High	Low	Low	Q3	Low
Columbia	Oregon	41009	Mod	High	Low	Low	Q3	Mod
Coos	Oregon	41011	High	High	Low	Low	Q3	Low
Crook	Oregon	41013	Mod	High	Low	Low	NOQ3	Low
Curry	Oregon	41015	High	High	Low	Low	NOQ3	Low
Deschutes	Oregon	41017	Mod	High	Low	Low	Q3	Low
Douglas	Oregon	41019	High	High	Low	Low	Q3	Low
Gilliam	Oregon	41021	Mod	High	Low	Low	Q3	Low
Grant	Oregon	41023	Mod	High	Low	Low	NOQ3	Low
Harney	Oregon	41025	Mod	High	Low	Low	NOQ3	Low
Hood River	Oregon	41027	Mod	Mod	Low	Low	Q3	High
Jackson	Oregon	41029	Mod	High	Low	Low	Q3	Low
Jefferson	Oregon	41031	Mod	High	Low	Low	Q3	Low
Josephine	Oregon	41033	High	High	Low	Low	Q3	Low
Klamath	Oregon	41035	High	Mod	Low	Low	NOQ3	Low
Lake	Oregon	41037	Mod	High	Low	Low	NOQ3	Low
Lane	Oregon	41039	High	High	Low	Low	Q3	Mod
Lincoln	Oregon	41041	High	High	Low	Low	Q3	Low
Linn	Oregon	41043	Mod	High	Low	Low	Q3	Mod
Malheur	Oregon	41045	Mod	High	Low	Low	NOQ3	Low
Marion	Oregon	41047	Mod	High	Low	Low	Q3	Mod
Morrow	Oregon	41049	Mod	High	Low	Low	Q3	Low
Multnomah	Oregon	41051	Mod	High	Low	Low	Q3	High
Polk	Oregon	41053	Mod	Mod	Low	Low	Q3	Mod
Sherman	Oregon	41055	Mod	Low	Low	Low	Q3	Low
Tillamook	Oregon	41057	High	High	Low	Low	Q3	Low
Umatilla	Oregon	41059	Mod	Low	Low	Low	Q3	Low
Union	Oregon	41061	Mod	High	Low	Low	Q3	Low

County	State	FIPS	EQ	LS	Wind	Torn	Flood	Icing
Wallowa	Oregon	41063	Mod	High	Low	Low	Q3	Low
Wasco	Oregon	41065	Mod	High	Low	Low	Q3	Mod
Washington	Oregon	41067	Mod	High	Low	Low	Q3	High
Wheeler	Oregon	41069	Mod	High	Low	Low	Q3	Low
Yamhill	Oregon	41071	High	Mod	Low	Low	Q3	Mod
Adams	Pennsylvania	42001	Low	High	Low	Low	Q3	Mod
Allegheny	Pennsylvania	42003	Low	High	Low	Low	Q3	Mod
Armstrong	Pennsylvania	42005	Low	High	Low	Low	Q3	Mod
Beaver	Pennsylvania	42007	Low	High	Mod	Mod	Q3	Mod
Bedford	Pennsylvania	42009	Low	High	Low	Low	Q3	Mod
Berks	Pennsylvania	42011	Mod	High	Low	Low	Q3	High
Blair	Pennsylvania	42013	Low	High	Low	Low	Q3	Mod
Bradford	Pennsylvania	42015	Low	Mod	Low	Low	Q3	Mod
Bucks	Pennsylvania	42017	Mod	Mod	Mod	Mod	Q3	High
Butler	Pennsylvania	42019	Low	High	Low	Low	Q3	Mod
Cambria	Pennsylvania	42021	Low	High	Low	Low	Q3	Mod
Cameron	Pennsylvania	42023	Low	High	Low	Low	NOQ3	Mod
Carbon	Pennsylvania	42025	Mod	High	Low	Low	Q3	Mod
Centre	Pennsylvania	42027	Low	High	Low	Low	NOQ3	Mod
Chester	Pennsylvania	42029	Mod	Low	Mod	Mod	Q3	High
Clarion	Pennsylvania	42031	Low	High	Low	Low	Q3	Mod
Clearfield	Pennsylvania	42033	Low	High	Low	Low	Q3	Mod
Clinton	Pennsylvania	42035	Low	High	Low	Low	Q3	Mod
Columbia	Pennsylvania	42037	Mod	High	Low	Low	Q3	Mod
Crawford	Pennsylvania	42039	Low	Low	Low	Low	Q3	Mod
Cumberland	Pennsylvania	42041	Mod	High	Low	Low	Q3	Mod
Dauphin	Pennsylvania	42043	Mod	High	Low	Low	Q3	Mod
Delaware	Pennsylvania	42045	Mod	Mod	Low	Low	Q3	High
Elk	Pennsylvania	42047	Low	High	Low	Low	NOQ3	Mod
Erie	Pennsylvania	42049	Low	Mod	Low	Low	Q3	Mod
Fayette	Pennsylvania	42051	Low	High	Low	Low	Q3	Mod
Forest	Pennsylvania	42053	Low	High	Low	Low	NOQ3	Mod
Franklin	Pennsylvania	42055	Low	High	Low	Low	Q3	Mod
Fulton	Pennsylvania	42057	Low	High	Low	Low	NOQ3	Mod
Greene	Pennsylvania	42059	Low	High	Low	Low	NOQ3	Mod
Huntingdon	Pennsylvania	42061	Low	High	Low	Low	NOQ3	Mod
Indiana	Pennsylvania	42063	Low	High	Low	Low	Q3	Mod
Jefferson	Pennsylvania	42065	Low	High	Low	Low	NOQ3	Mod
Juniata	Pennsylvania	42067	Low	High	Low	Low	NOQ3	Mod
Lackawanna	Pennsylvania	42069	Mod	High	Low	Low	Q3	Mod
Lancaster	Pennsylvania	42071	Mod	Low	Low	Low	Q3	High
Lawrence	Pennsylvania	42073	Low	High	Mod	Mod	Q3	Mod
Lebanon	Pennsylvania	42075	Mod	High	Mod	Mod	Q3	High
Lehigh	Pennsylvania	42077	Mod	High	Mod	Mod	Q3	High
Luzerne	Pennsylvania	42079	Mod	High	Low	Low	Q3	Mod
Lycoming	Pennsylvania	42081	Low	High	Low	Low	Q3	Mod
McKean	Pennsylvania	42083	Low	High	Low	Low	NOQ3	Mod

County	State	FIPS	EQ	LS	Wind	Torn	Flood	Icing
Mercer	Pennsylvania	42085	Low	High	Low	Low	NOQ3	Mod
Mifflin	Pennsylvania	42087	Low	High	Low	Low	Q3	Mod
Monroe	Pennsylvania	42089	Mod	High	Low	Low	NOQ3	Mod
Montgomery	Pennsylvania	42091	Mod	Low	Mod	Mod	Q3	High
Montour	Pennsylvania	42093	Low	High	Low	Low	NOQ3	Mod
Northampton	Pennsylvania	42095	Mod	High	Mod	Mod	Q3	High
Northumberland	Pennsylvania	42097	Mod	High	Low	Low	Q3	Mod
Perry	Pennsylvania	42099	Low	High	Low	Low	Q3	Mod
Philadelphia	Pennsylvania	42101	Mod	Mod	Mod	Mod	Q3	High
Pike	Pennsylvania	42103	Mod	High	Low	Low	NOQ3	Mod
Potter	Pennsylvania	42105	Low	Mod	Low	Low	NOQ3	Mod
Schuylkill	Pennsylvania	42107	Mod	High	Low	Low	Q3	Mod
Snyder	Pennsylvania	42109	Low	High	Low	Low	Q3	Mod
Somerset	Pennsylvania	42111	Low	High	Low	Low	Q3	Mod
Sullivan	Pennsylvania	42113	Low	Mod	Low	Low	NOQ3	Mod
Susquehanna	Pennsylvania	42115	Low	High	Low	Low	NOQ3	Mod
Tioga	Pennsylvania	42117	Low	Mod	Low	Low	NOQ3	Mod
Union	Pennsylvania	42119	Low	High	Low	Low	Q3	Mod
Venango	Pennsylvania	42121	Low	High	Low	Low	NOQ3	Mod
Warren	Pennsylvania	42123	Low	High	Low	Low	Q3	Mod
Washington	Pennsylvania	42125	Low	High	Low	Low	Q3	Mod
Wayne	Pennsylvania	42127	Mod	High	Low	Low	NOQ3	Mod
Westmoreland	Pennsylvania	42129	Low	High	Mod	Mod	Q3	Mod
Wyoming	Pennsylvania	42131	Mod	Mod	Low	Low	Q3	Mod
York	Pennsylvania	42133	Mod	High	Low	Low	Q3	Mod
Bristol	Rhode Island	44001	Mod	Low	High	Mod	Q3	Mod
Kent	Rhode Island	44003	Mod	Low	High	Low	Q3	Mod
Newport	Rhode Island	44005	Mod	Low	High	Low	Q3	Mod
Providence	Rhode Island	44007	Mod	Low	High	Low	Q3	Mod
Washington	Rhode Island	44009	Mod	Low	High	Low	Q3	Mod
Abbeville	South Carolina	45001	Mod	Mod	Low	Low	NOQ3	Mod
Aiken	South Carolina	45003	Mod	Low	Mod	Low	NOQ3	Mod
Allendale	South Carolina	45005	Mod	Low	Mod	Low	NOQ3	Mod
Anderson	South Carolina	45007	Mod	High	Low	Low	NOQ3	Mod
Bamberg	South Carolina	45009	Mod	Low	Mod	Low	NOQ3	Mod
Barnwell	South Carolina	45011	Mod	Low	Mod	Low	NOQ3	Mod
Beaufort	South Carolina	45013	Mod	Low	High	Low	Q3	Low
Berkeley	South Carolina	45015	High	Low	High	Low	Q3	Mod
Calhoun	South Carolina	45017	Mod	Low	Mod	Low	NOQ3	Mod
Charleston	South Carolina	45019	High	Low	High	Low	Q3	Low
Cherokee	South Carolina	45021	Mod	High	Mod	Mod	NOQ3	Mod
Chester	South Carolina	45023	Mod	Mod	Mod	Low	NOQ3	Mod
Chesterfield	South Carolina	45025	Mod	Mod	Mod	Low	NOQ3	Mod
Clarendon	South Carolina	45027	High	Low	Mod	Low	NOQ3	Mod
Colleton	South Carolina	45029	High	Low	High	Low	Q3	Mod
Darlington	South Carolina	45031	Mod	Low	Mod	Low	NOQ3	Mod
Dillon	South Carolina	45033	Mod	Low	Mod	Low	NOQ3	Mod

