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# Final Citizen Corps Framework

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Organizing citizen  
volunteers to meet  
hazards of all kinds  
before disaster strikes

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PUBLIC SAFETY ADVISORY COMMISSION  
Approved October 1, 2008

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## 1. Introduction to the Framework

### A. Citizen Corps mission

1. The Mission of a volunteer-based **Citizen Corps** is to harness the power of every individual through education, training and volunteer service to make communities safer, stronger and better prepared for terrorism, crime, public health issues and disasters of all kinds.

### B. Statement of purpose

1. The City Council has entrusted the **Public Safety Advisory Commission** with the role of assisting staff in furthering emergency preparedness Citywide.
2. Establishing a volunteer **Citizen Corps** to organize, train, equip and activate citizens during an emergency is a desirable element of the City's emergency operations plan.
3. To this end, a **Citizen Corps Subcommittee** was tasked with developing a written framework for creating a local **Citizen Corps Council** (CCC) and defining action steps to lead and sustain the Citizen Corps once the CCC has been established.
4. The primary focus is upon establishing a permanent Citizen's Corps Council within six months of the adoption of the Citizen Corps Framework.
5. An equal task is to evaluate staffing to carry out public safety and related emergency preparedness activities and to make a budget rationale for authorizing a new Public Safety position at such time as it is affordable.

### C. A framework approach

1. The Citizen Corps Subcommittee has developed a step by step outline for establishing the Citizen Corps Council.
2. The Citizen Corps Council will use this framework to prepare annual operating goals and objectives, a program budget and an implementation schedule for the new Citizen Corps.

## 2. Situation Analysis

### A. Existing conditions and threats

1. The City of Lake Elsinore Emergency Operations Plan is the blueprint for responding to extraordinary emergency situations, either natural or man-made.
2. The City's Hazard Mitigation Plan identifies and ranks vulnerability by type, including:
  - a. Natural Hazards
    - i. Wildland fires
    - ii. Earthquake
    - iii. Flooding
    - iv. Extreme weather
    - v. Landslides
    - vi. Insect infestation
  - b. Technology Hazards

- i. Dam failure
- ii. Hazardous Materials (Hazmat) incidents
- iii. Transportation emergencies
  - 1. Highway
  - 2. Airline/airport
- iv. Pipeline/aqueduct incidents
- v. Blackout
- vi. Toxic pollution
- vii. Nuclear incidents
- c. Domestic security threats
  - i. Terrorism
    - 1. Chemical
    - 2. Biological
    - 3. Radiological
    - 4. Nuclear
    - 5. Explosive
  - ii. Civil unrest
  - iii. Jails and prisons incidents

3. *For most of the scenarios described above, it is likely that emergency responders could be overwhelmed by the sheer magnitude of the incident.*

## B. Updating our risk assessment

1. A ranking of local jurisdiction vulnerability in 2004 depicts a city that is at the greatest risk at any given time in the order shown:
  - a. Flood (see Appendix C)
  - b. Earthquake (see Appendix B)
  - c. Wildland fire (see Appendix A)
2. Today, this rank order is being reexamined, largely in the aftermath of California's devastating 2007 wildfires and recent map and computer analysis of fire risk developed by CAL FIRE. (see Appendix A)
3. Our conclusion is that the City of Lake Elsinore citizenry must be better prepared.

4. *A prepared citizenry is the difference between effective self-help and merely waiting for help that may not arrive for days.*

## C. Growth Impacts

1. From 2007 to 2008, Lake Elsinore's population grew from 47,669 to 49,807, a 4.5% change according to the California Department of Finance. In 2007, Lake Elsinore was the 2<sup>nd</sup> fastest growing city in Riverside County and ranked as the 3<sup>rd</sup> fastest growing city in the state.
2. Lake Elsinore consists of a 38 square mile area, including a 3000 acre lake, which is Southern California's largest natural lake.
3. According to the City's *General Plan Update*, Lake Elsinore's population is expected to reach **116,472 by 2030**, based on preferred land-use densities.

4. *These statistics underscore the need to proactively increase the City's emergency preparedness through direct citizen outreach and involvement.*

#### D. Performance gaps

1. The City Council has made public safety its number one priority. Currently, the City spends 46%, or approximately \$14 million of its \$30 million operating budget on public safety; namely, police and fire services.
2. Despite this commitment to public safety, first responders would be spread thin in the first hours or days of a catastrophic event, such as a major earthquake or fire.

3. *Even if spending on police and fire services were dramatically increased each year, the City's vulnerability would far exceed our Public Safety resources, because the City currently lacks a unified volunteer organization to assist in the event of a major disaster.*

#### E. Preliminary steps taken in the right direction

1. The City has taken positive steps to address the gap above; namely, increasing operational readiness and emphasis on Emergency Preparedness Planning.
2. The City has obtained grant funding to equip the City Yard with portable emergency trailers that contain emergency supplies and equipment to be deployed and used by trained CERT volunteers.
3. The City has also increased its commitment to training its employees and has sent a growing number of its workforce to CERT classes.
4. In addition, the City has regularly attended disaster planning meetings of the Southwest Com group and participates in regional Emergency Operations Center training exercises.

5. *The next step is to establish a permanent program for training and equipping citizen volunteers using the national model for Citizen Corps.*

### 3. Background of Citizen Corps

1. Citizen Corps is a comparatively new management and coordinating program created by the federal government in response to the terrorist attack on September 11, 2001.
2. Many government and volunteer groups have expressed the value of having a recognized organizational structure to gather volunteers and groups together to augment local emergency planning efforts.
3. A national model exists for Citizen Corps Councils, the administrative body of a local Citizen Corps, though the locality is free to develop a suitable structure using available resources.
4. The four charter federal programs of the Citizen Corps as defined by the Department of Homeland Security are: Community Emergency Response Team (CERT), Neighborhood Watch Program (NWP), Volunteers in Police Service (VIPS) and the Medical Reserve Corps (MRC).
5. Membership in the CCC is not limited to its core components. Other organizations that might appropriately be members of a CCC include: American Red Cross, Business associations, Community Based Organizations, other agencies, non-profit groups (i.e., churches), clubs and individuals.

6. A CCC is essentially a management and coordinating body, not an operational unit, though it is closely linked to operational entities and first responders.

## 4. Rationale for a Lake Elsinore Citizen Corps

### A. Constant state of readiness

1. A Citizen Corps exists primarily to increase community awareness and readiness for a variety of disaster scenarios through training volunteers and staff; through gathering resources and equipping volunteers; through drills and emergency exercises; and through cooperation with first responders in planning and mitigation assistance.
2. The Citizen Corps volunteers are not intended to replace a community's response capability, but rather, to serve as an important supplement to it. The Citizen Corps is a volunteer resource that is a part of the community's operational capability before, during and following a disaster.

3. *Citizen Corps provides continuing opportunities for voluntary involvement and participation in a range of activities to make families, households, and communities safer from threats and disasters of all kinds.*

### B. Self-reliance

1. Following a disaster, elements of a Citizen Corps, such as Neighborhood Watch and CERT, can activate immediately to perform a vital role in disaster mitigation.
2. Most notably, Citizen Corp participants are trained to be better prepared and better protected, in order to effectively help their communities do the same.

3. *The City currently has many volunteer organizations and resources from which to develop an active Citizen Corps, as shown in Appendix D.*

### C. Maintaining order

1. The City's Emergency Operations Plan is intended primarily to enable emergency service coordination through preparation, training and mobilization in the event of a disaster. Maintaining order is paramount to an effective emergency response and recovery.
2. By empowering citizens to prepare and protect their households and neighborhoods, first responders can more effectively deploy to areas of highest need following a disaster.
3. Lessons learned from Hurricane Katrina include educating the public to be prepared to be self sufficient longer than previously taught; that is, from 3 days to between 5-7, or more.

4. *As witnessed during the Katrina disaster, in the absence of first responders and trained volunteers to fill this gap, order simply cannot be maintained.*

### D. Continuity of services

1. The main task of local government and first responders following an emergency is to preserve or build-up the level of services needed to cope with disaster impacts.

2. A Citizen Corps can help narrow the gap between community expectations and community assistance, so first responders can concentrate on their primary duties under the Incident Command System.

3. *A disaster response in many of the vulnerability scenarios that affect Lake Elsinore is the shelter in place order. This would increase the City's reliance on trained volunteers to provide assistance immediately following a disaster and up to several days or weeks afterwards.*

## E. Recovery

1. The principle philosophy of a Citizen Corps is getting the community back to normal following extraordinary events or catastrophic loss.

2. *Strengthening a community by educating and training citizens to be prepared before disaster strikes, and self-reliance in times of a disaster are the primary benefit of a Citizens Corps.*

## 5. The Role of CERT Volunteers in Emergency Preparedness or During a Disaster

### A. Overview

1. The goal of using volunteers as helping hands to prepare and respond to a disaster is to save lives and protect property.
2. The Community Emergency Response Team (CERT) concept was developed in response to the view that citizens most likely will be on their own during the early stages of a catastrophic disaster.
3. CERT was implemented in 1985 by the LAFD, which concluded that basic training in disaster survival and rescue skills could improve the ability of citizens to survive until responders or other assistance is available.
4. CERT was selected as one of the primary programs offered to the American public in response to President Bush's 2003 call to action for citizens to be prepared to threat of disaster of all kinds.
5. In 1994, The Federal Emergency Management Agency (FEMA), under the auspices of the Emergency Management Institute (EMI), expanded CERT training to prepare individuals to help themselves, their families and their neighbors in the event of catastrophic disaster.

### B. Family and household preparedness

1. The CERT program can provide an effective first-response capability. Acting as individuals first, CERT volunteers are trained to prepare **in advance** of a disaster event.
2. Depending on the severity and type of disaster, it may take from several hours to several days for emergency responders to arrive. Therefore, immediately following a disaster—often up to 5-7 days or longer—individuals, households and neighborhoods may need to rely on their own resources for food, water first aid and shelter.

3. *Preparedness, planning, survival skills and mutual aid will make the difference coping with the aftermath of disaster within the first hours and days.*

### C. A Supporting role before first responders arrive

1. CERT volunteers are trained to respond in their neighborhoods and communities to address **immediate** needs brought about by the disaster.
2. The Key CERT training functions include:
  - a. Fire safety
  - b. Medical operations
  - c. Light search and rescue
  - d. Disaster psychology
3. Acting as teams, trained CERT volunteers can fan out within their assigned areas performing the following:
  - a. Extinguishing small fires
  - b. Turning off natural gas inlets to damaged homes
  - c. Performing light search and rescue
  - d. Rendering basic medical treatment
  - e. Helping disaster survivors cope with emotional stressors

### D. Specialized roles for advanced CERT members:

1. After completing initial CERT training, many seek to expand and improve their skills through specialized training in the following areas:
  - a. Shelter management
  - b. Community relations
  - c. Donations management
  - d. Special needs concerns
  - e. Debris removal
  - f. Utilities control
  - g. Advanced first aid
  - h. Automated External Defibrillator use
  - i. CPR skills
2. Lake Elsinore is fortunate to have a diverse community and a broad pool of skills from which to draw upon following a disaster.

3. *The advantage of having a Citizen Corps program is the ability to increase public awareness and attract skilled volunteers in advance disaster needs.*

## 6. Establishing a Lake Elsinore Citizen Corps & Citizen Corps Council

### A. Overview

1. A sustainable Citizen Corps depends on an effective **Citizen Corps Council**, which would be established to oversee public education on disaster mitigation and preparedness, citizen training and volunteer programs to give people of all ages and backgrounds the opportunity to support their community's emergency service.

2. Once established, the Citizen Corps Council will be responsible for developing goals and implementing the program objectives, budget and timetable.

## B. Action Steps

1. The action steps below and tentative schedule are proposed:
  - 1) Review draft framework (April 9, 2008)
  - 2) Adopt final framework (May 14, 2008)
  - 3) Budget & Staffing recommendation at FY 08-09 study session (May 14, 2008)
  - 4) Council consideration (May 27, 2008)
  - 5) Citizen Corps kickoff meeting with community leaders (October 1, 2008)
  - 6) Launch the Citizen Corps Council (January 2009)
  - 7) Adopt administrative procedures for the Citizen Corps Council (January 2009)
  - 8) Register a local chapter with Dept. of Homeland Security (January 2009)
  - 9) Revise action plan, implementation schedule and budget (April 2009)
  - 10) Implement the plan following FY 2009-2010 budget approval (July 1, 2009)

## C. Citizen Corps Council Composition

1. Citizen Corps is managed at the local level by the Citizen Corps Council.
2. Members would be appointed by the City Manager or designee, in consultation with the City's public safety service representatives (police, fire).
3. The voting members shown below are denoted by an asterisk (\*).
4. Members are generally City residents or own or operate businesses within the City Limits.
5. The Citizen Corps Council for Lake Elsinore would be comprised of the following agency representatives and members:
  - 1) PROGRAM ADMINISTRATOR: non-voting member
  - 2) CITY: Emergency Preparedness Coordinator or alternate\*
  - 3) PSAC: Public Safety Advisory Commission liaison\*
  - 4) LEPD: Neighborhood Watch/CSO liaison, or other designee\*
  - 5) FIRE: Fire Chief or designee\*
  - 6) LEUSD: Safety Officer/EOC Coordinator\*
  - 7) EVMWD: Safety Officer or designee\*
  - 8) LEVCC:\*
  - 7) BUSINESS: (one vote)\*
    - i. Local (e.g., Near Cal, Castle & Cooke, or other)
    - ii. Corporate (e.g., COSTCO, TARGET, LOWES, etc.)
  - 8) CIVILIAN AT LARGE: (e.g., an HOA representative)\*
  - 9) COMMUNITY BASED ORGANIZATION liaison: (e.g., representing Rotary, HOPE, Cops 4 Kids and others)\*
  - 10) EX OFFICIO MEMBERS (non-voting):
    - iii. Assemblyman Jeffries, or designee
    - iv. American Red Cross
    - v. Trauma Intervention Program (TIP)

- vi. Riverside County Office of Emergency Services (OES)
- vii. UTILITIES: (SCE, Gas Co, Verizon, Time-Warner Cable, etc.)

#### D. Authority of the Citizen Corps Council

1. Administrative and operating procedures will be set by Council Policy.
2. CCC meetings are open to the public and must conform to City Council Policy Manual, The Ralph M. Brown Act and other rules or bylaws.
3. The Lake Elsinore Citizen Corps is sponsored by the City of Lake Elsinore and operates within the City of Lake Elsinore limits, though mutual aid may be requested or offered.

### 7. Duties of the Citizen Corps Council

#### A. General Responsibilities

1. A partial listing of the duties of the Lake Elsinore Citizen Council is given below (not all inclusive):
  - a. Create short and long term operating or action plans
  - b. Identify existing volunteer groups, organizations for partnering
  - c. Volunteer recruitment
  - d. Coordinate CERT and related training
  - e. Identify operating units (e.g., neighborhoods, business districts or zones)
  - f. Create a database of qualified volunteers
  - g. Develop public information and communications plan
  - h. Provide accountability to the PSAC and City Council (annual report)
  - i. Develop public information materials and community outreach
  - j. Provide opportunities for interagency and joint exercises
  - k. Develop annual budget recommendations
  - l. Procurement
  - m. Developing grants and other funding sources
2. Essential duties of the Citizen Corps are further outlined in T4 FEMA EMI training literature and other Department of Homeland Security publications.