County	State	FIPS	EQ	LS	Wind	Torn	Flood	Icing
Dorchester	South Carolina	45035	High	Low	High	Low	NOQ3	Mod
Edgefield	South Carolina	45037	Mod	Low	Mod	Low	NOQ3	Mod
Fairfield	South Carolina	45039	Mod	Mod	Mod	Low	NOQ3	Mod
Florence	South Carolina	45041	High	Low	High	Mod	NOQ3	Mod
Georgetown	South Carolina	45043	High	Low	High	Low	Q3	Low
Greenville	South Carolina	45045	Mod	High	Mod	Mod	Q3	Mod
Greenwood	South Carolina	45047	Mod	Mod	Mod	Mod	NOQ3	Mod
Hampton	South Carolina	45049	Mod	Low	High	Low	Q3	Mod
Horry	South Carolina	45051	Mod	Low	High	Mod	Q3	Mod
Jasper	South Carolina	45053	Mod	Low	High	Low	Q3	Low
Kershaw	South Carolina	45055	Mod	Low	Mod	Low	NOQ3	Mod
Lancaster	South Carolina	45057	Mod	Mod	Mod	Low	NOQ3	Mod
Laurens	South Carolina	45059	Mod	Mod	Low	Low	NOQ3	Mod
Lee	South Carolina	45061	Mod	Low	Mod	Low	NOQ3	Mod
Lexington	South Carolina	45063	Mod	Mod	Mod	Mod	Q3	Mod
Marion	South Carolina	45067	High	Low	High	Low	NOQ3	Mod
Marlboro	South Carolina	45069	Mod	Low	Mod	Low	NOQ3	Mod
McCormick	South Carolina	45065	Mod	Mod	Mod	Low	NOQ3	Mod
Newberry	South Carolina	45071	Mod	Mod	Mod	Mod	NOQ3	Mod
Oconee	South Carolina	45073	Mod	High	Low	Low	NOQ3	Mod
Orangeburg	South Carolina	45075	High	Low	High	Mod	NOQ3	Mod
Pickens	South Carolina	45077	Mod	High	Mod	Mod	NOQ3	Mod
Richland	South Carolina	45079	Mod	Mod	Mod	Mod	Q3	Mod
Saluda	South Carolina	45081	Mod	Mod	Mod	Low	Q3	Mod
Spartanburg	South Carolina	45083	Mod	High	Mod	Mod	Q3	Mod
Sumter	South Carolina	45085	Mod	Low	Mod	Low	Q3	Mod
Union	South Carolina	45087	Mod	Mod	Low	Low	NOQ3	Mod
Williamsburg	South Carolina	45089	High	Low	High	Low	NOQ3	Mod
York	South Carolina	45091	Mod	Mod	Low	Low	NOQ3	Mod
Aurora	South Dakota	46003	Mod	Mod	Low	Low	Q3	Mod
Beadle	South Dakota	46005	Mod	Low	Low	Low	Q3	Mod
Bennett	South Dakota	46007	Low	Low	Low	Low	NOQ3	Mod
Bon Homme	South Dakota	46009	Low	High	Mod	Mod	NOQ3	Mod
Brookings	South Dakota	46011	Low	Low	Mod	Mod	Q3	Mod
Brown	South Dakota	46013	Low	Low	Mod	Mod	Q3	Mod
Brule	South Dakota	46015	Mod	High	Low	Low	NOQ3	Mod
Buffalo	South Dakota	46017	Mod	High	Mod	Mod	NOQ3	Mod
Butte	South Dakota	46019	Low	High	Low	Low	Q3	Mod
Campbell	South Dakota	46021	Low	High	Low	Low	Q3	Mod
Charles Mix	South Dakota	46023	Low	High	Mod	Mod	Q3	Mod
Clark	South Dakota	46025	Low	Low	Low	Low	Q3	Mod
Clay	South Dakota	46027	Low	High	Mod	Mod	Q3	Mod
Codington	South Dakota	46029	Low	Low	Mod	Mod	Q3	Mod
Corson	South Dakota	46031	Low	High	Low	Low	NOQ3	Mod
Custer	South Dakota	46033	Low	High	Low	Low	Q3	Mod
Davison	South Dakota	46035	Low	Low	Mod	Mod	Q3	Mod
Day	South Dakota	46037	Low	Low	Low	Low	NOQ3	Mod

County	State	FIPS	EQ	LS	Wind	Torn	Flood	Icing
Deuel	South Dakota	46039	Low	Low	Low	Low	Q3	Mod
Dewey	South Dakota	46041	Low	High	Low	Low	Q3	Mod
Douglas	South Dakota	46043	Low	Low	Mod	Mod	Q3	Mod
Edmunds	South Dakota	46045	Low	Low	Low	Low	Q3	Mod
Fall River	South Dakota	46047	Low	High	Low	Low	Q3	Low
Faulk	South Dakota	46049	Low	Low	Low	Low	Q3	Mod
Grant	South Dakota	46051	Low	Low	Low	Low	Q3	Mod
Gregory	South Dakota	46053	Low	High	Low	Low	NOQ3	Mod
Haakon	South Dakota	46055	Low	High	Low	Low	Q3	Mod
Hamlin	South Dakota	46057	Low	Low	Low	Low	Q3	Mod
Hand	South Dakota	46059	Mod	Mod	Low	Low	Q3	Mod
Hanson	South Dakota	46061	Low	Low	Low	Low	Q3	Mod
Harding	South Dakota	46063	Low	High	Low	Low	Q3	Mod
Hughes	South Dakota	46065	Low	High	Low	Low	Q3	Mod
Hutchinson	South Dakota	46067	Low	Mod	Mod	Mod	Q3	Mod
Hyde	South Dakota	46069	Low	High	Low	Low	NOQ3	Mod
Jackson	South Dakota	46071	Low	High	Low	Low	Q3	Mod
Jerauld	South Dakota	46073	Mod	Mod	Low	Low	NOQ3	Mod
Jones	South Dakota	46075	Low	High	Low	Low	NOQ3	Mod
Kingsbury	South Dakota	46077	Low	Low	Low	Low	Q3	Mod
Lake	South Dakota	46079	Low	Low	Mod	Mod	Q3	Mod
Lawrence	South Dakota	46081	Low	High	Low	Low	Q3	Low
Lincoln	South Dakota	46083	Low	Low	Mod	Mod	Q3	Mod
Lyman	South Dakota	46085	Low	High	Low	Low	Q3	Mod
Marshall	South Dakota	46091	Low	Low	Low	Low	Q3	Mod
McCook	South Dakota	46087	Low	Low	Mod	Mod	Q3	Mod
McPherson	South Dakota	46089	Low	Low	Low	Low	Q3	Mod
Meade	South Dakota	46093	Low	High	Low	Low	Q3	Mod
Mellette	South Dakota	46095	Low	High	Low	Low	NOQ3	Mod
Miner	South Dakota	46097	Low	Low	Mod	Mod	Q3	Mod
Minnehaha	South Dakota	46099	Low	Low	Mod	Mod	Q3	Mod
Moody	South Dakota	46101	Low	Low	Low	Low	Q3	Mod
Pennington	South Dakota	46103	Low	High	Low	Low	Q3	Mod
Perkins	South Dakota	46105	Low	High	Low	Low	Q3	Mod
Potter	South Dakota	46107	Low	High	Low	Low	NOQ3	Mod
Roberts	South Dakota	46109	Low	Low	Low	Low	Q3	Mod
Sanborn	South Dakota	46111	Mod	Low	Low	Low	Q3	Mod
Shannon	South Dakota	46113	Low	High	Low	Low	Q3	Mod
Spink	South Dakota	46115	Low	Low	Mod	Mod	Q3	Mod
Stanley	South Dakota	46117	Low	High	Low	Low	Q3	Mod
Sully	South Dakota	46119	Low	High	Low	Low	NOQ3	Mod
Todd	South Dakota	46121	Low	High	Low	Low	Q3	Mod
Tripp	South Dakota	46123	Low	High	Low	Low	Q3	Mod
Turner	South Dakota	46125	Low	Mod	Mod	Mod	Q3	Mod
Union	South Dakota	46127	Low	Mod	Mod	Mod	Q3	Mod
Walworth	South Dakota	46129	Low	High	Mod	Mod	Q3	Mod
Yankton	South Dakota	46135	Low	High	Mod	Mod	Q3	Mod