#### B. Volunteer Management

1. Identifying volunteer opportunities, providing training, and sustaining volunteers is the mainstay of the Citizen Corps.
2. The Citizen Corps Council is responsible for establishing systems and procedures for tracking volunteer qualifications, identifying training needs and opportunities, establishing procedures and protocol regarding the incident command structure, operating procedures for activation and so forth.
3. *The City does not have to reinvent the wheel; many excellent volunteer models are available to the City, including the Temecula Citizen Corps (T.C.C).*

## C. Training

1. Volunteers in Citizen Corps have vast opportunities to increase personal emergency preparedness and to develop specialized skills. Basic training courses are identified below:
  - a. Incident Command Concepts and Protocol
  - b. Basic Search & Rescue
  - c. First Aid
  - d. CERT
  - e. Radio Communications
  - f. Neighborhood Watch
  - g. Other
2. Training Resources available to the Citizen Corps Council and Citizen Corps volunteers include:
  - a. Homeland Security
  - b. OES
  - c. Red Cross
  - d. CSTI
  - e. Neighborhood Watch
  - f. And many more

## D. Communication

1. The Citizen Corps Council will periodically report its activities to the PSAC and City Council no less than quarterly, including an annual report submittal.
2. The Citizen Corps will provide Community and Public Information in conjunction with Information/Communications Manager.
3. Collateral materials include:
  - a. Annual Public Information Plan
  - b. Web site page
  - c. Online newsletter or e-mail blasts
  - d. Annual Reports
  - e. Agendas
  - f. Minutes
  - g. Publications such as recruitment brochures, safety tip sheets, etc.
  - h. The City's direct mail newsletter (formerly OUTLOOK newsletter)
  - i. News releases

## E. Program Evaluation

1. The Citizen Corps Council will develop an evaluation plan to regularly assess program effectiveness. Evaluation results will be included in the Annual CC Council Report.
2. Evaluation strategies should include:
  - a. Web surveys
  - b. Direct mail survey

- c. Onsite training and event evaluation forms

## 8. Staffing Needs Assessment

### A. Existing staff support

1. Staff support for PSAC and public safety is provided by multiple departments at skill levels ranging from clerical to administrative, plus legal and professional, and special consulting services.
2. The PSAC has previously recognized the need for additional PSAC administrative support. Emergency services planning and Citizen Corps program oversight could justifiably be combined into a new central administrative position.

### B. Citizen Corps staff needs by function

1. The Subcommittee has expressed its view that existing staff would not be able to implement a new ongoing program such as the Citizen Corps without affecting ongoing work priorities.
2. The list below characterizes the type of tasks to be performed in support of the Citizen Corps Council by multiple individuals in multiple departments:
  - a. Clerical tasks (record keeping, filing, word processing, etc.)
  - b. Public Records/City Clerk (meeting minutes, agendas and notices postings, filings, Notary services, City Council staff reports, etc.)
  - c. Procurement (purchasing, purchase orders)
  - d. Warehousing (equipment and supplies inventory, storage system)
  - e. Training & In-services (Red Cross, OES, CERT, First Aid, other)
  - f. Administration (meeting scheduling, liaison to Citizen Corps Council, volunteer recruitment & tracking, reports to Council, recognitions & ceremonies)
  - g. Communications (recruitment, e-newsletter, press releases, town hall meetings, Web site maintenance, Community partnerships, etc.)
  - h. Finance (Budget preparation, Grant writing, auditing, etc.)
  - i. Neighborhood Watch liaison (meetings, outreach)
  - j. Legal services as needed
  - k. Consulting services as needed

### C. Staffing recommendations

1. *The Citizen Corps subcommittee believes additional staffing will be needed to effectively carry out the Citizen Corps program and ongoing emergency preparedness tasks.*
2. The primary need is for a central administrative staff position to oversee public safety programs and emergency preparedness planning.
3. The duties of a new public safety position would include:
  - a. Emergency Preparedness planning
  - b. Emergency Operations coordination

- c. PSAC administration
  - d. Safety training
  - e. Citizen Corps Council administration
4. Public Staffing considerations should be a part of the annual budget development process.
  5. The PSAC should immediately begin working with staff to develop the rationale for a new public safety position, appropriate job description, salary range and budget request.
  6. The PSAC should inform the City Council of any staff recommendations prior to the annual budget (e.g., 2010).

7. *The PSAC recognizes that funding and hiring additional professional staff at a given time is subject to revenue availability and budget authorization by the City Council.*

## 9. Budget Requirements

### A. Program Cost considerations

1. The subcommittee recommends a \$10,000 budget request in FY 2008-09 to seed the start-up costs of a Citizen Corps Council. (This request was approved in June, 2009.)
2. Expenditures would be for safety equipment, communications equipment, emergency supplies, administration and training costs. This funding would be used at the discretion of the Citizen Corps Council.
3. Grant funds have successfully been used for EOC and CERT equipment and supplies; the Citizen Corps Council should be successful in applying for additional grants to defray first year and ongoing operating expenses.

### B. Staffing Costs

1. A separate discussion is needed to define an appropriate administrative position and related salary to take the City's Emergency Preparedness efforts, Citizen Corps and Public Safety programs to the next level.

2. *The subcommittee consensus is that now is the right time for the City to consider an administrative Public Safety position, or at such time as it is affordable.*

## 10. Sample Citizen Council Action Schedule

### A. First six months

1. Citizen Corps needs assessment
2. Draft Citizen Corps Framework
3. Present to City Council for consideration
4. Direct legal counsel to amend LEMC/prepare ordinance
5. Designate staff support

6. Kickoff meeting
7. Set Council composition/membership
8. Public Information outreach planning
9. Web page complete
10. Press release
11. Mid-year budget request

## **B. First year**

1. Bylaws, procedures for Citizen Corps
2. Operations study/needs assessment
3. Action plan Goals & objectives
4. Communications/public outreach
5. Web
6. Mailers
7. Community meetings/open houses/fairs
8. Media releases
9. Grant funding applications
10. CERT training: public
11. CERT training: employees (continue)
12. Annual evaluation
13. Annual report
14. Budget requests

## **C. Second year**

1. Administration
2. Communications/Public outreach
3. Volunteer recruitment
4. Grants
5. Annual evaluation
6. Annual report
7. Budget requests
8. Recruit in-house public safety administrator (as budget allows)

## **D. Third year**

1. Volunteer recruitment
2. Training exercise (Citywide)
3. Communication/Public outreach
4. Grants
5. Annual evaluation
6. Annual report
7. Budget requests

## Appendices

- A. Assessing Risk: Fire**
- B. Assessing Risk: Earthquake**
- C. Assessing Risk: Inundation**
- D. City of Lake Elsinore Emergency Volunteer Resource List**
- E. Glossary of Emergency Management Terms**
- F. For More Information**

### Appendix A

#### Assessing Risk: Fire

CAL FIRE recently released a study showing wildland fire risk for urban communities surrounded by wildland and open space. As shown below, Lake Elsinore’s risk is Very High for the entire City.

*Note: the area in pink is actually RED; it has been screened so that the City’s boundaries can easily be seen.*

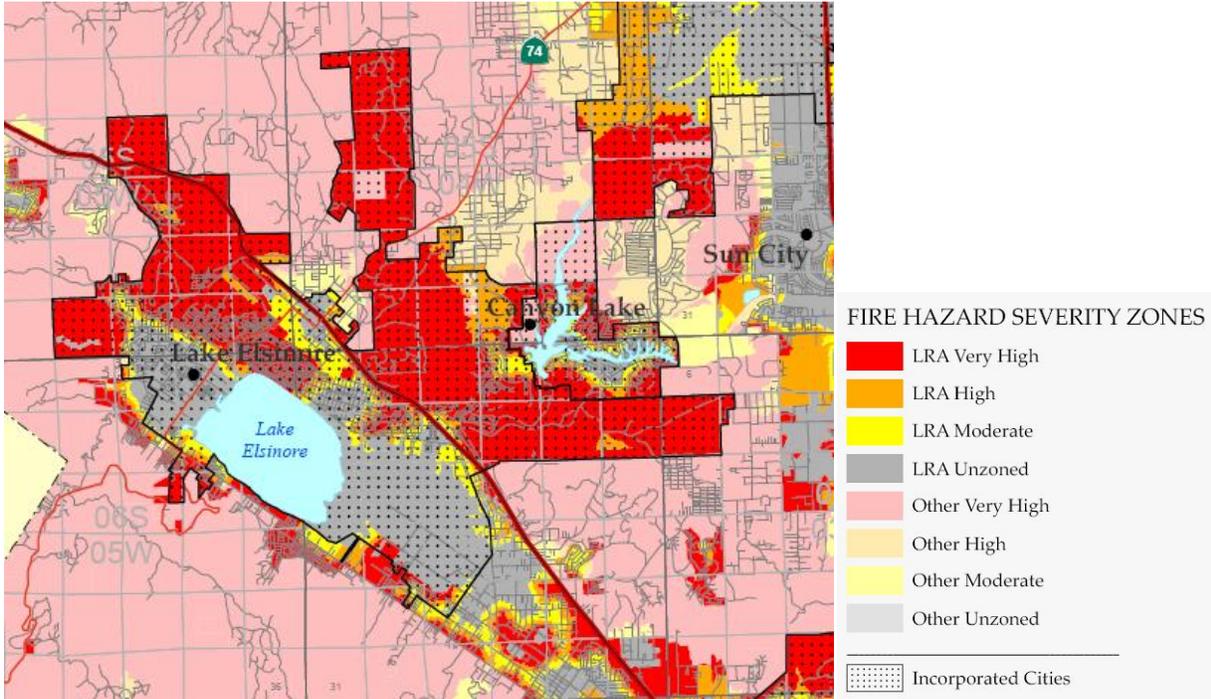


Figure 1. Source: CAL FIRE

### Appendix B

#### Assessing Risk: Earthquake

Lake Elsinore risk assessment includes a high probability for earthquake impacts. New evidence has recently surfaced about increased risk of activity along the Elsinore fault zone. Southwest California is also likely to experience significant impacts resulting from “The Big One” along the San Andreas fault.

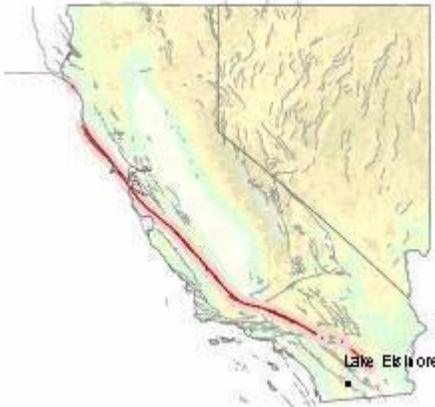


Figure 1. San Andreas Fault Zone

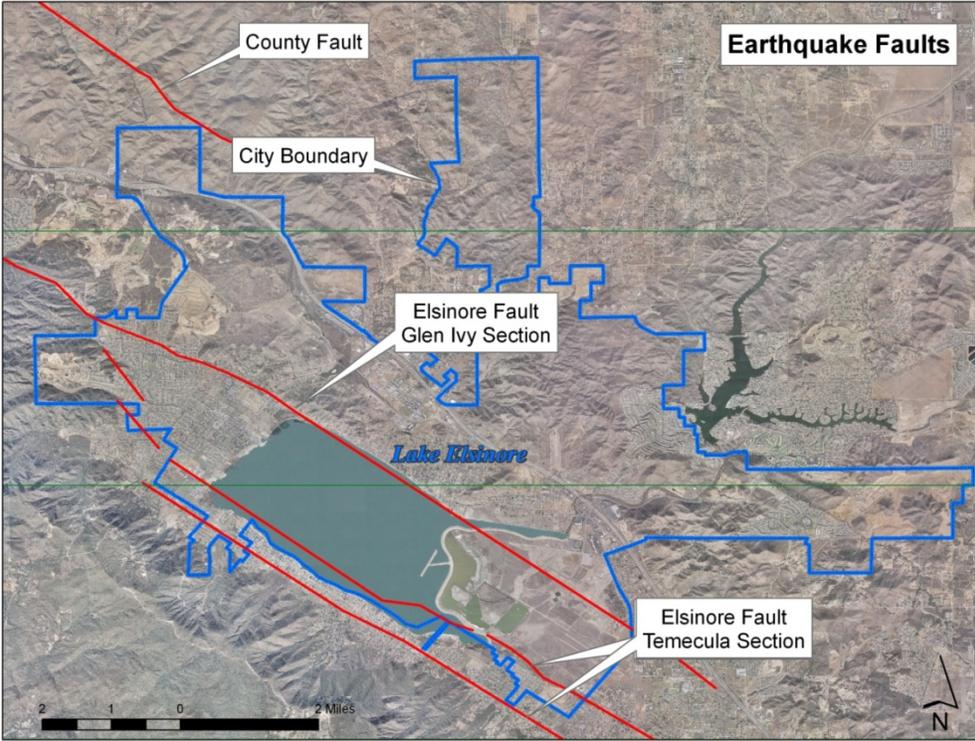


Figure 2. Elsinore Fault Zone

## REGION: Local fault capable of 7.5-magnitude quake

By DAVE DOWNEY - Staff Writer/Monday, April 14, 2008/ 6:58 PM PDT



Devastatingly large earthquakes ---- more destructive than previously imagined ---- could rock a fault line that slices under Temecula, Palomar Mountain and Julian, according to a report released Monday that delivers the first-ever statewide forecast of future temblors.

Geologists have often said the Elsinore fault, which could cause shock waves to cascade across northern San Diego and southern Riverside counties, was capable of generating quakes of up to magnitude 7 but no larger.

But Tom Rockwell, a San Diego State University geologist and expert on the fault, said in a telephone interview Monday that scientists now believe the Elsinore could trigger a quake as big as 7.5.

That means the fault is capable of producing quakes that are three times more powerful and release five times as much energy as previously believed.

Earthquake magnitudes are measured on a logarithmic scale. An increase of 1 translates into 10 times more power.

Rockwell was one of several scientists who worked on the report. Another was Chris Wills, supervising engineering geologist for the California Geological Survey in Sacramento.

"Bigger earthquakes are possible," Wills said.

On the positive side, however, because the fault is capable of shedding more of its accumulated stress in a single event than previously thought, quakes are likely to occur less often, he said.

In the first statewide forecast compiled by the state and federal survey agencies and the Southern California Earthquake Center, scientists said there is an 11 percent chance over the next 30 years that the fault will trigger an earthquake on the order of Northridge. That 1994 Los Angeles shaker measured 6.7 on the earthquake magnitude scale.

In a more narrowly focused 1995 report, scientists said such quakes had a 24 percent chance of occurring on the Elsinore.

The new statewide forecast also downgraded the likelihood of a Northridge-style quake striking the San Jacinto fault over the next three decades ---- from 61 percent to 31 percent. That fault is parallel to the Elsinore and to the east, running from Hemet in Riverside County to Anza-Borrego Desert State Park in San Diego County.

However, scientists concluded there is nearly a 6-in-10 chance an earthquake like Northridge will break along the San Andreas fault. Capable of producing a magnitude 8 shaker, the southern leg of the San

*Continued*

Andreas runs between San Bernardino and the border through the Salton Sea.

There is a 97 percent chance such a quake will strike Southern California by 2038 and a 93 percent chance that one will rock Northern California, the report said.

"It's almost a sure thing in either half of the state," Wills said.

He said scientists made the 6.7-magnitude Northridge quake their yardstick because so many people remember it. Northridge killed 72, injured more than 9,000, knocked out Interstate 10 in downtown Los Angeles and caused \$25 billion in damage.

Still, scientists did go beyond that threshold and found there is a 94 percent chance a magnitude 7 quake will occur somewhere in the state in the next 30 years and a 46 percent chance that a magnitude 7.5 temblor will strike.

The probability of a magnitude 8 quake is smaller: 4.5 percent.

Size doesn't always matter, however. Damage is determined in large part by location.

"A 6.7 will occur during the next 30 years, and I expect several," Wills said. "If we're lucky, they'll be like the Hector Mine earthquake. It was entirely on a Marine base (Twentynine Palms). It didn't affect anybody."

That remote 1999 quake was huge ---- it registered 7.1 ---- but it caused little damage.

"If we're unlucky, it will be like Northridge," Wills said.

As for individual faults, predictions were made only for the most active. No forecast was delivered for the Rose Canyon fault offshore of Oceanside and San Diego.

Forecasts for the more active Elsinore and San Jacinto faults were altered because of something scientists learned from another desert quake, the 7.3-magnitude Landers of 1992.

Before then, geologists thought a quake could rock just one segment of a fault.

Faults tend to be broken up in several segments. In the case of the Elsinore fault, Lake Elsinore's namesake body of water divides the Glen Ivy segment to the north and the Temecula segment to the south. And the two ends are more than a mile apart.

But Landers shattered the one-at-a-time theory.

"It broke all or parts of five faults," Rockwell said. "We would not have predicted that prior to that earthquake."

Rockwell said scientists now believe a quake could start on the Coyote Mountains segment near the border and rip across the Julian and Temecula segments ---- and possibly even jump Lake Elsinore.

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### Appendix C

### Assessing Risk: Inundation

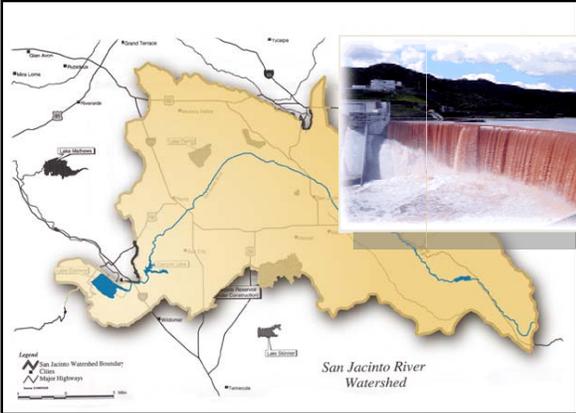


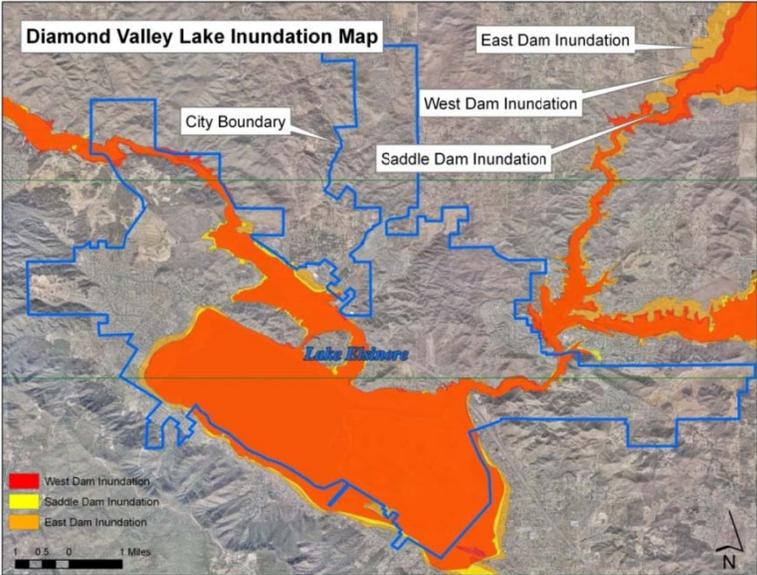
Figure 1. Lake Elsinore lies at the bottom of the San Jacinto River Watershed and receives all river flows.

Lake Elsinore is the terminus of the 750 square-mile San Jacinto River Watershed. Studies of flood risk show that Lake Elsinore is vulnerable to inundation from natural flooding and from catastrophic dam failure. Three upstream drinking water reservoirs with five dams combined are Canyon Lake (EVMWD), Lake Hemet (LHMWD) and Diamond Valley Lake (MWD).

Railroad Canyon Dam was constructed in 1927 and reinforced in 1998. The dam impounds 12,000 acre-feet of water (one acre foot equals 236,000 gallons of water). The entire dam acts as a spillway; any flows

over the spillway enter Lake Elsinore.

Figure 2 below illustrates inundation from Metropolitan Water District of Southern California’s Diamond



Valley Lake. Instances of a dam failure upstream would result in a surge of water into the San Jacinto River that would cause portions of the City to flood. The Lake would rapidly rise and the excess water would breach the overflow weir in the back basin, flooding the area behind the levee that has been designed for flood water storage of 30, 000 acre-feet of water.

Figure 2. Inundation scenarios for failure of any of the 3 dams at Diamond Valley Lake. All scenarios impact Lake Elsinore.

## Appendix D

### City of Lake Elsinore Emergency Volunteer Resource List

List is not inclusive, but illustrates the depth of Lake Elsinore’s emergency resource and volunteer pool.

#### First Responders

City of Lake Elsinore

Police

Fire

County

OES

State

Caltrans

SWCOMM (County, OES, Health, Schools, Police, Fire, Local Agencies)

#### Health/Medical/Hospitals

AMR

Rancho Springs

SW Healthcare

Urgent Care Centers

Physicians

Therapy Centers

*Other*

#### Local Agencies/Special Districts

County of Riverside

EVMWD

EWD

Lake Elsinore Cemetery District

LEUSD

Vector Control

#### Utilities

Southern California Edison

The Gas Co.

Time-Warner

Verizon California

#### Local Community Based Organizations (CBOs)

Animal Friends of the Valleys

Boys & Girls Clubs

Elsinore Valley Arts Network (EVAN)

H.O.P.E.

Lake Elsinore Woman’s Club

LE Historical Society

Lions Club

N.A.A.C.P.

Rotary Club International

*Continued*

**Local Community Based Organizations (CBOs)**

Scouting (Girl Scouts, Boy Scouts)  
United Way of Inland Valley  
*Other*

**Youth/Adult Leagues**

(See supplemental listings)  
Aquatics  
Baseball  
Basketball  
Soccer  
Wrestling  
*Other*

**Churches/Faith-based Organizations**

Salvation Army  
(See supplemental listing of area churches)

**Residential and Condo Owners Associations (HOAs)**

Tuscany Hills  
Canyon Hills  
Viscaya  
Rosetta  
Alberhill Ranch  
*Condo Associations:*  
    Brookside Terrace (Canyon Hills)  
    Fairfield Estates (SR 74)  
    LakePoint (Lakeshore Dr.)  
    Vista del Lago (Grape St.)  
*Other*

**Volunteer Organizations**

CERT  
LEMSAR  
Neighborhood Watch  
RACES  
Red Cross  
Trauma Intervention Program (TIP)  
*Other*

## Appendix E

### Glossary of Emergency Management Terms [Abridged]

This descriptive list from FEMA is eye-opening and convincing as to why Lake Elsinore is now focusing its capabilities, resources and planning on preparing for disasters of all kinds using the Citizen Corps model.

#### Glossary of Emergency Management Terms April 2007

This "Select Emergency Management-Related Terms and Definitions" document has been compiled by B. Wayne Blanchard, Ph.D., CEM, FEMA emergency management higher education project manager, for use in the Higher Education Project course, "Theory, Principles and Fundamentals of Hazards, Disasters and U.S. Emergency Management."

This is not a comprehensive list of emergency management terms and definitions. If you have suggestions for the list, please e-mail them for consideration to [Dr. Wayne Blanchard](mailto:Dr. Wayne Blanchard).

**Internet Reference:** <http://www.csc.noaa.gov/vata/glossary.html>

#### Terms and Definitions

##### A

**Acceptable Risk:** That level of risk that is sufficiently low that society is comfortable with it. Society does not generally consider expenditure in further reducing such risks justifiable. (Australian National 1994)

**Acceptable Risk:** Degree of humans and material loss that is perceived as tolerable in actions to minimize disaster risk. (Nimpuno 1998)

**Acceptable Risk:** Degree of human and material loss that is perceived by the community or relevant authorities as tolerable in actions to minimize disaster risk. (U.N. 1992, 3)

**Accident:** "The word 'accidental' carries with it the connotations of both something that occurs by chance and something non-essential or incidental" (Allinson 1993, 15). "The thesis that 'accidents will happen' and that therefore nothing can be done to prevent their occurrence reaches its logical fulfillment in the thesis of Charles Perrow that accidents are so inevitable and therefore non-preventable that we are even justified in calling them 'normal'" (Allinson, p.16).

**Accident:** "Unintended damaging event, industrial mishap" (Disaster and Emergency Reference Center 1998).

**Accident:** "An unexpected or undesirable event, especially one causing injury to a small number of individuals and/or modest damage to physical structures. Examples would be automotive accidents or damage from lightning striking a house." (Drabek 1996, Session 2, p. 3)

**Accident:** ". . . situations in which an occasion can be handled by . . . emergency organizations. The demands that are made on the community are within the scope of domain responsibility of the usual emergency organizations such as police, fire, medical and health personnel. Such accidents create needs (and damage) which are limited to the accident scene and so few other community facilities are damaged. Thus, the emergency response is delimited in both location and to the range of emergency activities. The primary burden of emergency response falls on those organizations that incorporate clearly deferred emergency responsibility into their domains. When the emergency tasks are completed, there are few vestiges of the accident or lasting effects on the community structure" (Dynes 1998, 117).

**Accident:** "The very language used to describe the [TMI] accident revealed the very diverse perceptions that enter such interpretations. Was it an accident or an incident? A catastrophe or a mishap? A disaster or an event? A technical failure or a simple mechanical breakdown?" (Nelkin 1981, 135).

**Accident:** An event which only requires the response of established organizations - expansion or actions such as going to extra shifts is not called for. (Quarantelli 1987, 25)

**Accident:** "The evidence. . . suggests that accidents are not the product of divine caprice, nor of a set of random chance events which are not likely to recur, but that they are incidents, created by people, which can be analyzed, and that the lessons learned from that analysis, if implemented, will help to prevent similar events from taking place again." (Toft 1992, 58)

**Accident, Technological:** "Technological accidents. . . are almost never understood as the way the world of chance sorts itself out. They provoke outrage rather than acceptance or resignation. They generate a feeling that the thing ought not have happened, that someone is at fault, that victims deserve not only compassion and compensation but something akin to what lawyers call punitive damages." (Erikson, 1989, 143)

**Acts of God:** Natural disasters or freak accidents. (Birkland 1997, 2.)

"When society seems to have formed a consensus that the event was an 'act of God,' such as a natural disaster or freak accident, our attention turns to what we can do to help the victims. But when the disaster is the result of human failings - poor design, operator error, 'corporate greed,' or 'government neglect' - our attention turns to the voluntary acceptance of responsibility for an event or to the more coercive process of fixing blame. Boards of inquiry are formed, legislatures hold hearings, and reports are issued, all in hopes of 'learning something from this incident' to ensure that something similar does not happen again or in the case of 'unavoidable' disasters, in hopes of improving our preparation for and response to disasters" (Birkland 1997, 2).

**Acts of God:** A fatalistic "syndrome whereby individuals feel no personal responsibility for hazard response and wish to avoid expenditure on risk reduction" (Smith 1996, 70).

**Alert:** Advisory that hazard is approaching but is less imminent than implied by warning message. See also "warning". (U.N. 1992, 3)

**Assessment:** Survey of a real or potential disaster to estimate the actual or expected damages and to make recommendations for preparedness, mitigation and relief action. (Reference Center 1998)

**Avalanche:** Mass of snow and ice falling suddenly down a mountain slope and often taking with it earth, rocks and rubble of every description. (WMO 1992, 66)

## B

**Base Flood:** A term used in the National Flood Insurance Program to indicate the minimum size flood to be used by a community as a basis for its floodplain management regulations; presently required by regulation to be "that flood which has a one-percent chance of being equaled or exceeded in any given year." Also known as a 100-year flood or one-percent chance flood.

**Beaufort Scale:** Numerical scale from 0 to 12, indicating wind force.

0 – calm

1 – light air

2 – light breeze

3 – gentle breeze

4 – moderate breeze

5 – fresh breeze

6 – strong breeze  
 7 – strong wind  
 8 – gale  
 9 – strong gale  
 10 – storm  
 11 – violent storm  
 12 – hurricane

(Reference Center 1998)

**Blizzard:** Violent winter storm, lasting at least 3 hours, which combines below freezing temperatures and very strong wind laden with blowing snow that reduces visibility to less than 1 km. (WMO 1992, 86)

## C

**Calamity:** "A massive or extreme catastrophic disaster that extends over time and space." Notes the Black Death of the 14th century as an example. (Drabek 1996, Session 2, p.4)

**Catastrophe:** "An event in which a society incurs, or is threatened to incur, such losses to persons and/or property that the entire society is affected and extraordinary resources and skills are required, some of which must come from other nations.

**Catastrophe:** ". . . an event that causes \$25 million or more in insured property losses and affects a significant number of property-casualty policyholders and insurers." (Insurance Services Office 2000, 2)

**Catastrophe:** An event of such impact upon a community that new organizations must be created in order to deal with the situation. (Quarantelli 1987, 25)

**Catastrophe:** ". . . for a given society might be defined as an event leading to 500 deaths or \$10 million in damages. These figures, however, are arbitrary since levels of impact mean different things to different people in different situations. Furthermore, we cannot ignore the element of scale. It would be a catastrophe for a small community if every building were totally destroyed by flooding (as occurred in 1993 in Valmeyer, Illinois), but at the global scale, it would be an insignificant event if only 350 houses were involved. . . Similarly, \$10 million in damage to some communities would be devastating. . . , especially in less wealthy societies, but others would be able to cope relatively easily" (Tobin and Montz 1997, 7).

". . . a catastrophe not only disrupts society, but may cause a total breakdown in day-to-day functioning. One aspect of catastrophes, is that most community functions disappear; there is no immediate leadership, hospitals may be damaged or destroyed, and the damage may be so great and so extensive that survivors have nowhere to turn for help (Quarantelli, 1994). In disaster situations, it is not unusual for survivors to seek help from friends and neighbors, but this cannot happen in catastrophes. In a disaster, society continues to operate and it is common to see scheduled events continue. . ." Tobin and Montz 1997, 31).

**Catastrophic Disaster:** An event that results in large numbers of deaths and injuries; causes extensive damage or destruction of facilities that provide and sustain human needs; produces an overwhelming demand on State and local response resources and mechanisms; causes a severe long-term effect on general economic activity; and severely affects State, local, and private-sector capabilities to begin and sustain response activities. Note: the Stafford Act provides no definition for this term. (FEMA 1992, FRP Appendix B)

**CHEMTREC:** The Chemical Transportation Emergency Center, 24-hour contact number 1-800-424-9300 in CONUS, 202-483-7616 outside the continental United States. A service, sponsored by the chemical industry, which provides two stages of assistance to responders dealing with potentially hazardous materials. First, on receipt of a call providing the name of a chemical judged by the responder to be a

potentially hazardous material, CHEMTREC provides immediate advice on the nature of the chemical product and the steps to be taken in handling it. Second, CHEMTREC promptly contacts the shipper of the material involved for more detailed information and on-scene assistance when feasible. (DOT 1993)

**Civil Defense (CD):** All activities and measures designed or undertaken for the following reasons: (a) to minimize the effects upon the civilian population caused by, or which would be caused by, an attack upon the United States or by a natural disaster; (b) to deal with the immediate emergency conditions which would be created by any such attack or natural disaster; and (c) to effectuate emergency repairs to, or the emergency restoration of, vital utilities and facilities destroyed or damaged by any such attack or natural disaster. (FEMA 1990)

**Civil Defense:** The system of measures, usually run by a governmental agency, to protect the civilian population in wartime, to respond to disasters, and to prevent and mitigate the consequences of major emergencies in peacetime. The term "civil defense" is now used increasingly. (UN 1992, 17)

**Civil Disturbances:** Group acts of violence and disorders prejudicial to public law and order within the 50 States, District of Columbia, Commonwealth of Puerto Rico, U.S. possessions and territories, or any political subdivision thereof. As more specifically defined in DoD Directive 3025.12 (Military Support to Civil Authorities), "civil disturbance" includes all domestic conditions requiring the use of Federal Armed Forces. (Title 32 CFR 185)

**Civil Emergency:** Any natural or manmade disaster or emergency that causes or could cause substantial harm to the population or infrastructure. This term can include a "major disaster" or "emergency" as those terms are defined in the Stafford Act, as amended, as well as consequences of an attack or a national security emergency. Under 42 U.S.C. 5121, the terms "major disaster" and "emergency" are defined substantially by action of the President in declaring that extant circumstances and risks justify his implementation of the legal powers provided by those statutes. (Title 32 CFR 185)

**Civil Protection:** "The phrase 'civil protection' has gradually come into use around the world as a term that describes activities which protect civil populations against incidents and disasters (Mauro, 1996). . . Civil protection has gradually and rather haltingly emerged from the preceding philosophy of civil defense." (Alexander, 2002, 4)

**Community Awareness and Emergency Response (CAER):** A program developed by the Chemical Manufacturers Association providing guidance for chemical plant managers to assist them in taking the initiative in cooperating with local communities to develop integrated (community/industry) hazardous materials emergency plans. (FEMA 1990)

**Comprehensive Emergency Management:** "Comprehensive Emergency Management means integrating all actors, in all phases of emergency activity, for all types of disasters." (NGA 1978, 111)

**Comprehensive Emergency Management:** "CEM refers to a state's responsibility and unique capability to manage all types of disasters by coordinating wide-ranging actions of numerous agencies. The 'comprehensive' aspect of CEM includes all four phases of disaster activity: mitigation, preparedness, response and recovery for all risks -- attack, man-made, and natural -- in a federal-state-local operating partnership." (NGA 1978, 203)

**Comprehensive Emergency Management:** An integrated approach to the management of emergency programs and activities for all four emergency phases (mitigation, preparedness, response, and recovery), for all types of emergencies and disasters and for all levels of government and the private sector.