County	State	FIPS	EQ	LS	Wind	Torn	Flood	Icing
Ziebach	South Dakota	46137	Low	High	Low	Low	Q3	Mod
Anderson	Tennessee	47001	Mod	High	Low	Low	NOQ3	Mod
Bedford	Tennessee	47003	Mod	Mod	Low	Low	NOQ3	Mod
Benton	Tennessee	47005	Mod	Low	Low	Low	Q3	Mod
Bledsoe	Tennessee	47007	Mod	High	Low	Low	NOQ3	Mod
Blount	Tennessee	47009	Mod	High	Low	Low	NOQ3	Mod
Bradley	Tennessee	47011	Mod	Mod	Mod	Mod	NOQ3	Mod
Campbell	Tennessee	47013	Mod	High	Low	Low	NOQ3	Mod
Cannon	Tennessee	47015	Mod	Mod	Low	Low	NOQ3	Mod
Carroll	Tennessee	47017	Mod	Low	Low	Low	Q3	High
Carter	Tennessee	47019	Mod	High	Low	Low	NOQ3	Mod
Cheatham	Tennessee	47021	Mod	Low	Low	Low	Q3	Mod
Chester	Tennessee	47023	Mod	Low	Mod	Mod	Q3	High
Claiborne	Tennessee	47025	Mod	High	Low	Low	NOQ3	Mod
Clay	Tennessee	47027	Mod	Mod	Low	Low	Q3	Mod
Cocke	Tennessee	47029	Mod	High	Low	Low	NOQ3	Mod
Coffee	Tennessee	47031	Mod	Mod	Low	Low	NOQ3	Mod
Crockett	Tennessee	47033	High	Low	Low	Low	NOQ3	High
Cumberland	Tennessee	47035	Mod	High	Low	Low	NOQ3	Mod
Davidson	Tennessee	47037	Mod	Mod	Low	Low	Q3	Mod
De Kalb	Tennessee	47041	Mod	Mod	Low	Low	Q3	Mod
Decatur	Tennessee	47039	Mod	Low	Low	Low	Q3	Mod
Dickson	Tennessee	47043	Mod	Low	Low	Low	Q3	Mod
Dyer	Tennessee	47045	High	High	Mod	Mod	Q3	High
Fayette	Tennessee	47047	High	Low	Low	Low	NOQ3	High
Fentress	Tennessee	47049	Mod	High	Low	Low	NOQ3	Mod
Franklin	Tennessee	47051	Mod	High	Low	Low	NOQ3	Mod
Gibson	Tennessee	47053	High	Low	Low	Low	Q3	High
Giles	Tennessee	47055	Mod	Mod	Low	Low	NOQ3	Mod
Grainger	Tennessee	47057	Mod	High	Low	Low	NOQ3	Mod
Greene	Tennessee	47059	Mod	High	Low	Low	NOQ3	Mod
Grundy	Tennessee	47061	Mod	High	Low	Low	Q3	Mod
Hamblen	Tennessee	47063	Mod	High	Low	Low	NOQ3	Mod
Hamilton	Tennessee	47065	Mod	High	Low	Low	Q3	Mod
Hancock	Tennessee	47067	Mod	High	Low	Low	NOQ3	Mod
Hardeman	Tennessee	47069	Mod	Low	Low	Low	Q3	High
Hardin	Tennessee	47071	Mod	Low	Low	Low	Q3	Mod
Hawkins	Tennessee	47073	Mod	High	Low	Low	NOQ3	Mod
Haywood	Tennessee	47075	High	Low	Low	Low	NOQ3	High
Henderson	Tennessee	47077	Mod	Low	Low	Low	Q3	High
Henry	Tennessee	47079	Mod	Low	Low	Low	Q3	High
Hickman	Tennessee	47081	Mod	Low	Low	Low	NOQ3	Mod
Houston	Tennessee	47083	Mod	Low	Low	Low	Q3	Mod
Humphreys	Tennessee	47085	Mod	Low	Low	Low	Q3	Mod
Jackson	Tennessee	47087	Mod	Mod	Low	Low	Q3	Mod
Jefferson	Tennessee	47089	Mod	High	Low	Low	NOQ3	Mod
Johnson	Tennessee	47091	Mod	High	Low	Low	NOQ3	Mod

County	State	FIPS	EQ	LS	Wind	Torn	Flood	Icing
Knox	Tennessee	47093	Mod	High	Low	Low	NOQ3	Mod
Lake	Tennessee	47095	High	High	Low	Low	Q3	High
Lauderdale	Tennessee	47097	High	High	Mod	Mod	Q3	High
Lawrence	Tennessee	47099	Mod	Low	Mod	Mod	NOQ3	Mod
Lewis	Tennessee	47101	Mod	Low	Low	Low	NOQ3	Mod
Lincoln	Tennessee	47103	Mod	Mod	Mod	Mod	NOQ3	Mod
Loudon	Tennessee	47105	Mod	Mod	Low	Low	NOQ3	Mod
Macon	Tennessee	47111	Mod	Low	Low	Low	NOQ3	Mod
Madison	Tennessee	47113	Mod	Low	Mod	Mod	Q3	High
Marion	Tennessee	47115	Mod	High	Low	Low	NOQ3	Mod
Marshall	Tennessee	47117	Mod	Mod	Mod	Mod	NOQ3	Mod
Maury	Tennessee	47119	Mod	Low	Low	Low	Q3	Mod
McMinn	Tennessee	47107	Mod	High	Mod	Mod	NOQ3	Mod
McNairy	Tennessee	47109	Mod	Low	Low	Low	Q3	Mod
Meigs	Tennessee	47121	Mod	High	Low	Low	NOQ3	Mod
Monroe	Tennessee	47123	Mod	High	Low	Low	NOQ3	Mod
Montgomery	Tennessee	47125	Mod	Low	Low	Low	Q3	Mod
Moore	Tennessee	47127	Mod	Low	Low	Low	NOQ3	Mod
Morgan	Tennessee	47129	Mod	High	Low	Low	NOQ3	Mod
Obion	Tennessee	47131	High	High	Low	Low	Q3	High
Overton	Tennessee	47133	Mod	High	Low	Low	NOQ3	Mod
Perry	Tennessee	47135	Mod	Low	Low	Low	NOQ3	Mod
Pickett	Tennessee	47137	Mod	High	Low	Low	NOQ3	Mod
Polk	Tennessee	47139	Mod	High	Low	Low	NOQ3	Mod
Putnam	Tennessee	47141	Mod	High	Low	Low	NOQ3	Mod
Rhea	Tennessee	47143	Mod	High	Low	Low	NOQ3	Mod
Roane	Tennessee	47145	Mod	High	Low	Low	NOQ3	Mod
Robertson	Tennessee	47147	Mod	Low	Low	Low	Q3	Mod
Rutherford	Tennessee	47149	Mod	Mod	Low	Low	Q3	Mod
Scott	Tennessee	47151	Mod	High	Low	Low	NOQ3	Mod
Sequatchie	Tennessee	47153	Mod	High	Low	Low	NOQ3	Mod
Sevier	Tennessee	47155	Mod	High	Low	Low	NOQ3	Mod
Shelby	Tennessee	47157	High	High	Mod	Mod	Q3	High
Smith	Tennessee	47159	Mod	Mod	Low	Low	NOQ3	Mod
Stewart	Tennessee	47161	Mod	Low	Low	Low	Q3	Mod
Sullivan	Tennessee	47163	Mod	High	Low	Low	NOQ3	Mod
Sumner	Tennessee	47165	Mod	Low	Mod	Mod	Q3	Mod
Tipton	Tennessee	47167	High	High	Mod	Mod	Q3	High
Trousdale	Tennessee	47169	Mod	Low	Mod	Mod	NOQ3	Mod
Unicoi	Tennessee	47171	Mod	High	Low	Low	NOQ3	Mod
Union	Tennessee	47173	Mod	High	Low	Low	NOQ3	Mod
Van Buren	Tennessee	47175	Mod	High	Low	Low	NOQ3	Mod
Warren	Tennessee	47177	Mod	High	Mod	Mod	NOQ3	Mod
Washington	Tennessee	47179	Mod	High	Low	Low	NOQ3	Mod
Wayne	Tennessee	47181	Mod	Low	Low	Low	NOQ3	Mod
Weakley	Tennessee	47183	High	Low	Mod	Mod	Q3	High
White	Tennessee	47185	Mod	High	Low	Low	NOQ3	Mod

County	State	FIPS	EQ	LS	Wind	Torn	Flood	Icing
Williamson	Tennessee	47187	Mod	Mod	Low	Low	Q3	Mod
Wilson	Tennessee	47189	Mod	Mod	Mod	Mod	NOQ3	Mod
Anderson	Texas	48001	Low	Low	Low	Low	NOQ3	Mod
Andrews	Texas	48003	Mod	Low	Low	Low	NOQ3	Mod
Angelina	Texas	48005	Low	Low	Mod	Mod	Q3	Mod
Aransas	Texas	48007	Low	Low	High	Mod	Q3	Mod
Archer	Texas	48009	Low	Low	Low	Low	Q3	Mod
Armstrong	Texas	48011	Low	Low	Mod	Mod	NOQ3	Mod
Atascosa	Texas	48013	Low	Mod	Mod	Low	NOQ3	Mod
Austin	Texas	48015	Low	Low	Mod	Mod	Q3	Mod
Bailey	Texas	48017	Low	Low	Mod	Mod	NOQ3	Mod
Bandera	Texas	48019	Low	Low	Low	Low	Q3	Mod
Bastrop	Texas	48021	Low	High	Mod	Low	Q3	Mod
Baylor	Texas	48023	Low	Low	Mod	Mod	NOQ3	Mod
Bee	Texas	48025	Low	Low	High	Mod	NOQ3	Mod
Bell	Texas	48027	Low	High	Mod	Mod	Q3	Mod
Bexar	Texas	48029	Low	High	Mod	Mod	Q3	Mod
Blanco	Texas	48031	Low	Low	Low	Low	Q3	Mod
Borden	Texas	48033	Low	Low	Low	Low	NOQ3	Mod
Bosque	Texas	48035	Low	Mod	Mod	Mod	NOQ3	Mod
Bowie	Texas	48037	Low	High	Mod	Mod	Q3	High
Brazoria	Texas	48039	Low	Low	High	Mod	Q3	Mod
Brazos	Texas	48041	Low	Low	Mod	Low	Q3	Mod
Brewster	Texas	48043	Mod	Low	Low	Low	NOQ3	Low
Briscoe	Texas	48045	Low	Low	Mod	Mod	NOQ3	Mod
Brooks	Texas	48047	Low	Low	High	Low	Q3	Low
Brown	Texas	48049	Low	Low	Mod	Mod	NOQ3	Mod
Burleson	Texas	48051	Low	Low	Mod	Low	Q3	Mod
Burnet	Texas	48053	Low	Low	Low	Low	Q3	Mod
Caldwell	Texas	48055	Low	High	Mod	Mod	NOQ3	Mod
Calhoun	Texas	48057	Low	Low	High	Mod	Q3	Mod
Callahan	Texas	48059	Low	Low	Mod	Mod	NOQ3	Mod
Cameron	Texas	48061	Low	Low	High	Mod	Q3	Low
Camp	Texas	48063	Low	Low	Mod	Mod	NOQ3	Mod
Carson	Texas	48065	Low	Low	Mod	Mod	NOQ3	Mod
Cass	Texas	48067	Low	Low	Mod	Mod	NOQ3	Mod
Castro	Texas	48069	Low	Low	Mod	Mod	NOQ3	Mod
Chambers	Texas	48071	Low	Low	High	Mod	Q3	Mod
Cherokee	Texas	48073	Low	Low	Low	Low	NOQ3	Mod
Childress	Texas	48075	Low	Low	Mod	Mod	NOQ3	Mod
Clay	Texas	48077	Mod	Low	Low	Low	NOQ3	Mod
Cochran	Texas	48079	Low	Low	Mod	Mod	NOQ3	Mod
Coke	Texas	48081	Low	Low	Low	Low	NOQ3	Mod
Coleman	Texas	48083	Low	Low	Low	Low	NOQ3	Mod
Collin	Texas	48085	Low	High	Mod	Mod	Q3	Mod
Collingsworth	Texas	48087	Low	Low	Mod	Mod	NOQ3	Mod
Colorado	Texas	48089	Low	Low	Mod	Mod	NOQ3	Mod