**Comprehensive Environmental Response, Compensation and Liability Act (CERCLA):** Public Law 96-510, as amended. More popularly known as "Superfund," CERCLA provides authority for Federal and State governments to respond directly to hazardous substances incidents. (FEMA 1992, Appendix C)

**Conflict Hazards:** War, acts of terrorism, civil unrest, riots, and revolutions.

**Consequence:** The outcome of an event or situation expressed qualitatively or quantitatively, being a loss, injury, disadvantage or gain. (Standards 1995)

**Consequence Analysis:** The estimation of the effect of potential hazardous events. (New South Wales 1989).

**Consequence Management (COM):** Involves measures to alleviate the damage, loss, hardship, or suffering caused by emergencies. It includes measures to restore essential government services, protect public health and safety, and provide emergency relief to affected governments, businesses, and individuals. (FEMA, Weapons of Mass Destruction-Nuclear Scenario)

**Consequence Management:** "Relative to terrorism incident operations, measures to protect public health and safety, restore essential government services, and provide emergency relief to governments, businesses and individuals affected by the consequences of terrorism." (FEMA Disaster Dictionary 2001, 22; cites Federal Response Plan, "Terrorism Incident Annex.")

**Contingency Planning:** "Asking about all the 'what if's that might occur in the activities of an organization and the dangers faced in the external environment." (Lerbinger 1997, 267)

**Continuity of Government:** All measures that may be taken to ensure the continuity of essential functions of governments in the event of emergency conditions, including line-of-succession for key decision-makers.

**Crisis:** ". . . a decisive or critical moment or turning point when things can take a dramatic turn, normally for the worse. . ." (Allinson 1993, 93; based upon Webster's New International Dictionary, Unabridged, 2nd ed.)

**Crisis:** Short period of extreme danger, acute emergency. (D&E Reference Center 1998)

**Crisis:** "Crises involve events and processes that carry severe threat, uncertainty, an unknown outcome, and urgency. . . Most crises have trigger points so critical as to leave historical marks on nations, groups, and individual lives. Crises are historical points of reference, distinguishing between the past and the present. . . Crises come in a variety of forms, such as terrorism (New York World Trade Center and Oklahoma bombings), natural disasters (Hurricanes Hugo and Andrew in Florida, the Holland and Bangladesh flood disasters), nuclear plant accidents (Three-Mile Island and Chernobyl), riots (Los Angeles riot and the Paris riot of 1968, or periodic prison riots), business crises, and organizational crises facing life-or-death situations in a time of rapid environmental change. . . Crises consist of a 'short chain of events that destroy or drastically weaken' a condition of equilibrium and the effectiveness of a system or regime within a period of days, weeks, or hours rather than years. . . Surprises characterize the dynamics of crisis situations. . . Some crises are processes of events leading to a level of criticality or degree of intensity generally out of control. Crises often have past origins, and diagnosing their original sources can help to understand and manage a particular crisis or lead it to alternative state of condition" (Farazmand 2001, 3-4)

**Crisis:** ". . . an event and/or a situation which endangers the established system, the health, life, and property of its members. . . the term 'crisis' is treated as being separated from. . . other concepts based on the intensity and scope of influence. The terms disaster, hazard, accident, etc., refer to only one event and/or situation, while crisis includes the concepts of natural disasters, man-made/technological disasters, and social disasters." (Kim and Lee 2001, 502)

**Crisis:** "Crises act as focusing events, demanding public attention to a policy failure or problem. . . A great war, a major depression, or an epidemic may set into motion a number of important changes in public policies." (Nice and Grosse 2001, 55)

**Crisis:** ". . . a hard and complicated situation. . . or a turning point-a decisive crucial time/event, or a time of great danger or trouble with the possibilities of both good and bad outcomes" (Porfiriev 1995, 291-292).

**Crisis:** "A collective crisis can be conceptualized as having three interrelated features: (1) a threat of some kind, involving something that the group values; (2) when the occasion occurs it is relatively unexpected, being abrupt, at least in social time; and (3) the need to collectively react for otherwise the effects are seen as likely to be even more negative if nothing is done sooner or later..." (Quarantelli 1998, 257).

**Crisis:** ". . . a situation that, left unaddressed, will jeopardize the organization's ability to do business." (Ziaukas 2001, 246; citing other sources)

**Crisis Management:** In the literature that exists so far, the term "crisis management" has been widely employed. But this terminology is ambiguous. "Crisis management" can be taken to refer either to managing a crisis after it has arisen-that is, intervening in a crisis situation-or managing in such a way that a crisis does not arise in the first place. The blanket term "crisis management" is thus a conceptual blanket that covers a multitude of sins. It is best to avoid the usage of such a label, since the inclusion of the word "management" in such a label implies that the process so labeled is envisioned as a solution to the problem of crises in general. This, however, is not really the case. At best, so-called crisis management addresses only crises that have already arisen and usually only when such crises have become either imminent or already actualized disasters. (Allinson 1993, 92)

Since "crisis management" is used in the literature to refer for the most part to either how one responds to an existent crisis or how one might anticipate crises and therefore be able to respond to them, crisis management most often connotes crisis intervention management whether after the onset of the disaster or in anticipation of a disaster. In either of these two modes, it is nevertheless a "band-aid" approach since it either comes into effect after the wound or primarily addresses itself to having a band-aid ready to cover the wound immediately so that the wound does not bleed overly much. (Allinson 1993, 93)

**Crisis Management:** Coordination of actions during acute emergency. (D&E Reference Center 1998)

**Crisis Management:** "Key to crisis management is an accurate and timely diagnosis of the criticality of the problems and the dynamics of events that ensue. This requires knowledge, skills, courageous leadership full of risk-taking ability; and vigilance. Successful crisis management also requires motivation, a sense of urgency, commitment, and creative thinking with a long-term strategic vision. In managing crises, established organizational norms, culture, rules and procedures become major obstacles: administrators and bureaucrats tend to protect themselves by playing a bureaucratic game and hiding behind organizational and legal shelters. A sense of urgency gives way to inertia and organizational sheltering and self-protection by managers and staff alike. . . .Successful crisis management requires: (1) sensing the urgency of the matter; (2) thinking creatively and strategically to solving the crisis; (3) taking bold actions and acting courageously and sincerely; (4) breaking away from the self-protective organizational culture by taking risks and actions that may produce optimum solutions in which there would be no significant losers; and (5) maintaining a continuous presence in the rapidly changing situation with unfolding dramatic events. (Farazmand 2001, 4)

**Crisis Management(CRM):** Involves measures to resolve the hostile situation, investigate, and prepare a criminal case for prosecution under federal law. (FEMA 1998)

**Crisis Management:** "Measures to identify, acquire, and plan the use of resources needed to anticipate, prevent, and/or resolve a threat or act of terrorism." (FEMA Disaster Dictionary, 2001, 26; citing FEMA FRP, "Terrorism Incident Annex")

**Damage Assessment:** The process utilized to determine the magnitude of damage and the unmet needs of individuals, businesses, the public sector, and the community caused by a disaster or emergency event.

**Damage Classification:** Evaluation and recording of damage to structures, facilities, or objects according to three (or more) categories:

1. "Severe Damage" - which precludes further use of the structure, facility, or object for its intended purpose.
2. "Moderate Damage" - or the degree of damage to principal members, which precludes effective use of the structure, facility, or object for its intended purpose, unless major repairs are made short of complete reconstruction.
3. "Light Damage" - such as broken windows, slight damage to roofing and siding, interior partitions blown down, and cracked walls; the damage is not severe enough to preclude use of the installation for the purpose for which it was intended. (U.N. 1992, 19)

**Declaration:** The formal action by the President to make a State eligible for major disaster or emergency assistance under the Robert T. Stafford Relief and Emergency Assistance Act, Public Law 93-288, as amended.

**Defense Emergency Response Fund:** Established by Public Law 101-165 (1989). That law provides that, "The Fund shall be available for providing reimbursement to currently applicable appropriations of the Department of Defense for supplies and services provided in anticipation of requests from other Federal departments and agencies and from State and local governments for assistance on a reimbursable basis to respond to natural or manmade disasters. The Fund may be used upon a determination by the Secretary of Defense that immediate action is necessary before a formal request for assistance on a reimbursable basis is received." The Fund is applicable to military support to civil authorities (MSCA) under DoD Directive 3025.1 and to foreign disaster assistance under DoD Directive 5100.46. (32 CFR 185)

**Disaster:** An event that requires resources beyond the capability of a community and requires a multiple agency response. (Unknown source)

**Disaster:** The result of a hazard impacting a community. (Unknown source)

**Disaster:** "For insurance purposes a disaster is defined internationally as an event that causes at least US\$5 million in reimbursable losses." (Alexander, no date, 4)

**Disaster:** "The distinction between natural hazards or disasters and their manmade (or technological) counterparts is often difficult to sustain. . .we are dealing with a physical event which makes an impact on human beings and their environment. . .a natural disaster can be defined as some rapid, instantaneous or profound impact of the natural environment upon the socio-economic system" (Alexander 1993, 4).

**Disaster:** "The label 'disaster' rather than 'accident' carries with it not only the implication that. . .an event. . .was of extraordinary misfortune. . .but also the implication that it could (unlike most accidents) have been prevented. . .disasters are events which fall within our scope of concern to prevent and in principle are events which may be prevented, and that we have a consequent obligation to attempt to prevent them" (Allinson 1993, 168-169).

**Disaster:** ". . .Allen Barton characterized disaster as a type of collective stress situation in which 'many members of a social system fail to receive expected conditions of life from the system' (1969: 38). For Barton, what distinguishes disasters from other types of collective stress, such as war, is that the sources of disasters are external rather than internal." (Tierney, Lindell and Perry 2001, 9)

**Disaster:** "A disaster is an emergency considered severe enough by local government to warrant the response and dedication of resources beyond the normal scope of a single jurisdiction or branch of local government." (Carroll 2001, 467)

**Disaster:** "An event, natural or man-made, sudden or progressive, which impacts with such severity that the affected community has to respond by taking exceptional measures." (Carter 1991)

**Disaster:** ". . . a disaster is a singular event that results in widespread losses to people, infrastructure, or the environment. Disasters originate from many sources, just as hazards do (natural systems, social systems, technology failures). (Cutter 2001, 3)

**Disaster:** Calamity beyond the coping capacity of the effected population, triggered by natural or technological hazards or by human action. (D&E Reference Center 1998)

**Disaster:** "Disasters do not cause effects. The effects are what we call a disaster" (Dombrowsky 1998, 21).

**Disaster:** "An event in which a community undergoes severe danger and incurs, or is threatened to incur, such losses to persons and/or property that the resources available within the community are exceeded. In disasters, resources from beyond the local jurisdiction, that is State or Federal level, are required to meet the disaster demands." (Drabek 1996, 2-4)

**Disaster:** "I argue that disaster is a social, rather than a 'natural,' happening. Thus, any effort at disaster reduction involves planning and action by various social units." (Dynes 1993, 175) And, ". . . disasters are qualitatively as well as quantitatively different from accidents and everyday emergencies." (pp. 178-179)

**Disaster:** "A disaster is a normatively defined occasion in a community when extraordinary efforts are taken to protect and benefit some social resource whose existence is perceived as threatened" (Dynes

**Disaster:** An occurrence that has resulted in property damage, deaths, and /or injuries to a community. (FEMA 1990, Definitions and Terms, Instruction 5000.2)

**Disaster:** Any event "concentrated in time and space, in which a society of a relatively self-sufficient subdivision of society, undergoes severe danger and incurs such losses to its members and physical appurtenances that the social structure is disrupted and the fulfillment of all or some of the essential functions of the society is prevented" (Fritz 1961, 655)

**Disaster:** ". . . a situation involving damage and/or loss of lives beyond one million German marks and/or 1,000 person killed." (German insurance industry. Dombrosky's words (1998, 20))

**Disaster:** ". . . such severe interference of the public order and safety that in intervention of the centralized, coordinated disaster protection units is necessary." (German law. Dombrowsky 1998, 20 citing Seeck 1980, 1)

**Disaster:** An "extraordinary situation in which the everyday lives of people are suddenly interrupted and thus protection, nutrition, clothing, housing, medical and social aid or other vital necessities are requested." (German Red Cross. Dombrowsky 1998, 20, citing Katastrophen-Vorschrift 1988, 2)

**Disaster:** ". . . disasters arise from the exposure of vulnerable populations to hostile environments generated by the failure of complex systems. . . such systems are made vulnerable to failure by the complex interplay of factors including elements of the political economy environment in which the system is embedded." (Horlick-Jones and Peters 1991b, 41)

**Disaster:** Events that ". . .release repressed anxiety [and constitute a] loss of control of social order" (Horlick-Jones 1995, 305).

**Disaster:** "Disasters are non-routine events in societies or their larger subdivisions (e.g. regions, communities) that involve social disruption and physical harm. Among the key defining properties of such events are (1) length of forewarning, (2) magnitude of impact, (3) scope of impact, and (4) duration of impact" (Kreps 1998, 34).

**Disaster:** ". . .earthquakes are quite harmless until you decide to put millions of people and two trillion dollars in real estate atop scissile fault zones" (Riesner 1993, 501).

**Disaster:**"A situation created by natural and or man-made events, other than war or internal strife which demands total integration and co-ordination, by those responsible for administration of the affected region including: 1. all rescue, relief and life support systems required to meet the needs of the victims, essential transportation and communication systems. 2. repairs to the infrastructure. 3. post-disaster rehabilitation and recovery." (Ritchie, et al. 2001, 2)

**Disaster:** A Condition or situation of significant destruction, disruption and/or distress to a community. (Salter 1997-98, 27)

**Disaster:** All events which cause at least 100 human deaths, 100 human injuries, or US \$1 million economic damages. (Sheehan and Hewitt 1969, p. 20)

**Disaster:**"Disasters are the interface between an extreme physical event and a vulnerable human population." (Susman et al, 1983)

**Disaster:**"A serious disruption of the functioning of a community or a society causing widespread human, material, economic or environmental losses which exceed the ability of the affected community/society to cope using its own resources." (U.N. ISDR 2002, 24)

**Disaster:** A "sudden and extraordinary misfortune" to signify the actual onset of a calamity (Allinson 1993, 93; referring to Webster's New International Dictionary, Unabridged, 2nd edition).

**Disaster Agent:** "A class or category of phenomena that cause disasters, such as hurricanes, tornadoes, or explosions. Hurricane Andrew is a specific disaster event which reflected one of the classes of disaster agents, that is, hurricanes. Andrew is the disaster, hurricane is the disaster agent." (Drabek 1996, Session 2, p.6)

**Disaster, Ecological:** Events "that are caused principally by human beings and that initially affect, in a major way, the earth, its atmosphere, and its flora and fauna." (Drabek and Hoetmer 1991, xxi)

**Disaster Epidemiology:** The medical discipline that studies the influence of such factors as the life style, biological constitution and other personal or social determinants on the incidence and distribution of disease as it concerns disasters. (U.N. 1992, 22)

**Disaster Management:** The entire process of planning and intervention to reduce disasters as well as the response and recovery measures. It is a neglected element of development planning. (D&E Reference Center 1998)

**Disaster Management:** "Disaster management is the process of forming common objectives and common values in order to encourage participants to plan for and deal with potential and actual disasters." (Pearce, 2000, Chapter 2, 11)

"A process that assists communities to respond, both pre- and post-disaster, in such a way as to save lives, to preserve property; and to maintain the ecological, economic, and political stability of the impacted region." (Pearce 2000, Chapter 5, p. 6)

**Disaster Management:** The body of policy and administrative decisions and operational activities which pertain to the various stages of a disaster at all levels. (UN 1992, 22)

**Disaster, Natural:** "'Natural' disasters have more to do with the social, political, and economic aspects of society than they do with the environmental hazards that trigger them. Disasters occur at the interface of vulnerable people and hazardous environments" (Bolin with Stanford 1998, Preface).