County	State	FIPS	EQ	LS	Wind	Torn	Flood	Icing
Comal	Texas	48091	Low	High	Mod	Low	Q3	Mod
Comanche	Texas	48093	Low	Low	Mod	Mod	NOQ3	Mod
Concho	Texas	48095	Low	Low	Low	Low	NOQ3	Mod
Cooke	Texas	48097	Low	Mod	Mod	Mod	NOQ3	Mod
Coryell	Texas	48099	Low	Mod	Low	Low	NOQ3	Mod
Cottle	Texas	48101	Low	Low	Low	Low	NOQ3	Mod
Crane	Texas	48103	Mod	Low	Low	Low	NOQ3	Mod
Crockett	Texas	48105	Low	Low	Low	Low	NOQ3	Mod
Crosby	Texas	48107	Low	Low	Mod	Mod	NOQ3	Mod
Culberson	Texas	48109	Mod	Mod	Low	Low	NOQ3	Low
Dallam	Texas	48111	Low	Low	Low	Low	NOQ3	Mod
Dallas	Texas	48113	Low	High	Mod	Mod	Q3	Mod
Dawson	Texas	48115	Low	Low	Mod	Mod	NOQ3	Mod
De Witt	Texas	48123	Low	Low	Mod	Low	NOQ3	Mod
Deaf Smith	Texas	48117	Low	Mod	Low	Low	NOQ3	Mod
Delta	Texas	48119	Low	High	Low	Low	NOQ3	Mod
Denton	Texas	48121	Low	Mod	Mod	Mod	Q3	Mod
Dickens	Texas	48125	Low	Low	Low	Low	NOQ3	Mod
Dimmit	Texas	48127	Low	Low	Low	Low	NOQ3	Low
Donley	Texas	48129	Low	Low	Mod	Mod	NOQ3	Mod
Duval	Texas	48131	Low	Low	Mod	Low	NOQ3	Low
Eastland	Texas	48133	Low	Low	Mod	Mod	Q3	Mod
Ector	Texas	48135	Mod	Low	Mod	Mod	NOQ3	Mod
Edwards	Texas	48137	Low	Low	Low	Low	Q3	Mod
El Paso	Texas	48141	Mod	Low	Low	Low	Q3	Low
Ellis	Texas	48139	Low	High	Mod	Mod	NOQ3	Mod
Erath	Texas	48143	Low	Low	Mod	Mod	NOQ3	Mod
Falls	Texas	48145	Low	High	Low	Low	NOQ3	Mod
Fannin	Texas	48147	Low	High	Mod	Mod	NOQ3	Mod
Fayette	Texas	48149	Low	Mod	Mod	Low	Q3	Mod
Fisher	Texas	48151	Low	Low	Mod	Mod	NOQ3	Mod
Floyd	Texas	48153	Low	Low	Mod	Mod	NOQ3	Mod
Foard	Texas	48155	Low	Low	Low	Low	NOQ3	Mod
Fort Bend	Texas	48157	Low	Low	High	Mod	Q3	Mod
Franklin	Texas	48159	Low	High	Mod	Mod	NOQ3	Mod
Freestone	Texas	48161	Low	Low	Low	Low	NOQ3	Mod
Frio	Texas	48163	Low	Low	Mod	Low	NOQ3	Mod
Gaines	Texas	48165	Mod	Low	Low	Low	NOQ3	Mod
Galveston	Texas	48167	Low	Low	High	Hig	h Q3	Mod
Garza	Texas	48169	Low	Low	Low	Low	NOQ3	Mod
Gillespie	Texas	48171	Low	Low	Low	Low	NOQ3	Mod
Glasscock	Texas	48173	Low	Low	Low	Low	NOQ3	Mod
Goliad	Texas	48175	Low	Low	High	Low	NOQ3	Mod
Gonzales	Texas	48177	Low	Mod	Mod	Low	NOQ3	Mod
Gray	Texas	48179	Low	Low	Mod	Mod	NOQ3	Mod
Grayson	Texas	48181	Low	Mod	Mod	Mod	Q3	Mod
Gregg	Texas	48183	Low	Low	Mod	Mod	NOQ3	Mod

County	State	FIPS	EQ	LS	Wind	Torn	Flood	Icing
Grimes	Texas	48185	Low	Low	Mod	Low	Q3	Mod
Guadalupe	Texas	48187	Low	High	Mod	Low	Q3	Mod
Hale	Texas	48189	Low	Low	Mod	Mod	NOQ3	Mod
Hall	Texas	48191	Low	Low	Mod	Mod	NOQ3	Mod
Hamilton	Texas	48193	Low	Low	Low	Low	NOQ3	Mod
Hansford	Texas	48195	Low	Low	Mod	Mod	NOQ3	Mod
Hardeman	Texas	48197	Low	Low	Mod	Mod	NOQ3	Mod
Hardin	Texas	48199	Low	Low	Mod	Low	Q3	Mod
Harris	Texas	48201	Low	Mod	High	Mod	NOQ3	Mod
Harrison	Texas	48203	Low	Low	Mod	Mod	NOQ3	Mod
Hartley	Texas	48205	Low	Low	Low	Low	NOQ3	Mod
Haskell	Texas	48207	Low	Low	Mod	Mod	NOQ3	Mod
Hays	Texas	48209	Low	High	Mod	Low	Q3	Mod
Hemphill	Texas	48211	Low	Low	Mod	Mod	NOQ3	Mod
Henderson	Texas	48213	Low	High	Mod	Mod	NOQ3	Mod
Hidalgo	Texas	48215	Low	Low	High	Low	Q3	Low
Hill	Texas	48217	Low	High	Mod	Mod	NOQ3	Mod
Hockley	Texas	48219	Low	Low	Mod	Mod	NOQ3	Mod
Hood	Texas	48221	Low	Low	Mod	Mod	NOQ3	Mod
Hopkins	Texas	48223	Low	High	Mod	Mod	NOQ3	Mod
Houston	Texas	48225	Low	Low	Low	Low	Q3	Mod
Howard	Texas	48227	Low	Low	Mod	Mod	NOQ3	Mod
Hudspeth	Texas	48229	Mod	High	Low	Low	NOQ3	Low
Hunt	Texas	48231	Low	High	Mod	Mod	NOQ3	Mod
Hutchinson	Texas	48233	Low	Low	Mod	Mod	NOQ3	Mod
Irion	Texas	48235	Low	Low	Low	Low	NOQ3	Mod
Jack	Texas	48237	Low	Low	Low	Low	NOQ3	Mod
Jackson	Texas	48239	Low	Low	High	Mod	Q3	Mod
Jasper	Texas	48241	Low	Low	Mod	Low	Q3	Mod
Jeff Davis	Texas	48243	Mod	Mod	Low	Low	NOQ3	Low
Jefferson	Texas	48245	Low	Mod	High	Mod	Q3	Mod
Jim Hogg	Texas	48247	Low	Low	Mod	Low	NOQ3	Low
Jim Wells	Texas	48249	Low	Low	High	Mod	NOQ3	Low
Johnson	Texas	48251	Low	Mod	Mod	Mod	Q3	Mod
Jones	Texas	48253	Low	Low	Mod	Mod	NOQ3	Mod
Karnes	Texas	48255	Low	Low	Mod	Mod	NOQ3	Mod
Kaufman	Texas	48257	Low	High	Mod	Mod	NOQ3	Mod
Kendall	Texas	48259	Low	Low	Low	Low	Q3	Mod
Kenedy	Texas	48261	Low	Low	High	Low	Q3	Low
Kent	Texas	48263	Low	Low	Low	Low	NOQ3	Mod
Kerr	Texas	48265	Low	Low	Low	Low	Q3	Mod
Kimble	Texas	48267	Low	Low	Low	Low	NOQ3	Mod
King	Texas	48269	Low	Low	Low	Low	NOQ3	Mod
Kinney	Texas	48271	Low	Low	Low	Low	NOQ3	Mod
Kleberg	Texas	48273	Low	Low	High	Low	Q3	Low
Knox	Texas	48275	Low	Low	Mod	Mod	NOQ3	Mod
La Salle	Texas	48283	Low	Low	Mod	Low	NOQ3	Mod