**Disaster, Natural:**"While human actions generally cannot cause an earthquake in the sense of doing something to provoke fault movement, they are often critically involved in the disaster that can follow a seismic event. In that sense then, 'natural' is an inappropriate adjective to describe such disasters (Hewitt 1997) " (Bolin with Stanford 1998, 4).

**Disaster, Natural:** Any hurricane, tornado, storm, flood, high water, wind-driven water, tidal wave, tsunami, earthquake, volcanic eruption, landslide, mudslide, snowstorm, drought, fire, or other catastrophe in any part of the United States which causes, or which may cause, substantial damage or injury to civilian property or persons. (Robert T. Stafford Act, 602)

**Disaster, Natural:**"In a seeming inversion of what was 'obvious' about natural disasters, a view has been developed by such geographers as Hewitt that seeks explanations of disaster primarily in the sociocultural and economic features of the societies that are variously affected by natural forces. Their focus has been to develop an understanding of the social structures and material practices that made people more or less vulnerable to environmental hazards. In this approach, the underlying causes of disaster are to be found not in nature, but in the organization of human societies (Varley 1994 )" (Bolin with Stanford 1998, 5).

**Disaster Preparedness Improvement Grant Program (DPIG):** Authorized under Section 201 of the Stafford Act. Annual matching awards are provided to States to improve or update their disaster assistance plans and capabilities.

**Disaster Relief Act of 1974:** A Federal statute designed to supplement the efforts of the affected States and local governments in expediting the rendering of assistance, emergency services, and the reconstruction and rehabilitation of devastated areas (PL 93-288), as amended. (FEMA Instruction 5000.2)

**Disaster Response:** A sum of decisions and actions taken during and after disaster, including immediate relief, rehabilitation, and reconstruction. (U.N. 1992, 3)

**Disaster Risk Management:** "Disaster risk management and reduction are about looking beyond hazards alone to considering prevailing conditions of vulnerability. It is the social, cultural, economic, and political setting in a country that makes people vulnerable to unfortunate events. The basis of this understanding is simple: the national character and chosen form of governance can be as much of a determinant in understanding the risks in a given country, as are the various social, economic and environmental determinants." (U.N. ISDR 2002, 27)

**Disaster Risk Reduction:** "The systematic development and application of policies, strategies and practices to minimize vulnerabilities and disaster risks throughout a society, to avoid (prevention) or to limit (mitigation and preparedness) adverse impact of hazards, within the broad context of sustainable development." (U.N. ISDR 2002, 25)

**Disaster, Technological:** ". . . technological disasters - meaning everything that can go wrong when systems fail, humans err, designs prove faulty, engines misfire, and so on." (Erikson, 1989, 141)

**Disaster, Technological:** "Miller and Fowlkes (1984) have argued that the term 'technological disaster' renders such events too impersonal in origin. They believe that such 'accidents' are due mainly to the excessive priority given to industrial profits and advocate the term 'man-made disaster' to indicate corporate responsibility" (Smith 1997, 14).

**Domestic Emergency:** "Any natural disaster or other emergency that does not seriously endanger national security, but which is of such a catastrophic nature that it cannot be managed effectively without substantial Federal presence, or which arises within spheres of activity in which there is an established Federal role." (FEMA Disaster Dictionary 2001, 36; cites Domestic Emergencies Handbook, US Army Forces Command, March 15, 1999).

**Domestic Emergency Support Team (DEST):** "Relative to terrorism incident operations, an organization formed by the Federal Bureau of Investigation (FBI) to provide expert advice and assistance to the FBI On-Scene Commander (OSC) related to the capabilities of the DEST agencies and to coordinate follow-on response assets. When deployed, the DEST merges into the existing Joint Operations Center (JOC) structure." (FEMA Disaster Dictionary 2001, 36; cites FEMA FRP, "Terrorism Incident Annex")

**Drought:** (1) Prolonged absence or marked deficiency of precipitation. (2) period of abnormally dry weather sufficiently prolonged for the lack of precipitation to cause a serious hydrological imbalance. (WMO 1992, 198)

## E

**Ecological Disaster:** See, "Disaster, Ecological"

**El Niño:** An anomalous warming of ocean water resulting from the oscillation of a current in the South Pacific, usually accompanied by heavy rain fall in the coastal region of Peru and Chile, and reduction of rainfall in equatorial Africa and Australia. (U.N. 1992, 26)

**Emergency:** "An unexpected event which places life and/or property in danger and requires an immediate response through the use of routine community resources and procedures. Examples would be a multi-automobile wreck, especially involving injury or death, and a fire caused by lightning strike which spreads to other buildings." Emergencies can be handled with local resources. (Drabek 1996, Session 2, p. 3)

**Emergency:** Any hurricane, tornado, storm, flood, highwater, wind-driven water, tidal wave, tsunami, earthquake, volcanic eruption, landslide, mudslide, snowstorm, drought, fire, explosion, nuclear accident, or other natural or manmade catastrophe in any part of the United States. Any occasion or instance for which, in the determination of the President, Federal assistance is needed to supplement State and local efforts and capabilities to save lives and to protect property and public health and safety or to lessen the threat of a catastrophe in any part of the United States. (FEMA 1990)

**Emergency:** "Any occasion or instance for which, in the determination of the President, Federal assistance is needed to supplement State and local efforts to save lives and to protect property and public health and safety, or to lessen or avert the threat of a catastrophe in any part of the United States. The Governor of a State, or the Acting Governor in his/her absence, may request that the President declare an emergency when an incident occurs or threatens to occur in a State which would not qualify under the definition of a major disaster. Assistance authorized by an emergency declaration is limited to immediate and short-term assistance, and may not exceed \$5 million, except when authorized by the FEMA Associate Director for Response and Recovery under certain conditions." (FEMA Disaster Dictionary 2001, 39; cites Robert T Stafford Act 102; 44 CFR 206.2, 206.35; 206.63, 206.66, and 503)

**Emergency:** "Any event requiring increased coordination or response beyond the routine in order to save lives, protect property, protect the public health and safety, or lessen or avert the threat of a disaster." (Michigan EMD 1998, 6)

**Emergency:** A more serious situation than an incident, but less serious than a disaster. (Oxford Canadian Dictionary, 1998; noted by Pearce 2000, Chapter 2, 2)

**Emergency:** ". . .an unexpected occurrence or sudden situation that requires immediate action. . .It may involve communities (as a disaster does) or individuals (which a disaster does not). . ." (Porfiriev 1995, 291).

**Emergency:** An event in which established emergency organizations (such as the American Red Cross or utilities) need to expand their activities. (Quarantelli 1987, 25.)

**Emergency:** An extraordinary situation in which people are unable to meet their basic survival needs, or there are serious and immediate threats to human life and well being. An emergency situation may arise as a result of a disaster, a cumulative process of neglect or environmental degradation, or when a disaster threatens and emergency measures have to be taken to prevent or at least limit the effects of the eventual impact. (Simeon Institute 1998)

**Emergency:** ". . .a sudden critical juncture demanding immediate remedial action." (Terry 2001, 327)

**Emergency:** A sudden and usually unforeseen event that calls for immediate measures to minimize its adverse consequences. (U.N. 1992, 26)

**Emergency Assistance:** Assistance which may be made available under an emergency declaration. In general, Federal support to State and local efforts to save lives, protect property and public health and safety, and lessen or avert the threat of a catastrophe. Federal emergency assistance may take the form of coordinating all disaster relief assistance (including voluntary assistance) provided by Federal agencies, private organizations, and State and local governments. Or , the Federal government may provide technical and advisory assistance to affected State and local governments for: the performance of essential community services; issuance of warnings of risks or hazards; public health and safety information, including dissemination of such information; provision of health and safety measures; management, control, and reduction of immediate threats to public health and safety; debris removal; temporary housing; and distribution of medicine, food, and other consumable supplies. (Stafford Act )

**Emergency Management:** The entire process of planning and intervention for rescue and relief to reduce impact of emergencies as well as the response and recovery measures, to mitigate the significant social, economic and environmental consequences to communities and ultimately to the country, usually through an emergency operation center, EOC. (Disaster and Emergency Reference Center 1998)

**Emergency Management:** The process by which the uncertainties that exist in potentially hazardous situations can be minimized and public safety maximized. The goal is to limit the costs of emergencies or disasters through the implementation of a series of strategies and tactics reflecting the full life cycle of disaster, i.e., preparedness, response, recovery, and mitigation. (Drabek1997)

**Emergency Management:**"Emergency management is the discipline and profession of applying science, technology, planning, and management to deal with extreme events that can injure or kill large numbers of people, do extensive damage to property, and disrupt community life." (Drabek and Hoetmer 1991, xvii).

**Emergency Management:** Organized analysis, planning, decision-making, and assignment of available resources to mitigate (lessen the effect of or prevent) prepare for, respond to, and recover from the effects of all hazards. The goal of emergency management is to save lives, prevent injuries, and protect property and the environment if an emergency occurs. (FEMA 1995, I-6).

**Emergency Management:**"The process through which America prepares for emergencies and disasters, responds to them, recovers from them, rebuilds, and mitigates their future effects." (FEMA Disaster Dictionary 2001, 40, citing FEMA Strategic Plan)

**Emergency Management:** "A Comprehensive system of policies, practices, and procedures designed to protect people and property from the effects of emergencies or disasters. It includes programs, resources, and capabilities to mitigate against, prepare for, respond to, and recover from effects of all hazards." (Michigan DEM 1998, 6)

**Emergency Management:** A range of measures to manage risks to communities and the environment. It involves the development and maintenance of arrangements to prevent the effect of, prepare for, respond to or recover from events causing significant community disruption or environmental damage. (Salter 1997-98, 28)

**Emergency Management:** The organization and management of resources for dealing with all aspects of emergencies. Emergency management involves the plans, structures and arrangements which are established to bring together the normal endeavors of government, voluntary and private agencies in a comprehensive and coordinated way to deal with the whole spectrum of emergency needs including prevention, response and recovery. (Victorian Department of Justice 1997)

**Emergency Manager:** The person who has the day-to-day responsibility for emergency management programs and activities. The role is one of coordinating all aspects of a jurisdiction's mitigation, preparedness, response, and recovery capabilities.

(The local emergency management position is referred to with different titles across the country, such as civil defense coordinator or director, civil preparedness coordinator or director, disaster services director, and emergency services director.)

**Emergency Manager:** "Emergency managers are professionals who practice the discipline of emergency management by applying science, technology, planning and management techniques to coordinate the activities of a wide array of agencies and organizations dedicated to preventing and responding to extreme events that threaten, disrupt, or destroy lives or property." (Drabek 2002, Student Handout 1-2)

**Emergency Operations Plan (EOP):** An all-hazards document that specifies actions to be taken in the event of an emergency or disaster event; identifies authorities, relationships, and the actions to be taken by whom, what, when, and where, based on predetermined assumptions, objectives, and existing capabilities.

**Emergency Preparedness:** Activities and measures designed or undertaken to prepare for or minimize the effects of a hazard upon the civilian population, to deal with the immediate emergency conditions which would be created by the hazard, and to effectuate emergency repairs to, or the emergency restoration of, vital utilities and facilities destroyed or damaged by the hazard. (Stafford Act)

**Emergency Public Information:** Information which is disseminated primarily in anticipation of an emergency or at the actual time of an emergency and in addition to providing information as such, frequently directs actions, instructs, and transmits direct orders. (Simeon Institute 1998)

**Emergency Risk Management:** "Emergency risk management is a 'systematic process that produces a range of measures that contribute to the well-being of communities and the environment'. It includes: context definition; risk identification; risk analysis; risk evaluation; risk treatment; monitoring and reviewing; and, communicating and consulting." (Emergency Management Australia 2000, 1)

**Emergency Support Services:** The departments of local government that have the capability to respond to emergencies 24 hours a day. They typically include law enforcement, fire, rescue, and public works. They may also be referred to as emergency response personnel or emergency operating forces.

**Exposure:** "Exposure describes the number of people, and the value of structures and activities that will experience. . . hazards and may be adversely impacted by them." (Darlington and Lambert 2001, 135)

**Exposure:** "People, property, systems, or functions at risk of loss exposed to hazards." (Multihazard Mitigation Council, 2002, 30)

**Extreme Events:** An extreme event in the context of the natural world is an act of nature, "such as a lightning stroke or a flood [that] may be a productive resource and a hazard at the same time. Lightning may kill an animal but also start a fire essential to the preservation of a forest ecosystem. A flood may destroy a farmstead while fertilizing the fields" (Burton et al. 1993, 34).

## F

**Federal Radiological Emergency Response Plan (FRERP):** The plan used by Federal agencies to respond to a radiological emergency, with or without a Stafford Act declaration. Without a Stafford Act declaration, Federal agencies respond to radiological emergencies using the FRERP, each agency in accordance with existing statutory authorities and funding resources. The Lead Federal Agency has responsibility for coordination of the overall Federal response to the emergency. FEMA is responsible for coordinating non-radiological support using the structure of the Federal Response Plan. When a major disaster or emergency is declared under the Stafford Act and an associated radiological emergency exists, the functions and responsibilities of the FRERP remain the same. The Lead Federal Agency coordinates the management of the radiological response with the Federal Coordinating Officer. Although the direction of the radiological response remains the same with the Lead Federal Agency, the FCO has the overall responsibility for coordination of Federal assistance in support of State and local governments using the Federal Response Plan. (FRERP)

**Federal Response Plan (FRP):** 1) The plan designed to address the consequences of any disaster or emergency situation in which there is a need for Federal assistance under the authorities of the Robert T. Stafford Disaster Relief and Emergency Assistance Act, 42 U.S.C. 5121 et seq. 2) The FRP is the Federal government's plan of action for assisting affected States and local jurisdictions in the event of a major disaster or emergency. As the implementing document for the Stafford Act, the FRP organizes the Federal response by grouping potential response requirements into 12 functional categories, called Emergency Support Functions. The FRP was completed in April 1992, and 29 Federal departments and agencies are signatories to the plan. (FRERP)

**Five-Hundred Year Floodplain (or 0.2 percent chance floodplain):** That area which includes the base floodplain which is subject to inundation from a flood having a 0.2 percent chance of being equalled or exceeded in any given year.

**Flash Flood:** A flood that crests in a short period of time and is often characterized by high velocity flow—often the result of heavy rainfall in a localized area.

**Forecast:** Statement or statistical estimate of the occurrence of a future event. This term is used with different meanings in different disciplines, as well as "prediction". (U.N. 1992, 4)

**The Four Phases:** Mitigation, Preparedness, Response and Recovery.

**Fujita-Pearson Scale (FPP Scale):** A 3-digit scale for tornadoes devised by Fujita (F scale) and Pearson (PP scale) to indicate the tornado intensity (0-5), path length (0-5), and path width (0-7) (WMO 1992).

**Fujita Tornado Scale:** A scale for expressing the relative intensity of tornadoes, consisting of six levels corresponding to increasing levels of damage - light, moderate, considerable, severe, devastating, incredible. (Notification Manual)

## G

**Gale:** Wind with a speed between 34 and 40 knots. (U.N. 1992)

**Geographic Information System (GIS):** A computerised database for the capture, storage, analysis and display of locationally defined information. Commonly, a GIS portrays a portion of the earth's surface in the form of a map on which this information is overlaid. (EM Australia 1995)

## H

**Hazard:** "A Hazard is a natural, technological or social phenomenon that poses a threat to people and their surroundings (in terms of both the natural and the built environment)." (Alexander, No Date, 1)

**Hazard:** Some, including not just a few emergency managers, view hazards such as earthquakes as "technical problems suitable for a combination of engineering, planning, and specialized managerial solutions, and people, if they are mentioned at all, are seen largely as impediments to carrying out the technocratic solutions, because they fail to see the risks they face (e.g. Mileti and Fitzpatrick 1993). . . . However, by concentrating on the physical risks, projected extreme events, and worst case scenarios, much is ignored" (Bolin with Stanford 1998, 20).

**Hazard:** "is a source of risk and refers to a substance or action that can cause harm." (Cohrssen & Covello 1989)

**Hazard:** "Hazard refers to an extreme natural event that poses risks to human settlements" (Deyle, French, Olshansky, and Paterson 1998, 121).

**Hazard:** Dangerous natural or man made phenomenon that expose a vulnerable location to disastrous events. Vulnerability reduction aims at neutralizing the dangers posed by the hazard. (D&E Reference Center 1998)

**Hazard:** "Hazard means 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, xxi).

**Hazard:** "Relevant to emergency preparedness, a hazard is an emergency or disaster resulting from a natural disaster, or an accidental or man-caused event." (FEMA Disaster Dictionary 2001, 58, citing Robert T. Stafford Act, 602)

**Hazard:** Hazards "are threats to humans and what they value: life, well-being, material goods, and environment." (Harriss et al, 1978)

**Hazard:** Hazard is the probability that in a given period in a given area, an extreme potentially damaging natural phenomena occurs that induces air, earth or water movements, which affect a given zone. The magnitude of the phenomenon, the probability of its occurrence and the extent of its magnitude can vary and, in some cases, be determined. (Maskrey 1989, 1)

**Hazard:** "A dangerous event or circumstance that has the potential to lead to an emergency or disaster. Any physical phenomenon that has the potential to produce harm or other undesirable consequences to some person or thing." (May, p. 5)

**Hazard:** "Hazard. . . reflects a potential threat to humans as well as the impact of an event on society and the environment. . . hazards are. . . in part socially constructed by people's perceptions and their experiences. Moreover, people contribute to, exacerbate, and modify hazards. Thus, hazards can vary by culture, gender, race, socioeconomic status, and political structure as well" (Mitchell and Cutter 1997, 9-10).

**Hazard:** "A hazard can be defined as: 'some aspect of the physical environment that threatens the well-being on individuals and their society.'" (Nigg 1996, 4)

**Hazard:** "In disaster management, a hazard refers to the potential for a disaster." (Pearce 2000, Chapter

**Hazard:** Involves identifying all of the hazards that potentially threaten a jurisdiction and analyzing them in the context of the jurisdiction to determine the degree of threat that is posed by each. (FEMA 1997)

**Hazard:** "A hazards analysis consists of two parts. The first involves knowledge of the kinds of hazards that might threaten the community. This knowledge includes the probability of the event occurring at varying levels of intensity and at varying locations throughout the community. Determinations of probability, intensity, and location can be made on the basis of historical evidence, empirical research, or community perception." (McLoughlin 1985, 168)

**Hazard Analysis:** "The identification and evaluation of all hazards that potentially threaten a jurisdiction to determine the degree of threat that is posed by each." (Michigan DEM 1998, 6)

**Hazard Analysis:** That part of the overall planning process which identifies and describes hazards and their effects upon the community. (NDO 1992)

**Hazard Assessment:** Identification of hazards in given location. (D&E Reference Center 1998)

**Hazard Assessment:** (Sometimes Hazard Analysis/Evaluation) The process of estimating, for defined areas, the probabilities of the occurrence of potentially-damaging phenomenon of given magnitudes within a specified period of time. Hazard assessment involves analysis of formal and informal historical records, and skilled interpretation of existing topographical graphical, geological geomorphological, hydrological, and land-use maps. (Simeon Institute 1998)

**Hazard, Environmental:** ". . .the threat potential posed to man or nature by events originating in, or transmitted by, the natural or built environment" (Kates 1978, 14).

Keith Smith's (1997, 14-15) commentary on this definition:

"This definition can include both long-term environmental deterioration (acidification of soils, build-up of atmospheric carbon dioxide) and all the social hazards, both involuntary and communal (crime, terrorism, warfare), as well as voluntary and personal hazards (drug abuse, mountain climbing). These hazards have such different origins and impacts that a more focused definition is required."

**Hazard, Environmental:** "events which directly threaten human life and property by means of acute physical or chemical trauma. . .Any manageable definition of environmental hazards will be both arbitrary and contentious. But, despite their diverse sources, most disasters have a number of common features:

1. The origin of the damaging process or event is clear and produces characteristic threats to human life or well-being, e.g. a flood causes death by drowning.
2. The warning time is normally short, i.e. the hazards are often known as rapid-onset events. This means that they can be unexpected even though they occur within a known hazard zone, such as the floodplain of a small river basin.
3. Most of the direct losses, whether to life or property, are suffered fairly shortly after the event, i.e., within days or weeks.
4. The exposure to hazard, or assumed risk, is largely involuntary, normally due to the location of people in a hazardous area, e.g. the unplanned expansion of some Third World cities onto unstable hillslopes.
5. The resulting disaster occurs with an intensity that justifies an emergency response, i.e. the provision of specialist aid to the victims. The scale of response can vary from local to international" (Smith 1996, 15-16).

**Hazard, Environmental:** ". . .extreme geophysical events, biological processes and major technological accidents, characterized by concentrated releases of energy or materials, which pose a largely

unexpected threat to human life and can cause significant damage to goods and the environment" (Smith 1996, 16).

**Hazard, Global:** ". . .changes to regional ecosystems which in turn effect global systems, are termed 'global hazards'. Climate change, soil degradation, and deforestation are examples of global hazards that are directly and indirectly related to the manipulation of technology. Global hazards can be distinguished from the more traditional ones because of their diffused or dispersed effects at the planetary scale-they threaten the long-term survival of t he planet. . . .They are not rare, discrete events but develop over a long period of time. Global hazards are cumulative in nature and are the end result of centuries or decades of human manipulation of technology to control nature and exploit its resources" (Cutter 1993, 5).

**Hazard Identification:** A structured approach for identifying those hazards judged by local officials to pose a significant threat to their jurisdiction.

**Hazard Identification:**. . .defines the magnitudes (intensities) and associated probabilities (likelihoods) of natural hazard that may pose threats to human interests in specific geographic areas. (Deyle, French, Olshansky and Patterson 1998, 121).

**Hazard Identification:**". . .the process of defining and describing a hazard, including its physical characteristics, magnitude and severity, probability and frequency, causative factors, and locations/areas affected" (FEMA 1997, Multi Hazard. . .Assessment, xxi).

**Hazard Identification:** Hazard Identification locates hazardous areas, often estimates the probability of hazardous events of various magnitudes, and sometimes assesses the separate characteristics of the hazards (e.g., for hurricanes: wind, high water, and wave action). (Godschalk, Kaiser, and Berke, 1998, 98)

**Hazard Identification:** The process of recognizing that a hazard exists and defining its characteristics (Standards 1995).

**Hazard Management:** ". . .utilizes individual and collective strategies to reduce and mitigate the impacts of hazards on people and places" (Cutter 1993, 2).

**Hazard Mitigation:** Any measure that will reduce the potential for damage from a disaster event.

**Hazard Mitigation:** Measures taken in advance of a disaster aimed at decreasing or eliminating its impact on society and environment (U.N. 1992, 41).

**Hazard, Natural:** ". . .a naturally occurring or man-made geologic condition of phenomenon that presents a risk or is a potential danger to life or property" (American Geological Institute 1984). (Quoted in Tobin and Montz 1997, 9).

**Hazard, Natural:**"The concept of natural hazards is somewhat paradoxical; the elements of a natural geophysical event (e.g., wind and storm surge of a hurricane) are hazardous only when they prove detrimental to human activity systems" (Baker 1976, 1).

**Hazard, Natural:**"While some hazards, such as earthquakes and volcanoes, are the product of natural processes unmodified by human interventions, other ostensibly natural hazards are less and less 'natural'. The impacts of human activities on global climatic systems, with attendant changes in rainfall patters, storm frequency, and storm severity suggest that meteorological hazards themselves could be influenced by (unintended) human factors (e.g. Southwick 1996 ; Flavin 1997 ). Flavin (1997) cites evidence that both the frequency and severity of meteorological hazards may be increasing as a result of human-induced climatic change. Similarly human modifications of riverine systems, from deforesting and

paving watersheds to elaborate levee systems, have taken the 'natural' out of many flood hazards (e.g. Smith 1996)" (Bolin with Stanford 1998, 25 fn. 3).

**Hazard, Natural:**"In reality, the environment is neither benign nor hostile. In is 'neutral' and it is only human location, actions and perceptions which identify resources and hazards within the range of natural events (Burton et al. 1993)" (Smith 1996, 12).

**Hazard, Natural:**" . . .those elements of the physical environment harmful to man and caused by forces extraneous to him" (Smith 1996, 9: quoting I. Burton and R.W. Kates. "The Perception of Natural Hazards in Resource Management." *Natural Resources Journal*, Vol.3, 1964, pp. 412-441).

**Hazard, Natural:**"Natural hazards exist with or without the presence of human populations and development" (Schwab, et al. 1998, 12).

**Hazard, Natural:**"A natural hazard represents the potential interaction between humans and extreme natural events. . .It represents the potential or likelihood of an event (it is not the event itself)" (Tobin & Montz 1997, 5).

"Natural hazards constitute a complex web of physical and environmental factors interacting with the social, economic, and political realities of society" (Tobin and Montz 1997, 11).

**Hazard, Natural:** Naturally caused events such as hurricanes, tornadoes, earthquakes, floods, volcanoes and forest fires. (Unknown source)

**Hazard, Natural:**"First, the misunderstanding of 'natural hazards' as events unrelated to or separate from human activity and human choice is no longer credible. The fundamental involvement of human organizations, cultural and institutional context, and political-economic structures cannot be overlooked or wished away. The creation, distribution, and mitigation of vulnerability to hazards of all kinds is a social interaction with either other social processes or geophysical processes or both. There is no purely 'natural' hazard in the full sense of a risk or danger for which affected persons have no defence or remedy." (Weiner 2001, 1)

**Hazard Probability:** The estimated likelihood that a hazard will occur in a particular area.

**Hazard Risk:** The probability of experiencing disaster damage.

**Hazard, Technological:** Typically man-related hazards such as nuclear power plant accidents, industrial plant explosions, aircraft crashes, dam breaks, mine cave-ins, pipeline explosions and hazardous material accidents. (Unknown source)

**Hazard, Technological:** A range of hazards emanating from the manufacture, transportation, and use of such substances as radioactive materials, chemicals, explosives, flammables, agricultural pesticides, herbicides, and disease agents; oil spills on land, coastal waters, or inland water systems; and debris from space. (FEMA 1992, FRP Appendix B)

**Hazard, Technological:** Technological hazards are best seen as accidental failures of design or management affecting large-scale structures, transport systems or industrial activities which present life-threatening risks to the local community. . .the failure "trigger" which provokes a technological disaster is likely to arise for one of the following reasons: (1) defective design; (2) inadequate management; (3) sabotage or terrorism (Smith 1996, 316).

**Hazard Vulnerability:** The susceptibility of life, property, or the environment to damage if a hazard occurs.

**Hazardous Material (HAZMAT):** Any material which is explosive, flammable, poisonous, corrosive, reactive, or radioactive (or any combination), and requires special care in handling because of the hazards posed to public health, safety, and/or the environment. (Firescope 1994)

**Heat Wave:** Marked warming of the air, or the invasion of very warm air, over a large area; it usually lasts from a few days to a few weeks. (WMO 1992, 294)

**Human-Made Disasters:** are disasters or emergency situations where the principal, direct cause(s) are identifiable human actions, deliberate or otherwise. Apart from "technological" and "ecological" disasters, this mainly involves situations in which civilian populations suffer casualties, losses of property, basic services and means of livelihood as a result of war or civil strife, for example: Human-made disasters/emergencies can be of the rapid or slow onset types, and in the case of internal conflict, can lead to "complex emergencies" as well. Human-made disaster acknowledges that all disasters are caused by humans because they have chosen, for whatever reason, to be where natural phenomena occurs that result in adverse impacts of people. This mainly involves situations in which civilian populations suffer casualties, losses of property, basic services and means of livelihood as a result of war, civil strife, or other conflict. (Simeon Institute)

**Hydrology:** Science that deals with the waters above and below the land surfaces of the Earth, their occurrence, circulation and distribution, both in time and space, their biological, chemical and physical properties, their reaction with their environment, including their relation to living beings. (WMO 1992, 306)

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**Incident:** An event, accidentally or deliberately caused, which requires a response from one or more of the statutory emergency response agencies. (Australian Fire Authorities Glossary 1996)

**Incident:** "Any condition that meets the definition of major disaster or emergency which causes damage or hardship that may result in a Presidential declaration of a major disaster or an emergency." (FEMA Disaster Dictionary 2001, 62-63, citing Title 44 CFR 206.32)

**Incident:** "Under the ICS concept, an incident is an occurrence, either human-caused or by natural phenomena, that requires action by emergency service personnel to prevent or minimize loss of life or damage to property and/or natural resources." (FEMA Disaster Dictionary 2001, 62-63, citing National Wildfire Coordinating Group, Incident Command System, National Training Curriculum, ICS Glossary (PMS 202, NFES #2432), October 1994)

**Incident:** A minor situation. (Oxford Canadian Dictionary, 1998)

**Incident Command System (ICS):** The combination of facilities, equipment, personnel, procedures, and communications operating within a common organizational structure with responsibility for management of assigned resources to effectively direct and control the response to an incident. Intended to expand as the situation requires greater resources without requiring new, reorganized, command structures.

**Incident Command System (ICS):** A standardized on-scene emergency management concept specifically designed to allow it's users to adopt an integrated organizational structure equal to the complexity and demands of single or multiple incidents, without being hindered by jurisdictional boundaries. (NWCG 1994)

**Incident Commander (IC):** ICS term for the person, usually from the local jurisdiction, who is responsible for overall management of an incident. On most incidents, the command activity is carried out by a single IC. The IC may be assisted by a deputy from the same agency or from an assisting agency. (FEMA 1993)

**Individual and Family Grant (IFG) Program:** A program through which the Federal government makes a grant to a State for the purpose of making grants to individuals and families adversely affected by a major disaster. Individual and family grants are intended to meet disaster-related necessary expenses or serious needs in those cases where such individuals or families are unable to meet their expenses or needs through assistance under other provisions of the Stafford Act or through other means. (Stafford Act)

**Individual Assistance:** Supplementary Federal assistance provided pursuant to a Presidential Declaration of emergency or major disaster under the Stafford Act to individuals and families adversely affected. Such assistance may be provided directly by the Federal Government or through State or local governments or disaster relief organizations.

**Integrated Emergency Management System (IEMS):** A strategy for implementing emergency management activities which builds upon those functions common to preparedness for any type of occurrence and provides for special requirements of individual emergency situations.

**Intensity:** . . .refers to the damage-generating attributes of a hazard. For example, water depth and velocity are commonly used measures of the intensity of a flood. For hurricanes, intensity typically is characterized with the Saffir/Simpson scale, which is based on wind velocity and storm surge depths. . .The absolute size of an earthquake is given by its Richter magnitude (and other similar magnitude scales), but its effects in specific locations are described by the Modified Mercalli Intensity (MMI) Scale. . .Earthquake intensity is also ascertained by physical measures such as peak ground acceleration (expressed as a decimal fraction of the force of gravity, e.g., 0.4 g), peak velocity, or spectral response, which characterizes the frequency of the energy content of the seismic wave. (Deyle, French, Olshansky, and Paterson 1998, 124.)