County	State	FIPS	EQ	LS	Wind	Torn	Flood	Icing
Lamar	Texas	48277	Low	High	Mod	Mod	NOQ3	High
Lamb	Texas	48279	Low	Low	Mod	Mod	NOQ3	Mod
Lampasas	Texas	48281	Low	Low	Low	Low	NOQ3	Mod
Lavaca	Texas	48285	Low	Low	Mod	Low	NOQ3	Mod
Lee	Texas	48287	Low	Low	Mod	Mod	Q3	Mod
Leon	Texas	48289	Low	Low	Low	Low	NOQ3	Mod
Liberty	Texas	48291	Low	Low	High	Mod	Q3	Mod
Limestone	Texas	48293	Low	High	Low	Low	NOQ3	Mod
Lipscomb	Texas	48295	Low	Low	Low	Low	NOQ3	Mod
Live Oak	Texas	48297	Low	Low	Mod	Low	NOQ3	Mod
Llano	Texas	48299	Low	Low	Low	Low	Q3	Mod
Loving	Texas	48301	Mod	Low	Low	Low	NOQ3	Low
Lubbock	Texas	48303	Low	Low	Mod	Mod	Q3	Mod
Lynn	Texas	48305	Low	Low	Mod	Mod	NOQ3	Mod
Madison	Texas	48313	Low	Low	Mod	Low	Q3	Mod
Marion	Texas	48315	Low	Low	Mod	Mod	NOQ3	Mod
Martin	Texas	48317	Low	Low	Mod	Mod	NOQ3	Mod
Mason	Texas	48319	Low	Low	Low	Low	Q3	Mod
Matagorda	Texas	48321	Low	Low	High	Mod	Q3	Mod
Maverick	Texas	48323	Low	Low	Low	Low	NOQ3	Low
McCulloch	Texas	48307	Low	Low	Low	Low	NOQ3	Mod
McLennan	Texas	48309	Low	High	Mod	Mod	Q3	Mod
McMullen	Texas	48311	Low	Low	Mod	Low	NOQ3	Mod
Medina	Texas	48325	Low	High	Low	Low	Q3	Mod
Menard	Texas	48327	Low	Low	Low	Low	NOQ3	Mod
Midland	Texas	48329	Low	Low	Mod	Mod	NOQ3	Mod
Milam	Texas	48331	Low	High	Low	Low	NOQ3	Mod
Mills	Texas	48333	Low	Low	Low	Low	NOQ3	Mod
Mitchell	Texas	48335	Low	Low	Mod	Mod	NOQ3	Mod
Montague	Texas	48337	Low	Low	Mod	Mod	NOQ3	Mod
Montgomery	Texas	48339	Low	Low	Mod	Mod	Q3	Mod
Moore	Texas	48341	Low	Low	Mod	Mod	NOQ3	Mod
Morris	Texas	48343	Low	Low	Mod	Mod	NOQ3	Mod
Motley	Texas	48345	Low	Low	Low	Low	NOQ3	Mod
Nacogdoches	Texas	48347	Low	Low	Mod	Mod	Q3	Mod
Navarro	Texas	48349	Low	High	Mod	Mod	NOQ3	Mod
Newton	Texas	48351	Low	Low	Mod	Low	NOQ3	Mod
Nolan	Texas	48353	Low	Low	Mod	Mod	NOQ3	Mod
Nueces	Texas	48355	Low	Low	High	Mod	Q3	Low
Ochiltree	Texas	48357	Low	Low	Mod	Mod	NOQ3	Mod
Oldham	Texas	48359	Low	Low	Low	Low	NOQ3	Mod
Orange	Texas	48361	Low	Mod	High	Mod	Q3	Mod
Palo Pinto	Texas	48363	Low	Low	Mod	Mod	NOQ3	Mod
Panola	Texas	48365	Low	Low	Mod	Mod	NOQ3	Mod
Parker	Texas	48367	Low	Low	Mod	Mod	NOQ3	Mod
Parmer	Texas	48369	Low	Low	Mod	Mod	NOQ3	Mod
Pecos	Texas	48371	Mod	Low	Low	Low	NOQ3	Low

County	State	FIPS	EQ	LS	Wind	Torn	Flood	Icing
Polk	Texas	48373	Low	Low	Mod	Low	Q3	Mod
Potter	Texas	48375	Low	Low	Mod	Mod	Q3	Mod
Presidio	Texas	48377	Mod	Low	Low	Low	NOQ3	Low
Rains	Texas	48379	Low	Low	Mod	Mod	NOQ3	Mod
Randall	Texas	48381	Low	Low	Mod	Mod	NOQ3	Mod
Reagan	Texas	48383	Low	Low	Low	Low	NOQ3	Mod
Real	Texas	48385	Low	Low	Low	Low	Q3	Mod
Red River	Texas	48387	Low	High	Low	Low	NOQ3	High
Reeves	Texas	48389	Mod	Low	Low	Low	NOQ3	Low
Refugio	Texas	48391	Low	Low	High	Low	NOQ3	Mod
Roberts	Texas	48393	Low	Low	Low	Low	NOQ3	Mod
Robertson	Texas	48395	Low	Low	Low	Low	NOQ3	Mod
Rockwall	Texas	48397	Low	High	Mod	Mod	NOQ3	Mod
Runnels	Texas	48399	Low	Low	Mod	Mod	NOQ3	Mod
Rusk	Texas	48401	Low	Low	Mod	Mod	NOQ3	Mod
Sabine	Texas	48403	Low	Low	Mod	Low	NOQ3	Mod
San Augustine	Texas	48405	Low	Low	Mod	Low	Q3	Mod
San Jacinto	Texas	48407	Low	Low	Mod	Low	Q3	Mod
San Patricio	Texas	48409	Low	Low	High	Mod	Q3	Low
San Saba	Texas	48411	Low	Low	Low	Low	NOQ3	Mod
Schleicher	Texas	48413	Low	Low	Low	Low	NOQ3	Mod
Scurry	Texas	48415	Low	Low	Mod	Mod	NOQ3	Mod
Shackelford	Texas	48417	Low	Low	Low	Low	NOQ3	Mod
Shelby	Texas	48419	Low	Low	Mod	Mod	Q3	Mod
Sherman	Texas	48421	Low	Low	Mod	Mod	NOQ3	Mod
Smith	Texas	48423	Low	Low	Mod	Mod	NOQ3	Mod
Somervell	Texas	48425	Low	Low	Low	Low	NOQ3	Mod
Starr	Texas	48427	Low	Low	Mod	Low	NOQ3	Low
Stephens	Texas	48429	Low	Low	Low	Low	NOQ3	Mod
Sterling	Texas	48431	Low	Low	Low	Low	NOQ3	Mod
Stonewall	Texas	48433	Low	Low	Low	Low	NOQ3	Mod
Sutton	Texas	48435	Low	Low	Low	Low	NOQ3	Mod
Swisher	Texas	48437	Low	Low	Mod	Mod	NOQ3	Mod
Tarrant	Texas	48439	Low	Mod	Mod	Mod	Q3	Mod
Taylor	Texas	48441	Low	Low	Mod	Mod	NOQ3	Mod
Terrell	Texas	48443	Low	Low	Low	Low	NOQ3	Low
Terry	Texas	48445	Low	Low	Mod	Mod	NOQ3	Mod
Throckmorton	Texas	48447	Low	Low	Mod	Mod	NOQ3	Mod
Titus	Texas	48449	Low	Low	Mod	Mod	NOQ3	Mod
Tom Green	Texas	48451	Low	Low	Low	Low	NOQ3	Mod
Travis	Texas	48453	Low	High	Mod	Mod	Q3	Mod
Trinity	Texas	48455	Low	Low	Mod	Low	Q3	Mod
Tyler	Texas	48457	Low	Low	Mod	Low	NOQ3	Mod
Upshur	Texas	48459	Low	Low	Mod	Mod	NOQ3	Mod
Upton	Texas	48461	Low	Low	Low	Low	NOQ3	Mod
Uvalde	Texas	48463	Low	Low	Low	Low	Q3	Mod
Val Verde	Texas	48465	Low	Low	Low	Low	NOQ3	Mod

County	State	FIPS	EQ	LS	Wind	Torn	Flood	Icing
Van Zandt	Texas	48467	Low	Low	Low	Low	NOQ3	Mod
Victoria	Texas	48469	Low	Low	High	Mod	Q3	Mod
Walker	Texas	48471	Low	Low	Mod	Low	Q3	Mod
Waller	Texas	48473	Low	Low	Mod	Mod	Q3	Mod
Ward	Texas	48475	Mod	Low	Low	Low	NOQ3	Low
Washington	Texas	48477	Low	Low	Mod	Mod	Q3	Mod
Webb	Texas	48479	Low	Low	Mod	Low	Q3	Low
Wharton	Texas	48481	Low	Low	High	Mod	Q3	Mod
Wheeler	Texas	48483	Low	Low	Mod	Mod	NOQ3	Mod
Wichita	Texas	48485	Low	Low	Mod	Mod	Q3	Mod
Wilbarger	Texas	48487	Low	Low	Mod	Mod	NOQ3	Mod
Willacy	Texas	48489	Low	Low	High	Low	Q3	Low
Williamson	Texas	48491	Low	High	Mod	Mod	NOQ3	Mod
Wilson	Texas	48493	Low	Mod	Mod	Low	NOQ3	Mod
Winkler	Texas	48495	Mod	Low	Low	Low	NOQ3	Low
Wise	Texas	48497	Low	Low	Mod	Mod	NOQ3	Mod
Wood	Texas	48499	Low	Low	Mod	Mod	NOQ3	Mod
Yoakum	Texas	48501	Low	Low	Low	Low	NOQ3	Mod
Young	Texas	48503	Low	Low	Mod	Mod	NOQ3	Mod
Zapata	Texas	48505	Low	Low	Mod	Low	NOQ3	Low
Zavala	Texas	48507	Low	Low	Low	Low	NOQ3	Mod
Beaver	Utah	49001	Mod	High	Low	Low	NOQ3	Low
Box Elder	Utah	49003	High	High	Low	Low	NOQ3	Low
Cache	Utah	49005	High	High	Low	Low	NOQ3	Low
Carbon	Utah	49007	Mod	Low	Low	Low	NOQ3	Low
Daggett	Utah	49009	Mod	High	Low	Low	NOQ3	Low
Davis	Utah	49011	High	High	Low	Low	NOQ3	Low
Duchesne	Utah	49013	Mod	High	Low	Low	NOQ3	Low
Emery	Utah	49015	Mod	High	Low	Low	NOQ3	Low
Garfield	Utah	49017	Mod	High	Low	Low	NOQ3	Low
Grand	Utah	49019	Mod	High	Low	Low	NOQ3	Low
Iron	Utah	49021	Mod	High	Low	Low	NOQ3	Low
Juab	Utah	49023	Mod	High	Low	Low	NOQ3	Low
Kane	Utah	49025	Mod	High	Low	Low	NOQ3	Low
Millard	Utah	49027	Mod	High	Low	Low	NOQ3	Low
Morgan	Utah	49029	High	High	Low	Low	NOQ3	Low
Piute	Utah	49031	Mod	High	Low	Low	NOQ3	Low
Rich	Utah	49033	Mod	High	Low	Low	NOQ3	Low
Salt Lake	Utah	49035	High	High	Low	Low	Q3	Low
San Juan	Utah	49037	Mod	High	Low	Low	NOQ3	Low
Sanpete	Utah	49039	Mod	High	Low	Low	NOQ3	Low
Sevier	Utah	49041	Mod	High	Low	Low	NOQ3	Low
Summit	Utah	49043	High	High	Low	Low	NOQ3	Low
Tooele	Utah	49045	Mod	Low	Low	Low	NOQ3	Low
Uintah	Utah	49047	Mod	High	Low	Low	NOQ3	Low
Utah	Utah	49049	High	High	Low	Low	Q3	Low
Wasatch	Utah	49051	Mod	High	Low	Low	NOQ3	Low