## L

**La Niña:** The opposite of an El Niño event, during which waters in the west Pacific are warmer than normal, trade winds or Walker circulation is stronger and, consequently, rainfalls heavier in Southeast Asia. (Bryant 1991)

**Lightning:** Luminous manifestation accompanying a sudden electrical discharge which takes place from or inside a cloud or, less often, from high structures on the ground or from mountains. (WMO 1992, 358)

## M

**Major Disaster:** Any natural catastrophe (including any hurricane, tornado, storm, high water, wind-driven water, tidal wave, tsunami, earthquake, volcanic eruption, landslide, mudslide, snowstorm, or drought) or, regardless of cause, any fire, flood, or explosion, in any part of the United States, which, in the determination of the President, causes damage of sufficient severity and magnitude to warrant major disaster assistance under the Stafford Act to supplement the efforts and available resources of States, local governments, and disaster relief organizations in alleviating the damage, loss, hardship, or suffering caused thereby. (Robert T. Stafford Act 102; 44 CFR 206.2 and 206.36)

**Management:** Management consists of decision-making activities undertaken by one or more individuals to direct and coordinate the activities of other people in order to achieve results that could not be accomplished by any one person acting alone. Effective management focuses on group effort, various forms of coordination, and the manner of making decisions. Management is required whenever two or more persons combine their efforts and resources to accomplish a goal that cannot be accomplished by acting alone. Coordination is necessary when the actions of group participants constitute parts of a total task. If one person acts alone to accomplish a task, no coordination may be required; but when that person delegates a part of the task to others, the individual efforts must be coordinated. (Unknown source)

**Mass Emergency:** "An unexpected or undesirable event which requires the resources from most of all municipal departments and limited assistance from outside agencies may be needed." (Drabek 1996, Session 2, p. 3)

**Military Support to Civil Authorities (MSCA):** Those activities and measures taken by Department of Defense components to foster mutual assistance and support between DoD and any civil government agency in planning or preparedness for, or in the application of resources for response to, the consequences of civil emergencies or attacks, including national security emergencies. MSCA is described in DoD Directive 3025.1. The Secretary of the Army is designated as the DoD executive agent for MSCA. (Title 32 CFR 185)

**Mitigate:** To lessen in force or intensity. This definition does not preclude "Lessening to Zero" when mitigation or to mitigate are used in relation to hazards that could cause or contribute to a peacetime civil emergency. (FEMA 1990)

**Mitigation:** ". . . mitigation is the social attempt to reduce the occurrence of a disaster, to reduce the vulnerability of certain populations, and to more equitably distribute the costs within the society." (Dynes 1993, 179)

**Mitigation:** Those activities designed to alleviate the effects of a major disaster or emergency or long-term activities to minimize the potentially adverse effects of future disaster in affected areas. (FEMA 1990)

**Mitigation:** ". . . sustained action taken to reduce or eliminate long-term risk 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" (FEMA 1997, Multi Hazard. . . , xxii).

**Mitigation:** "Any action taken to eliminate or reduce the long-term risk to human life and property from natural hazards. Mitigation actions are accomplished by:

- Acting on the hazard. Seeding hurricanes or triggering avalanches may eliminate a hazard before a disaster occurs.
- Redirecting the hazard. A seawall or dune restoration program helps keep water away from people by redirecting the impact areas away from vulnerable locations.
- Interacting with the hazard. Seismic safety provisions incorporated into building codes result in structures that are more able to withstand impacts and earthquakes.
- Avoiding the hazard. River corridor projects create multiple beneficial uses of the floodplain while relocating structures to less vulnerable locations." (FEMA IS-513, 1999, I-50)

**Mitigation:** In its simplest sense, mitigation is risk management. It is a term that we at FEMA use to describe actions that can be taken at the individual, local, State and Federal levels to reduce the overall risk from natural disasters. It is getting a handle on the costs of disasters in our society, including not only moneys, but also suffering and economic disruptions. (Krimm 1998)

**Mitigation:** "Activities that reduce the degree of long-term risk to human life and property from natural and man-made hazards; e.g., building codes, disaster insurance, land-use management, risk mapping, safety codes, and tax incentives and disincentives." (McLoughlin 1985, 166)

"Mitigation consists of planned and orderly efforts to prevent hazards that are preventable and lessen the impact of those that are not. Mitigation activities can act in three ways to prevent or reduce effects of potential hazards. First, they can act on the hazard to eliminate it or to reduce the frequency and

intensity of its occurrence. Second, they can change the way a hazard interacts with people and their support systems. Third, they can alter the way people live and the systems they create." (McLoughlin 1985, 170)

**Mitigation:** Action to reduce the effects of a disaster on a population. (Nimpuno, 1998)

**Mitigation:** ". . .mitigation is seen as prevention - stopping a negative event before it happens." (Peterson and Perry 1999, 242)

**Mitigation:** Measures taken in advance of a disaster aimed at decreasing or eliminating its impact on society and on environment. (U.N. 1992, 4)

**Modified Mercalli Intensity Scale:** A measure of the effects of an earthquake in a specific location. (Deyle, French, Olshansky, and Paterson 1998, 124)

**Modified Mercalli Intensity Scale:** (Jaffe, Buffer, and Thurow 1981)

Intensity Detectability/Level Impact

I Detected only by sensitive instruments

II Felt by a few persons at rest, especially on upper floors

III Felt noticeably indoors, but not always recognized as a quake

IV Felt indoors by many, outdoors by a few

V Felt by most people, damage to glass and plaster

VI Felt by all, many frightened and run outdoors, damage small

VII Everybody runs outdoors, damage to buildings varies

VIII Panel walls thrown out of frames, fall of walls and chimneys

IX Buildings shifted off foundations, cracked, thrown out of plumb

X Most masonry and framed structures destroyed, ground cracked

XI New structures still standing, bridges destroyed, ground fissures

XII Damage total, waves seen on ground surface

## N

**National Disaster Medical System (NDMS):** A federally coordinated initiative to augment the nation's emergency medical response capability by providing medical assets to be used during major disasters or emergencies. NDMS has three major components: Disaster Medical Assistance Teams and Clearing-Staging Units to provide triage, patient stabilization, and austere medical services at a disaster site; an evacuation capability for movement of patients from a disaster area to locations where definitive medical care can be provided; and a voluntary hospital network to provide definitive medical care. NDMS is administered by the Department of Health and Human Services/U.S. Public Health Service, in cooperation with the Department of Defense, the Department of Veterans Affairs, FEMA, State and local governments, and the private sector. (Facts on the NDMS)

**National Security Emergency:** "Any occurrence, including natural disaster, military attack, technological emergency, or other emergency, that seriously degrades or seriously threatens the national security of the United States." (FEMA Disaster Dictionary 2001, 84; cites Executive Order 12656)

**National Voluntary Organizations Active in Disasters (NVOAD):** An umbrella organization of established and experienced voluntary organizations that serve disaster-affected communities. (FEMA 1995)

## O

**One-Hundred Year (100-Year) Floodplain:** The land area adjoining a river, stream, lake, or ocean which is inundated by the 100-year flood, also referred to as a flood having a 1 percent chance of occurring in any given year. The 100-year flood is the regulatory (base) flood under the NFIP. (FEMA 1990)

## P

**Plume:** Identifiable stream of air with a temperature or composition different from that of its environment. Examples are a smoke plume from a chimney and a buoyant plume rising by convection from heated ground. (WMO 1992, 456)

**Preliminary Damage Assessment (PDA):** A process used to determine the impact and magnitude of damage and the resulting unmet needs of individuals, businesses, the public sector, and the community as a whole. Information collected as a result of the PDA process is used by the State as a basis for the Governor's request for Federal assistance under the Stafford Act, and by FEMA to document the recommendation made to the President in response to the Governor's request. (44 CFR 206.33)

**Preparedness:** Those activities, programs, and systems that exist prior to an emergency that are used to support and enhance response to an emergency or disaster. (FEMA 1992)

**Preparedness:** Establishing and delineating authorities and responsibilities for emergency actions and making provisions for having the people, equipment, and facilities in place to respond when the need arises. Preparedness involves planning, training, exercising, procuring and maintaining equipment, and designating facilities for shelters and other emergency purposes. (Michigan DEM, 1998, 7)

**Preparedness:** "Preparedness represents actions that are undertaken to reduce the negative consequences of events where there is insufficient human control to institute mitigation measures." (Peterson and Perry 1999, 242)

**Preparedness:** involves the development and regular testing of warning systems (linked to forecasting systems) and plans for evacuation or other measures to be taken during a disaster alert period to minimize potential loss of life and physical damage; the education and training of officials and the population at risk; the establishment of policies, standards, organizational arrangements and operational plans to be applied following a disaster impact; the securing of resources (possibly including the stockpiling of supplies and the earmarking of funds); and the training of intervention teams. It must be supported by enabling legislation. (Simeon Institute 1998)

**Preparedness:** Activities designed to minimize loss of life and damage, to organize the temporary removal of people and property from a threatened location and facilitate timely and effective rescue, relief and rehabilitation. See also "prevention." (U.N. 1992, 4)

**Preparedness:** "Activities and measures taken in advance to ensure effective response to the impact of disasters, including the issuance of timely and effective early warnings and the temporary removal of people and property from a threatened location." (U.N. ISDR 2002, 25)

**Prevention:** Encompasses activities designed to provide permanent protection from disasters. It includes engineering and other physical protective measures, and also legislative measures controlling land use and urban planning. See also "preparedness". (U.N. 1992, 5)

**Prevention:** "Activities to provide outright avoidance of the adverse impact of hazards and related environmental, technological and biological disasters." (U.N. ISDR 2002, 25)

**Probability:** The likelihood of a specific outcome, measured by the ratio of specific outcomes to the total number of possible outcomes. Probability is expressed as a number between 0 and 1, with 0 indicating an impossible outcome and 1 indicating an outcome is certain. (Standards 1995)

**Probability Analysis:** The derivation of both the likelihood of incidents occurring and the likelihood of particular outcomes (or effects) should those events occur. (NSW 1989)

**Public Assistance (PA):** Supplementary Federal assistance provided pursuant to a Presidential Declaration of emergency or major disaster under the Stafford Act to State and local governments or certain private, not-for-profit organizations other than assistance for the direct benefit of individuals and families. (FEMA/EMI 1996)

## R

**Radiation:** Emission or transfer of energy in the form of electromagnetic waves or particles. (WMO 1992, 492)

**Radiological Emergency:** A radiological incident that poses an actual, potential, or perceived hazard to public health or safety or loss of property. (FRERP, Appendix B)

**Recovery:** Those long-term activities and programs beyond the initial crisis period of an emergency or disaster and designed to return all systems to normal status or to reconstitute these systems to a new condition that is less vulnerable. (FEMA 1992)

**Recovery:** Activities traditionally associated with providing Federal supplemental disaster recovery assistance under a Presidential major disaster declaration. These activities usually begin within days after the event and continue after the response activities' cease. Recovery includes individual and public assistance programs, which provide temporary housing assistance, grants and loans to eligible individuals and government entities to recover from the effects of a disaster. (FEMA FRP Appendix B)

**Recovery:** "The process of restoring community infrastructure and social and economic systems following an emergency or disaster." (Michigan DEM, 1998, 7)

**Recovery:** ". . . recovery measures encompass what has traditionally been called reconstruction and recovery; ultimately the rebuilding of the disaster-impacted community." (Peterson and Perry 1999, 242; citing Drabek, 1986)

**Relief:** Assistance and/or intervention during or after disaster to meet the life preservation and basic subsistence needs. It can be of emergency or protracted duration. (U.N. 1992, 5)

**Resilience:** The capacity to recover successfully from loss and damage. The central features of resilience appear to be access to resources (particularly finance), access to information and services, the capacity to manage one's own affairs and the capacity to deal with the stress and emotions generated by the disaster. (Buckle 1995, 13)

**Resilience/Resilient:** "The capacity of a system, community or society to resist or to change in order that it may obtain an acceptable level in functioning and structure. This is determined by the degree to which the social system is capable of organizing itself, and the ability to increase its capacity for learning and adaptation, including the capacity to recover from a disaster." (U.N. ISDR 2002, 24)

**Resource Analysis:** The systematic identification and analysis of available resources and authorities for managing these potential resources in an emergency.

**Response:** Those activities and programs designed to address the immediate and short-term effects of the onset of an emergency or disaster. (FEMA 1992)

**Response:** "Carrying out time-sensitive actions to save lives and protect property during an emergency or disaster. In addition to managing the response, actions can include fire fighting, protective actions by law enforcement, warning, evacuation, mass care, emergency public information, search and rescue, health and medical care, resource management, and other activities." (Michigan DEM 1998, 7)

**Response:** "Response refers to actions undertaken immediately before and during impact to reduce primary and secondary negative effects." (Peterson and Perry 1999, 242)

**Richter Scale:** Logarithmic magnitude scale of earthquake energy, illustrated by typical impacts.

Energies of earthquakes (Richter-scale Magnitude):

Magnitude Energies (TNT)

1 = 1.7 Kg

2 = 5.9 Kg

3 = 180 Kg

4 = 6 tons

5 = 199 tons

6 = 6,270 tons

7 = 100,000 tons

8 = 6,270,000 tons

9 = 199,000,000 tons (Reference Center 1998)

**Risk:** A measure of the probability of damage to life, property, and/or the environment, which could occur if a hazard manifests itself, including the anticipated severity of consequences to people. (Unknown source)

**Risk:** "Risk is the product of hazard (H) and vulnerability (V) as they affect a series of elements (E) comprising the population, properties, economic activities, public services, and so on, under the threat of disaster in a given area. . . Risk is estimated by combining the probability of events and the consequences (usually conceptualized as losses) that would arise if the events take place." (Alexander, No Date, 1)

**Risk:** "Risk is nothing more than the consequences of hazard." (Bezek 2002)

**Risk:** ". . . risk is when you know the possible range of things that may happen following a choice; uncertainty is when you don't. . . Risk in its general form is when it is possible, at least in principle, to estimate the likelihood that an event (or set of events) will occur; the specific forms of those estimates are the probabilities of adverse consequences." (Clarke 1999, 11)

**Risk:** The possibility of suffering harm from a hazard. (Cohrssen and Covello 1989, 7)

**Risk:** ". . . the measure of likelihood of occurrence of the hazard" (Cutter 1993, 2).

**Risk:** "Risk is the probability of an event occurring, or the likelihood of a hazard happening (Presidential/Congressional Commission on Risk Assessment and Risk Management 1997). Risk emphasizes the estimation and quantification of probability in order to determine appropriate levels of safety or the acceptability of a technology or course of action. Risk is a component of hazard." (Cutter 2001, 3)

**Risk:** The probability that a hazardous event will occur and the expected loss of lives and goods due to vulnerability to prevailing hazards. (D&E Reference Center 1998)

**Risk:** ". . . the potential losses associated with a hazard and, defined in terms of expected probability and frequency, exposure, and consequences" (FEMA 1997, Multi Hazard. . . Risk Assessment, xxi).

**Risk:** Risk "is the probability that a hazard will occur during a particular time period." (Godschalk 1991, 132)

**Risk:** The potential for realization of unwanted, adverse consequences to human life, health, property, or the environment; estimation of risk is usually based on the expected result of the conditional probability of the event occurring times the consequence of the event given that it has occurred. (Gratt 1987, 244)

**Risk:** Risk is an expression or possible loss over a specific period of time or number of operational cycles. It may be indicated by the probability of an accident times the damage in dollars, lives, or operating units. (Hammer 1972)

**Risk:**"Risk refers to the probability that death, injury, illness, property damage, and other undesirable consequences will stem from a hazard" (Lerbinger 1997, 267).