County	State	FIPS	EQ	LS	Wind	Torn	Flood	Icing
Washington	Utah	49053	Mod	Mod	Low	Low	NOQ3	Low
Wayne	Utah	49055	Mod	High	Low	Low	NOQ3	Low
Weber	Utah	49057	High	High	Low	Low	NOQ3	Low
Addison	Vermont	50001	Mod	High	Low	Low	NOQ3	Mod
Bennington	Vermont	50003	Mod	High	Low	Low	NOQ3	Mod
Caledonia	Vermont	50005	Mod	High	Low	Low	NOQ3	Mod
Chittenden	Vermont	50007	Mod	High	Low	Low	NOQ3	High
Essex	Vermont	50009	Mod	Low	Low	Low	NOQ3	Mod
Franklin	Vermont	50011	Mod	High	Low	Low	NOQ3	High
Grand Isle	Vermont	50013	Mod	High	Low	Low	NOQ3	High
Lamoille	Vermont	50015	Mod	High	Low	Low	NOQ3	Mod
Orange	Vermont	50017	Mod	High	Low	Low	NOQ3	Mod
Orleans	Vermont	50019	Mod	High	Low	Low	NOQ3	Mod
Rutland	Vermont	50021	Mod	High	Low	Low	Q3	Mod
Washington	Vermont	50023	Mod	High	Low	Low	Q3	Mod
Windham	Vermont	50025	Mod	High	Low	Low	Q3	High
Windsor	Vermont	50027	Mod	High	Low	Low	Q3	Mod
Accomack	Virginia	51001	Low	Low	High	Low	Q3	Mod
Albemarle	Virginia	51003	Mod	High	Low	Low	Q3	Mod
Alexandria	Virginia	51510	Low	High	Low	Low	Q3	Mod
Alleghany	Virginia	51005	Mod	High	Low	Low	NOQ3	Mod
Amelia	Virginia	51007	Mod	Low	Low	Low	NOQ3	Mod
Amherst	Virginia	51009	Mod	High	Low	Low	NOQ3	Mod
Appomattox	Virginia	51011	Mod	High	Low	Low	NOQ3	Mod
Arlington	Virginia	51013	Low	High	Low	Low	NOQ3	Mod
Augusta	Virginia	51015	Mod	High	Low	Low	Q3	Mod
Bath	Virginia	51017	Mod	High	Low	Low	Q3	Mod
Bedford	Virginia	51019	Mod	High	Low	Low	Q3	Mod
Bedford City	Virginia	51515	Mod	High	Low	Low	Q3	Mod
Bland	Virginia	51021	Mod	Mod	Low	Low	NOQ3	Mod
Botetourt	Virginia	51023	Mod	High	Low	Low	Q3	Mod
Bristol	Virginia	51520	Mod	High	Mod	Mod	NOQ3	Mod
Brunswick	Virginia	51025	Mod	Low	Low	Low	Q3	Mod
Buchanan	Virginia	51027	Mod	High	Low	Low	Q3	Mod
Buckingham	Virginia	51029	Mod	High	Low	Low	NOQ3	Mod
Buena Vista	Virginia	51530	Mod	High	Low	Low	Q3	Mod
Campbell	Virginia	51031	Mod	High	Low	Low	Q3	Mod
Carolinae	Virginia	51033	Mod	High	Low	Low	NOQ3	Mod
Carroll	Virginia	51035	Mod	High	Low	Low	NOQ3	Mod
Charles City	Virginia	51036	Mod	High	Low	Low	NOQ3	Mod
Charlotte	Virginia	51037	Mod	Low	Low	Low	NOQ3	Mod
Charlottesville	Virginia	51540	Mod	High	Low	Low	Q3	Mod
Chesapeake	Virginia	51550	Low	Low	High	Low	NOQ3	Mod
Chesterfield	Virginia	51041	Mod	High	Mod	Mod	NOQ3	Mod
Clarke	Virginia	51043	Low	High	Low	Low	NOQ3	Mod
Clifton Forge	Virginia	51560	Mod	High	Low	Low	NOQ3	Mod
Colonial Heights	Virginia	51570	Mod	High	Low	Low	NOQ3	Mod

County	State	FIPS	EQ	LS	Wind	Torn	Flood	Icing
Covington	Virginia	51580	Mod	High	Low	Low	NOQ3	Mod
Craig	Virginia	51045	Mod	High	Low	Low	NOQ3	Mod
Culpeper	Virginia	51047	Mod	High	Low	Low	Q3	Mod
Cumberland	Virginia	51049	Mod	Low	Low	Low	NOQ3	Mod
Danville	Virginia	51590	Low	Mod	Low	Low	Q3	Mod
Dickenson	Virginia	51051	Mod	High	Low	Low	NOQ3	Mod
Dinwiddie	Virginia	51053	Mod	Low	Low	Low	NOQ3	Mod
Emporia	Virginia	51595	Low	Low	High	Hig	h NOQ	Mod
Essex	Virginia	51057	Low	Mod	Low	Low	NOQ3	Mod
Fairfax	Virginia	51059	Low	High	Mod	Mod	NOQ3	Mod
Fairfax City	Virginia	51600	Low	Low	Low	Low	Q3	Mod
Falls Church	Virginia	51610	Low	Low	High	Hig	h NOQ	Mod
Fauquier	Virginia	51061	Mod	High	Low	Low	NOQ3	Mod
Floyd	Virginia	51063	Mod	High	Low	Low	NOQ3	Mod
Fluvanna	Virginia	51065	Mod	High	Low	Low	Q3	Mod
Franklin	Virginia	51067	Mod	High	Low	Low	NOQ3	Mod
Franklin City	Virginia	51620	Low	Low	High	Hig	h NOQ	Mod
Frederick	Virginia	51069	Low	High	Low	Low	NOQ3	Mod
Fredericksburg	Virginia	51630	Mod	High	Low	Low	NOQ3	Mod
Galax	Virginia	51640	Mod	High	Low	Low	NOQ3	Mod
Giles	Virginia	51071	Mod	High	Low	Low	Q3	Mod
Gloucester	Virginia	51073	Low	Mod	Mod	Low	Q3	Mod
Goochland	Virginia	51075	Mod	Low	Low	Low	NOQ3	Mod
Grayson	Virginia	51077	Mod	High	Low	Low	NOQ3	Mod
Greene	Virginia	51079	Mod	High	Low	Low	Q3	Mod
Greensville	Virginia	51081	Low	Low	Mod	Low	NOQ3	Mod
Halifax	Virginia	51083	Mod	High	Low	Low	Q3	Mod
Hampton	Virginia	51650	Low	Mod	High	Low	Q3	Mod
Hanover	Virginia	51085	Mod	High	Low	Low	NOQ3	Mod
Harrisonburg	Virginia	51660	Mod	High	Low	Low	Q3	Mod
Henrico	Virginia	51087	Mod	High	Low	Low	NOQ3	Mod
Henry	Virginia	51089	Mod	High	Low	Low	NOQ3	Mod
Highland	Virginia	51091	Low	High	Low	Low	NOQ3	Mod
Hopewell	Virginia	51670	Mod	High	Mod	Mod	NOQ3	Mod
Isle of Wight	Virginia	51093	Low	Mod	Mod	Low	NOQ3	Mod
James City	Virginia	51095	Low	Mod	Mod	Low	NOQ3	Mod
King and Queen	Virginia	51097	Mod	Low	Mod	Low	NOQ3	Mod
King George	Virginia	51099	Low	High	Low	Low	NOQ3	Mod
King William	Virginia	51101	Mod	High	Low	Low	NOQ3	Mod
Lancaster	Virginia	51103	Low	Mod	Mod	Low	Q3	Mod
Lee	Virginia	51105	Mod	High	Low	Low	NOQ3	Mod
Lexington	Virginia	51678	Mod	Low	Low	Low	Q3	Mod
Loudoun	Virginia	51107	Low	High	Low	Low	NOQ3	Mod
Louisa	Virginia	51109	Mod	Low	Low	Low	NOQ3	Mod
Lunenburg	Virginia	51111	Mod	Low	Low	Low	NOQ3	Mod
Lynchburg	Virginia	51680	Mod	High	Low	Low	Q3	Mod
Madison	Virginia	51113	Mod	High	Low	Low	Q3	Mod

County	State	FIPS	EQ	LS	Wind	Torn	Flood	Icing
Manassas City	Virginia	51683	Low	Low	Low	Low	Q3	Mod
Manassas Park City	Virginia	51685	Low	Low	Low	Low	Q3	Mod
Martinsville	Virginia	51690	Mod	High	Low	Low	NOQ3	Mod
Mathews	Virginia	51115	Low	Low	High	Low	Q3	Mod
Mecklenburg	Virginia	51117	Mod	Mod	Low	Low	NOQ3	Mod
Middlesex	Virginia	51119	Low	Mod	Mod	Low	Q3	Mod
Montgomery	Virginia	51121	Mod	High	Low	Low	NOQ3	Mod
Nelson	Virginia	51125	Mod	High	Low	Low	NOQ3	Mod
New Kent	Virginia	51127	Mod	Mod	Low	Low	NOQ3	Mod
Newport News	Virginia	51700	Low	Mod	Mod	Mod	Q3	Mod
Norfolk	Virginia	51710	Low	Low	High	Hig	h Q3	Mod
Northampton	Virginia	51131	Low	Low	High	Mod	Q3	Mod
Northumberland	Virginia	51133	Low	Mod	Mod	Low	Q3	Mod
Norton	Virginia	51720	Mod	High	Low	Low	Q3	Mod
Nottoway	Virginia	51135	Mod	Low	Low	Low	NOQ3	Mod
Orange	Virginia	51137	Mod	High	Low	Low	Q3	Mod
Page	Virginia	51139	Mod	High	Low	Low	NOQ3	Mod
Patrick	Virginia	51141	Mod	High	Low	Low	NOQ3	Mod
Petersburg	Virginia	51730	Mod	High	High	Hig	h NOQ	Mod
Pittsylvania	Virginia	51143	Mod	High	Low	Low	Q3	Mod
Poquoson City	Virginia	51735	Low	Low	High	Low	Q3	Mod
Portsmouth	Virginia	51740	Low	Low	High	Mod	Q3	Mod
Powhatan	Virginia	51145	Mod	Low	Low	Low	NOQ3	Mod
Prince Edward	Virginia	51147	Mod	High	Low	Low	NOQ3	Mod
Prince George	Virginia	51149	Mod	High	Low	Low	NOQ3	Mod
Prince William	Virginia	51153	Low	High	Low	Low	Q3	Mod
Pulaski	Virginia	51155	Mod	High	Low	Low	NOQ3	Mod
Radford	Virginia	51750	Mod	Mod	Low	Low	NOQ3	Mod
Rappahannock	Virginia	51157	Mod	High	Low	Low	Q3	Mod
Richmond	Virginia	51159	Low	Mod	Mod	Low	Q3	Mod
Richmond City	Virginia	51760	Mod	High	Mod	Mod	NOQ3	Mod
Roanoke	Virginia	51161	Mod	High	Low	Low	Q3	Mod
Roanoke City	Virginia	51770	Mod	High	Mod	Mod	Q3	Mod
Rockbridge	Virginia	51163	Mod	High	Low	Low	Q3	Mod
Rockingham	Virginia	51165	Mod	High	Low	Low	Q3	Mod
Russell	Virginia	51167	Mod	High	Low	Low	NOQ3	Mod
Salem	Virginia	51775	Mod	Mod	Low	Low	Q3	Mod
Scott	Virginia	51169	Mod	High	Low	Low	NOQ3	Mod
Shenandoah	Virginia	51171	Mod	High	Low	Low	NOQ3	Mod
Smyth	Virginia	51173	Mod	High	Low	Low	NOQ3	Mod
South Boston	Virginia	51780	Low	Mod	High	Hig	h Q3	Mod
Southampton	Virginia	51175	Low	Low	Mod	Low	NOQ3	Mod
Spotsylvania	Virginia	51177	Mod	High	Low	Low	NOQ3	Mod
Stafford	Virginia	51179	Mod	High	Low	Low	NOQ3	Mod
Staunton	Virginia	51790	Mod	Low	Low	Low	Q3	Mod
Suffolk	Virginia	51800	Low	Mod	Mod	Low	NOQ3	Mod
Surry	Virginia	51181	Low	Mod	Mod	Low	NOQ3	Mod

County	State	FIPS	EQ	LS	Wind	Torn	Flood	Icing
Sussex	Virginia	51183	Low	High	Mod	Low	NOQ3	Mod
Tazewell	Virginia	51185	Mod	High	Low	Low	NOQ3	Mod
Virginia Beach	Virginia	51810	Low	Low	High	Mod	Q3	Mod
Warren	Virginia	51187	Low	High	Low	Low	Q3	Mod
Washington	Virginia	51191	Mod	High	Low	Low	NOQ3	Mod
Waynesboro	Virginia	51820	Mod	High	Low	Low	Q3	Mod
Westmoreland	Virginia	51193	Low	Mod	Low	Low	Q3	Mod
Williamsburg	Virginia	51830	Low	Low	Mod	Low	NOQ3	Mod
Winchester	Virginia	51840	Low	Mod	Low	Low	NOQ3	Mod
Wise	Virginia	51195	Mod	High	Low	Low	Q3	Mod
Wythe	Virginia	51197	Mod	High	Low	Low	NOQ3	Mod
York	Virginia	51199	Low	Mod	High	Low	Q3	Mod
Adams	Washington	53001	Mod	Mod	Low	Low	Q3	Low
Asotin	Washington	53003	Mod	High	Low	Low	Q3	Low
Benton	Washington	53005	Mod	High	Low	Low	Q3	Low
Chelan	Washington	53007	Mod	High	Low	Low	Q3	Low
Clallam	Washington	53009	High	High	Low	Low	Q3	Low
Clark	Washington	53011	Mod	High	Low	Low	Q3	High
Columbia	Washington	53013	Mod	High	Low	Low	Q3	Low
Cowlitz	Washington	53015	Mod	High	Low	Low	Q3	Mod
Douglas	Washington	53017	Mod	High	Low	Low	Q3	Low
Ferry	Washington	53019	Mod	High	Low	Low	Q3	Low
Franklin	Washington	53021	Mod	High	Low	Low	Q3	Low
Garfield	Washington	53023	Mod	High	Low	Low	Q3	Low
Grant	Washington	53025	Mod	High	Low	Low	Q3	Low
Grays Harbor	Washington	53027	High	High	Low	Low	Q3	Low
Island	Washington	53029	High	High	Low	Low	Q3	Low
Jefferson	Washington	53031	High	High	Low	Low	Q3	Low
King	Washington	53033	High	High	Low	Low	Q3	Low
Kitsap	Washington	53035	High	High	Low	Low	Q3	Low
Kittitas	Washington	53037	Mod	High	Low	Low	Q3	Low
Klickitat	Washington	53039	Mod	High	Low	Low	Q3	Mod
Lewis	Washington	53041	Mod	High	Low	Low	Q3	Low
Lincoln	Washington	53043	Mod	High	Low	Low	Q3	Low
Mason	Washington	53045	Mod	High	Low	Low	Q3	Low
Okanogan	Washington	53047	Mod	High	Low	Low	Q3	Low
Pacific	Washington	53049	High	High	Low	Low	Q3	Low
Pend Oreille	Washington	53051	Mod	Low	Low	Low	Q3	Low
Pierce	Washington	53053	Mod	High	Low	Low	Q3	Low
San Juan	Washington	53055	Mod	Low	Low	Low	Q3	Low
Skagit	Washington	53057	Mod	Mod	Low	Low	Q3	Low
Skamania	Washington	53059	Mod	High	Low	Low	Q3	High
Snohomish	Washington	53061	High	High	Low	Low	Q3	Low
Spokane	Washington	53063	Mod	High	Low	Low	Q3	Low
Stevens	Washington	53065	Mod	High	Low	Low	Q3	Low
Thurston	Washington	53067	Mod	High	Low	Low	Q3	Low
Wahkiakum	Washington	53069	Mod	High	Low	Low	Q3	Low

County	State	FIPS	EQ	LS	Wind	Torn	Flood	Icing
Walla Walla	Washington	53071	Mod	Low	Low	Low	Q3	Low
Whatcom	Washington	53073	Mod	High	Low	Low	Q3	Mod
Whitman	Washington	53075	Mod	Low	Low	Low	Q3	Low
Yakima	Washington	53077	Mod	High	Low	Low	Q3	Low
Barbour	West Virginia	54001	Low	High	Low	Low	Q3	Mod
Berkeley	West Virginia	54003	Low	High	Low	Low	NOQ3	Mod
Boone	West Virginia	54005	Mod	High	Low	Low	NOQ3	Mod
Braxton	West Virginia	54007	Low	High	Low	Low	Q3	Mod
Brooke	West Virginia	54009	Low	High	Low	Low	Q3	Mod
Cabell	West Virginia	54011	Low	High	Low	Low	Q3	Mod
Calhoun	West Virginia	54013	Low	High	Low	Low	Q3	Mod
Clay	West Virginia	54015	Low	High	Low	Low	Q3	Mod
Doddridge	West Virginia	54017	Low	High	Low	Low	NOQ3	Mod
Fayette	West Virginia	54019	Mod	High	Low	Low	Q3	Mod
Gilmer	West Virginia	54021	Low	High	Low	Low	Q3	Mod
Grant	West Virginia	54023	Low	High	Low	Low	Q3	Mod
Greenbrier	West Virginia	54025	Mod	High	Low	Low	Q3	Mod
Hampshire	West Virginia	54027	Low	High	Low	Low	NOQ3	Mod
Hancock	West Virginia	54029	Low	High	Low	Low	Q3	Mod
Hardy	West Virginia	54031	Low	High	Low	Low	Q3	Mod
Harrison	West Virginia	54033	Low	High	Low	Low	Q3	Mod
Jackson	West Virginia	54035	Low	High	Low	Low	Q3	Mod
Jefferson	West Virginia	54037	Low	High	Low	Low	NOQ3	Mod
Kanawha	West Virginia	54039	Mod	High	Low	Low	Q3	Mod
Lewis	West Virginia	54041	Low	High	Low	Low	Q3	Mod
Lincoln	West Virginia	54043	Mod	High	Low	Low	Q3	Mod
Logan	West Virginia	54045	Mod	High	Low	Low	Q3	Mod
Marion	West Virginia	54049	Low	High	Low	Low	NOQ3	Mod
Marshall	West Virginia	54051	Low	High	Low	Low	Q3	Mod
Mason	West Virginia	54053	Low	High	Low	Low	Q3	Mod
McDowell	West Virginia	54047	Mod	High	Low	Low	Q3	Mod
Mercer	West Virginia	54055	Mod	High	Low	Low	NOQ3	Mod
Mineral	West Virginia	54057	Low	High	Low	Low	NOQ3	Mod
Mingo	West Virginia	54059	Mod	High	Low	Low	Q3	Mod
Monongalia	West Virginia	54061	Low	High	Low	Low	NOQ3	Mod
Monroe	West Virginia	54063	Mod	High	Low	Low	NOQ3	Mod
Morgan	West Virginia	54065	Low	High	Low	Low	NOQ3	Mod
Nicholas	West Virginia	54067	Mod	High	Low	Low	NOQ3	Mod
Ohio	West Virginia	54069	Low	High	Low	Low	Q3	Mod
Pendleton	West Virginia	54071	Low	High	Low	Low	NOQ3	Mod
Pleasants	West Virginia	54073	Low	High	Low	Low	NOQ3	Mod
Pocahontas	West Virginia	54075	Mod	High	Low	Low	NOQ3	Mod
Preston	West Virginia	54077	Low	High	Low	Low	NOQ3	Mod
Putnam	West Virginia	54079	Low	High	Low	Low	Q3	Mod
Raleigh	West Virginia	54081	Mod	High	Low	Low	Q3	Mod
Randolph	West Virginia	54083	Low	High	Low	Low	Q3	Mod
Ritchie	West Virginia	54085	Low	High	Low	Low	NOQ3	Mod

County	State	FIPS	EQ	LS	Wind	Torn	Flood	Icing
Roane	West Virginia	54087	Low	High	Low	Low	Q3	Mod
Summers	West Virginia	54089	Mod	High	Low	Low	Q3	Mod
Taylor	West Virginia	54091	Low	High	Low	Low	NOQ3	Mod
Tucker	West Virginia	54093	Low	High	Low	Low	Q3	Mod
Tyler	West Virginia	54095	Low	High	Low	Low	Q3	Mod
Upshur	West Virginia	54097	Low	High	Low	Low	Q3	Mod
Wayne	West Virginia	54099	Mod	High	Low	Low	Q3	Mod
Webster	West Virginia	54101	Low	High	Low	Low	NOQ3	Mod
Wetzel	West Virginia	54103	Low	High	Low	Low	Q3	Mod
Wirt	West Virginia	54105	Low	High	Low	Low	Q3	Mod
Wood	West Virginia	54107	Low	High	Low	Low	Q3	Mod
Wyoming	West Virginia	54109	Mod	High	Low	Low	Q3	Mod
Adams	Wisconsin	55001	Low	Mod	Mod	Mod	NOQ3	Mod
Ashland	Wisconsin	55003	Low	Mod	Low	Low	NOQ3	Mod
Barron	Wisconsin	55005	Low	Low	Mod	Mod	NOQ3	Mod
Bayfield	Wisconsin	55007	Low	Mod	Low	Low	Q3	Mod
Brown	Wisconsin	55009	Low	Mod	Mod	Mod	Q3	Mod
Buffalo	Wisconsin	55011	Low	High	Low	Low	NOQ3	Mod
Burnett	Wisconsin	55013	Low	Low	Low	Low	NOQ3	Mod
Calumet	Wisconsin	55015	Low	Mod	Mod	Mod	Q3	Mod
Chippewa	Wisconsin	55017	Low	Low	Mod	Mod	Q3	Mod
Clark	Wisconsin	55019	Low	Low	Low	Low	Q3	Mod
Columbia	Wisconsin	55021	Low	Mod	Mod	Mod	NOQ3	Mod
Crawford	Wisconsin	55023	Low	High	Low	Low	NOQ3	Mod
Dane	Wisconsin	55025	Low	Mod	Mod	Mod	Q3	Mod
Dodge	Wisconsin	55027	Low	Mod	Mod	Mod	Q3	Mod
Door	Wisconsin	55029	Low	Mod	Low	Low	NOQ3	Mod
Douglas	Wisconsin	55031	Low	High	Low	Low	NOQ3	High
Dunn	Wisconsin	55033	Low	Low	Low	Low	NOQ3	Mod
Eau Claire	Wisconsin	55035	Low	Low	Mod	Mod	Q3	Mod
Florence	Wisconsin	55037	Low	Low	Low	Low	NOQ3	Mod
Fond Du Lac	Wisconsin	55039	Low	Mod	Mod	Mod	Q3	Mod
Forest	Wisconsin	55041	Low	Low	Low	Low	NOQ3	Mod
Grant	Wisconsin	55043	Low	High	Mod	Mod	NOQ3	Mod
Green	Wisconsin	55045	Low	Mod	Mod	Mod	NOQ3	Mod
Green Lake	Wisconsin	55047	Low	Mod	Mod	Mod	NOQ3	Mod
Iowa	Wisconsin	55049	Low	Mod	Low	Low	NOQ3	Mod
Iron	Wisconsin	55051	Low	Mod	Low	Low	NOQ3	Mod
Jackson	Wisconsin	55053	Low	Low	Low	Low	NOQ3	Mod
Jefferson	Wisconsin	55055	Low	Low	Mod	Mod	Q3	Mod
Juneau	Wisconsin	55057	Low	Mod	Mod	Mod	NOQ3	Mod
Kenosha	Wisconsin	55059	Low	High	Low	Low	NOQ3	Mod
Kewaunee	Wisconsin	55061	Low	Mod	Mod	Mod	NOQ3	Mod
La Crosse	Wisconsin	55063	Low	High	Low	Low	Q3	Mod
Lafayette	Wisconsin	55065	Low	Mod	Mod	Mod	NOQ3	Mod
Langlade	Wisconsin	55067	Low	Low	Low	Low	NOQ3	Mod
Lincoln	Wisconsin	55069	Low	Low	Low	Low	NOQ3	Mod

County	State	FIPS	EQ	LS	Wind	Torn	Flood	Icing
Manitowoc	Wisconsin	55071	Low	Mod	Mod	Mod	Q3	Mod
Marathon	Wisconsin	55073	Low	Low	Low	Low	Q3	Mod
Marinette	Wisconsin	55075	Low	Low	Low	Low	Q3	Mod
Marquette	Wisconsin	55077	Low	Mod	Mod	Mod	NOQ3	Mod
Menominee	Wisconsin	55078	Low	Low	Low	Low	NOQ3	Mod
Milwaukee	Wisconsin	55079	Low	Mod	Mod	Mod	Q3	Mod
Monroe	Wisconsin	55081	Low	Mod	Low	Low	NOQ3	Mod
Oconto	Wisconsin	55083	Low	Mod	Low	Low	NOQ3	Mod
Oneida	Wisconsin	55085	Low	Low	Low	Low	NOQ3	Mod
Outagamie	Wisconsin	55087	Low	Mod	Low	Low	Q3	Mod
Ozaukee	Wisconsin	55089	Low	Mod	Low	Low	Q3	Mod
Pepin	Wisconsin	55091	Low	High	Low	Low	NOQ3	Mod
Pierce	Wisconsin	55093	Low	High	Low	Low	NOQ3	Mod
Polk	Wisconsin	55095	Low	Low	Low	Low	NOQ3	Mod
Portage	Wisconsin	55097	Low	Low	Low	Low	NOQ3	Mod
Price	Wisconsin	55099	Low	Low	Low	Low	NOQ3	Mod
Racine	Wisconsin	55101	Low	High	Mod	Mod	Q3	Mod
Richland	Wisconsin	55103	Low	Low	Low	Low	NOQ3	Mod
Rock	Wisconsin	55105	Low	Low	Mod	Mod	NOQ3	Mod
Rusk	Wisconsin	55107	Low	Low	Low	Low	NOQ3	Mod
Sauk	Wisconsin	55111	Low	Mod	Low	Low	NOQ3	Mod
Sawyer	Wisconsin	55113	Low	Low	Low	Low	NOQ3	Mod
Shawano	Wisconsin	55115	Low	Mod	Low	Low	NOQ3	Mod
Sheboygan	Wisconsin	55117	Low	Mod	Low	Low	NOQ3	Mod
St. Croix	Wisconsin	55109	Low	Low	Mod	Mod	NOQ3	Mod
Taylor	Wisconsin	55119	Low	Low	Low	Low	NOQ3	Mod
Trempealeau	Wisconsin	55121	Low	High	Low	Low	NOQ3	Mod
Vernon	Wisconsin	55123	Low	High	Low	Low	NOQ3	Mod
Vilas	Wisconsin	55125	Low	Low	Low	Low	NOQ3	Mod
Walworth	Wisconsin	55127	Low	Low	Mod	Mod	NOQ3	Mod
Washburn	Wisconsin	55129	Low	Low	Low	Low	Q3	Mod
Washington	Wisconsin	55131	Low	Low	Low	Low	NOQ3	Mod
Waukesha	Wisconsin	55133	Low	Low	Mod	Mod	Q3	Mod
Waupaca	Wisconsin	55135	Low	Low	Low	Low	Q3	Mod
Waushara	Wisconsin	55137	Low	Low	Low	Low	NOQ3	Mod
Winnebago	Wisconsin	55139	Low	Mod	Low	Low	Q3	Mod
Wood	Wisconsin	55141	Low	Low	Low	Low	Q3	Mod
Albany	Wyoming	56001	Mod	Mod	Low	Low	Q3	Low
Big Horn	Wyoming	56003	Mod	High	Low	Low	NOQ3	Low
Campbell	Wyoming	56005	Mod	High	Low	Low	NOQ3	Low
Carbon	Wyoming	56007	Mod	High	Low	Low	NOQ3	Low
Converse	Wyoming	56009	Mod	Mod	Low	Low	NOQ3	Low
Crook	Wyoming	56011	Mod	High	Low	Low	NOQ3	Low
Fremont	Wyoming	56013	Mod	High	Low	Low	NOQ3	Low
Goshen	Wyoming	56015	Mod	Mod	Mod	Mod	NOQ3	Low
Hot Springs	Wyoming	56017	Mod	High	Low	Low	NOQ3	Low
Johnson	Wyoming	56019	Mod	High	Low	Low	NOQ3	Low

County	State	FIPS	EQ	LS	Wind	Torn	Flood	Icing
Laramie	Wyoming	56021	Mod	Mod	Mod	Mod	NOQ3	Low
Lincoln	Wyoming	56023	High	High	Low	Low	NOQ3	Low
Natrona	Wyoming	56025	Mod	High	Low	Low	Q3	Low
Niobrara	Wyoming	56027	Mod	High	Low	Low	NOQ3	Low
Park	Wyoming	56029	High	High	Low	Low	NOQ3	Low
Platte	Wyoming	56031	Mod	Mod	Low	Low	NOQ3	Low
Sheridan	Wyoming	56033	Mod	High	Low	Low	NOQ3	Low
Sublette	Wyoming	56035	High	High	Low	Low	NOQ3	Low
Sweetwater	Wyoming	56037	Mod	High	Low	Low	Q3	Low
Teton	Wyoming	56039	High	High	Low	Low	NOQ3	Low
Uinta	Wyoming	56041	High	High	Low	Low	NOQ3	Low
Washakie	Wyoming	56043	Mod	High	Low	Low	NOQ3	Low
Weston	Wyoming	56045	Mod	High	Low	Low	NOQ3	Low