**Risk:**"There are three components of risk - the magnitude of loss, the chance of loss, and the exposure of loss." (MacCrimmon and Wehrung 1986, 10)

"The main definition of the verb 'risk' in the Oxford English Dictionary, is 'to expose to the chance of injury or loss.' . . . First, it is necessary that there be a potential loss of some amount (we will use 'loss' as a general expression to include 'injury'). Second, there must be a chance of loss. A sure loss is not a risk. Third, the notion 'to expose' means that the decision maker can take actions that can increase (or decrease) the magnitude or chance of loss. Therefore 'to risk' implies the availability of choice." (MacCrimmon and Wehrung 1986, 9)

**Risk:** Risk is when there is "accurate knowledge of a probability distribution of the consequences that will follow on each alternative." (March and Simon, 1993)

**Risk:** Risk can be related directly to the concept of disaster, given that it includes the total losses and damages that can be suffered after a natural hazard: dead and injured people, damage to property and interruption of activities. Risk implies a future potential condition, a function of the magnitude of the natural hazard and of the vulnerability of all the exposed elements in a determined moment. (Maskrey 1989, 1)

**Risk:**"The term 'risk' is used in two ways. The first is to identify what is at risk from the threats generated by the hazard. The second is to identify the probability of losing community assets. . ." (May, p. 6)

**Risk:** Technical definition as follows: Risk (consequence/unit time) = Frequency (events/unit time) x Magnitude (consequence/event). (NRC 1975)

**Risk:**"The probability, based on available data and scientific knowledge, of a disaster occurring in a particular place." (Pearce 2000, Chapter 5, p. 27)

**Risk:** Defined in three ways:

1. With regard solely to the occurrence probability of the damaging event - a statistical concept.
2. With regard to both event probability and the degree and type of damage or potential damage (here, risk is seen as the product of event probability and severity of impact).
3. With regard to the distribution of power within society as well as to the distribution of costs and benefits. In other words, who bears and who imposes the risk? (Penning-Rowse and Handmer 1990, 6; cited in Pearce 2000, Chapter 2, 20)

**Risk:** A function of two major factors: (a) the probability that an event, or series of events of various magnitudes, will occur, and (b) the consequences of the event(s). (Petak and Alkinson 1982)

**Risk:** The potential for unwanted negative consequences of an event or activity. (Rowe 1997)

**Risk:** For engineering purposes, risk is defined as the expected losses (lives lost, persons injured, damage to property, and disruption of economic activity) caused by a particular phenomenon. Risk is a function of the probability of particular occurrences and the losses each would cause. Other analysts use the term to mean the probability of a disaster occurring and resulting in a particular level of loss. A societal element is said to be at "risk", or "vulnerable", when it is exposed to known disaster hazards and is likely to be adversely affected by the impact of those hazards if and when they occur. The communities, structures, services, or activities concerned are described as elements at "risk". Also, the FEMA damage and casualty production model for simultaneously handling multiple nuclear attacks to produce the spectrum of likely attack results and determine their associated possibilities. A pre-attack planning tool. (Simeon Institute 1992)

**Risk:** Risk is an integral part of life. Indeed, the Chinese word for risk "weij-ji" combines the characters meaning 'opportunity/chance' and 'danger' to imply that uncertainty always involves some balance between profit and loss. Since risk cannot be completely eliminated, the only option is to manage it. (Smith 1996, 54)

**Risk:** The probability per unit time of the occurrence of a unit cost burden. The cost burden may be measured in terms of injuries (fatalities or days of disability) or other damage penalties (expense incurred) or total social costs (including environmental intangibles). Risk thus involves the integrated combination of (a) the probability of occurrences, (b) the spectrum of event magnitudes, and (c) the spectrum of resultant personal injuries and related costs. (Starr, Rudman, and Whipple 1976)

**Risk:** The product of probability and consequences. (Tarrant 1997-98, 20)

**Risk:** ". . .the chance that some event that affects us adversely will occur." (Terry 2001, 330) ". . .the chance of an adverse event happening and the consequences of that event taken together." (331)

**Risk:** Expected losses (of lives, persons injured, property damaged and economic activity disrupted) due to a particular hazard for a given area and reference period. Based on mathematical calculations, risk is the product of hazard and vulnerability. (U.N. 1992, 5)

**Risk:** "The probability of harmful consequences, or expected loss (of lives, people injured, property, livelihoods, economic activity disrupted or environment damaged) resulting from interactions between natural or human induced hazards and vulnerable/capable conditions. Conventionally risk is expressed by the equation Risk = Hazards x Vulnerability/Capacity." (U.N. ISDR 2002, 24)

**Risk:** The possibility of loss, injury, disadvantage or destruction; to expose to hazard or danger; to incur risk or danger. (Webster's 1981)

**Risk:** Risk is the product of the probability of the occurrence of a hazard and its societal consequences. (Pearce 2000, Chapter 2, 21; citing Whyte and Burton, 1980)

**Risk Analysis:** The systematic use of available information to characterize risk. (Salter 1997-98, 24)

**Risk Analysis:** A detailed examination performed to understand the nature of unwanted, negative consequences to human life, health, property, or the environment; an analytical process to provide information regarding undesirable events; the process of quantification of the probabilities and expected consequences for identified risks. (Gratt 1987, 244)

**Risk Analysis:** ". . .incorporates estimates of the probability of various levels of injury and damage to provide a more complete description of the risk from the full range of possible hazard events in the area" (Deyle, French, Olshansky, and Paterson 1998, 121-122).

**Risk Analysis:** Risk analysis is the most sophisticated level of hazard assessment. It involves making quantitative estimates of the damage, injuries, and costs likely to be experienced within a specified geographic area over a specific period of time. Risk, therefore, has two measurable components: (1) the magnitude of the harm that may result (defined through vulnerability assessment); and (2) the likelihood or probability of the harm occurring in any particular location within any specified period of time (risk = magnitude x probability). A comprehensive risk analysis includes a full probability assessment of various levels of the hazard as well as probability assessments of impacts on structures and populations. (Deyle, French, Olshansky, and Paterson 1998, 134.)

**Risk Assessment:** "refers to the technical assessment of the nature and magnitude of risk". (Cohrssen and Covello, 1989)

**Risk Assessment:** The process of identifying the likelihood and consequences of an event to provide the basis for informed decisions on a course of action. (FEMA 1992)

**Risk Assessment:**"Risk assessment is the process of measuring the potential loss of life, personal injury, economic injury, and property damage resulting from natural hazards by assessing the vulnerability of people, buildings, and infrastructure to natural hazards.

Risk assessment answers the fundamental question that fuels the natural hazard mitigation process: "What would happen if a natural hazard event occurred in your community."

A risk assessment tells you:

"The hazards to which your state or community is susceptible;

What these hazards can do to physical, social, and economic assets;

Which areas are most vulnerable to damage from these hazards; and

The resulting cost of damages or costs avoided through future mitigation projects." (FEMA 2001, iii)

**Risk Assessment:** Risk assessment estimates the probable degree of injury and property damage in a given area over a specific time interval (Godschalk, Kaiser, and Berke 1998, 99.)

**Risk Assessment:** The process, including both risk analysis and risk management alternatives, of establishing information regarding and acceptable levels of that risk for an individual, group, society, or the environment. (Gratt 1987, 244)

**Risk Assessment:**"A risk assessment is an objective scientific assessment of the chance of experiencing loss or adverse consequences when physical and social elements are exposed to potentially harmful natural and technological hazards, environmental impact, morbidity, and mortality." (Hays and Ryland 2001)

**Risk Assessment:**"Risk assessment, is a systematic characterization of the probability of an adverse event and the nature and severity of that event (Presidential/Congressional Commission on Risk Assessment and Risk Management 1997). Risk assessments are most often used to determine the human health or ecological impacts of specific chemical substances, microorganisms, radiation, or natural events. . . .In the natural-hazards field, risk assessment has a broader meaning, and involves a systematic process of defining the probability of an adverse event (e.g., flood) and where that event is most likely to occur." (Hill and Cutter 2001, 15-16)

**Risk Assessment:** (sometimes Risk Analysis) The process of determining the nature and scale of the losses (due to disasters) which can be anticipated in particular areas during a specified time period. Risk assessment involves an analysis and combination of both theoretical and empirical data concerning the probabilities of known disaster hazards of particular force or intensities occurring in each area ("hazard

mapping"); and the losses (both physical and functional) expected to result to each element at risk in each area from the impact of each potential disaster hazard ("vulnerability analysis and expected loss estimation"). (Simeon Institute 1992)

**Risk Assessment:**"The statistical analysis of risk. . .based on mathematical theories of probability and scientific methods for identifying causal links between different types of hazardous activity and the resulting adverse consequences" (Smith 1996, 57).

According to Kates and Kasperson (1983), risk assessment comprises three distinct steps:

1. An identification of hazards likely to result in disasters, i.e. what hazardous events may occur?
2. An estimation of the risks of such events, i.e. what is the probability of each event?
3. An evaluation of the social consequences of the derived risk, i.e. what is the loss created by each event?" (Smith 1996, 58)

Risk Assessment/Analysis: "A process to determine the nature and extent of risk by analyzing potential hazards and evaluating existing conditions of vulnerability/capacity that could pose a potential threat or harm to people, property, livelihoods and the environment on which they depend." (U.N. ISDR 2002, 24

**Risk Aversion:** ". . .the value people place directly on reducing their own and others' risk of death and injury. . ." (Smith 1996, 72).

**Risk Characterization:** "Risk characterization is a synthesis and summary of information about a potentially hazardous situation that addresses the needs and interests of decision makers and of interested and affected parties. Risk characterization is a prelude to decision making and depends on an interactive, analytical-deliberate process." (National Research Council, 1996, p. 27)

**Risk Communication:** ". . . the effective understanding of risks and the transfer of risk information to the public, and the transfer of information from the public to decisionmakers. . .Risk management decisions should not simply be made by technical experts and public officials and then imposed on, and justified to, the public after the fact. Risk Communication involves a dialogue among interested parties - risk experts, policy makers, and affected citizens." (Committee on Risk-Based Analysis. . .2000, 37)

**Risk Communication:** ". . .an interactive process of exchange of information and opinion among individuals, groups and institutions. . .We construe risk communication to be successful to the extent that it raises the level of understanding of relevant issues or actions for those involved and satisfies them that they are adequately informed within the limits of available knowledge." (NRC 1989, 2)

"The NRC (1989, 149) concludes that four objectives are key to improving risk communications: (1) goal setting, (2) openness, (3) balance, and (4) competence. As a means of achieving these objectives, it is important, at the start of any given project, to determine:

- what the public know, believe, and do not believe about the subject risk and ways to control it;
- what quantitative and qualitative information participants need to know to make critical decisions;
- and how they think about and conceptualize the risk. (NRC 1989, 153)." (Pearce 2000, Chapter 3, 16)

"Pidgeon et al. (cited in Horlick-Jones and Jones 1993, 31) conclude that there are four different conceptual approaches to risk communication:

- Scientific communications - 'top-down' or one-way transmission of some message about a hazard from a particular 'expert' source to a target 'non-expert' audience.

- Two-way exchange - an interactive process that recognizes the important role that feedback plays in any complex communication.
- Wider institutional and cultural contexts stressed - communicator takes account of the actions of risk management institutions, possible conflicting messages, and the history of the hazard in question.
- Risk communication as part of a wider political process - the process as a prerequisite to the enabling and empowerment of risk-bearing groups." (Pearce 2000, Chapter 3, 16)

**Risk Factors:** Frequency of Occurrence

Location

Spatial Area (% of jurisdiction hazard likely to impact)

Duration

Secondary Effects

Seasonality

Speed of onset

Warning availability

**Risk Management:** "Public Risk management is a process that is used to decide what to do where a risk has been determined to exist. It involves identifying the level of tolerance the community has for a specific risk or set of risks and determines what risk assessment options are acceptable within a social, economic, cultural and political context. To achieve this, the process must be open since it has to factor in benefits, costs of control and any statutory or socially approved requirements needed to manage the risk. Hence, it requires communicating and consulting with the public-at-large, either directly or through appropriate representation as well as with specialists" (Britton 1998, 1).

**Risk Management:** The process of intervening to reduce risk-the making of public and private decisions regarding protective policies and actions that reduce the threat to life, property, and the environment posed by hazards. Generally, the risk management process attempts to answer the following questions:

1. What can be done?
2. What options or alternatives are available and what are their associated tradeoffs in terms of costs, benefits, and other (current and future risks)?
3. What are the effects of current decisions on future options? (Shaw, 1999.)

**Risk Management:** A Framework for the systematic application of management policies, procedures and practices to the tasks of identifying, analyzing, evaluating, treating and monitoring risk. (Standards 1995, 4360; quoted in Salter (1997-98, 22)

**Risk Management:** "The systematic management of administrative decisions, organizations, operational skills and responsibilities to apply policies, strategies and practices for disaster risk reduction." (U.N. ISDR 2002, 25)

**Risk Management:** "Process of deciding what should be done about a hazard; deciding which hazards at what scale (intensity, occurrence interval) should be managed and in what priority." (Williamson and Lawless, 2001)

**Risk Perception:** "Slovic (cited in Slaymaker 1995, 3) defines risk perception as 'the 'common sense' understanding of hazards, exposure and risk, arrived at by a community through intuitive reasoning . . . usually expressed. . . as 'safe' or 'unsafe'.' He goes on the mention that 'policy decisions are almost always driven by perceived risk among the population affected and among decision makers [and that] these perceptions are commonly at variance with 'technical' risk assessments.'" (Pearce 2000, Chapter 3, 18)

**Risk Reduction:** Long-term measures to reduce the scale and/or the duration eventual adverse effects of unavoidable or unpreventable disaster hazards on a society which is at risk, by reducing the vulnerability of its people, structures, services, and economic activities to the impact of known disaster hazards. Typical risk reduction measures include improved building standards, flood plain zoning and land-use planning, crop diversification, and planting windbreaks. The measures are frequently subdivided into "structural" and "non-structural", " active" and "passive" measures. N.B. A number of sources have used " disaster mitigation" in this context, while others have used "disaster prevention." (Simeon Institute 1992)

S

**Safety:** Safety, in the traditional sense, refers to monitoring and reducing the risk of personnel casualties (injuries and deaths) to some acceptable level. (Shaw forthcoming)

**Saffir/Simpson Hurricane Scale:** A scale for expressing the relative intensity of hurricanes, consisting of five levels of increasing intensity-Categories 1 through 5. (Notification Manual)

Saffir/Simpson Hurricane Scale

Storm Category	Wind Speed (mph)	Storm Surge (ft)
1	74-95	4-5
2	96-110	6-8
3	111-130	9-12
4	131-155	13-18
5	155 >	>18

**Security:** Security in the traditional sense refers to monitoring and reducing the risk of human induced events that adversely affect people or property (intrusion of unauthorized personnel, theft, sabotage, assault, etc.), to some acceptable level. (Shaw 1999)

**Severe Weather:** Any atmospheric condition potentially destructive or hazardous form human beings. It is often associated with extreme convective weather (tropical cyclones, tornadoes, severe thunderstorms, squalls, etc.) and with storms of freezing precipitation or blizzard conditions. (WMO 1992, 544)

**Stafford Act:** 1) The Robert T. Stafford Disaster Relief and Emergency Assistance Act, Public Law 93-288, as amended. 2) The Stafford Act provides an orderly and continuing means of assistance by the

Federal Government to State and local governments in carrying out their responsibilities to alleviate the suffering and damage which result from disaster. The President, in response to a State Governor's request, may declare an "emergency" or "major disaster" in order to provide Federal assistance under the Act. The President, in Executive Order 12148, delegated all functions, except those in Sections 301, 401, and 409, to the Director, of FEMA. The Act provides for the appointment of a Federal Coordinating Officer who will operate in the designated area with a State Coordinating Officer for the purpose of coordinating state and local disaster assistance efforts with those of the Federal Government. (44 CFR 206.2)

**Storm Surge:** The difference between the actual water level under influence of a meteorological disturbance (storm tide) and the level which would have been attained in the absence of the meteorological disturbance (i.e. astronomical tide). (WMO 1992, 584)

**Superfund:** The trust fund established initially under the Comprehensive Environmental Response, Compensation, and Liability Act and extended under the Superfund Amendments and Reauthorization Act to provide money that can be used during cleanups associated with inactive hazardous waste disposal sites. (FEMA 1992)

**Sustainable Communities:** .where people and property are kept out of the way of natural hazards, where the inherently mitigating qualities of natural environmental systems are maintained, and where development is designed to be resilient in the face of natural forces. . ." (Godschalk, Kaiser, and Berke 1998, 86)

**Sustainable Development:** "In its broader sense, sustainability is defined as development that meets the needs of the present without compromising the ability of future generations to meet their own needs. In the context of emergency management, this meaning remains and it is linked to creating places that are less vulnerable to natural and technological hazards and that are resilient to those events. Sustainable hazard management has five components: environmental quality; quality of life; disaster resilience; economic vitality; and inter- and intra-generational equity. Reducing the risk from hazards, reducing losses from disasters and working toward sustainable communities go hand-in-hand" (Britton 1998, 1).

**Sustainable Development:** ". . .the reconciliation of society's development goals with Planet Earth's environmental limits over the long term." (Carrido and Hays 2001, 1)

**Sustainable Development:** "Sustainable development - which meets the needs of the present without compromising the ability of future generations to meet their own needs - is generally understood to require (1) economic growth, (2) protection of the environment, and (3) sustainable use of ecological systems. There is, however, a fourth criterion of equal importance: Sustainable development must be resilient with respect to the natural variability of the Earth and the solar system." (NSTC 1996, 4)

**Sustainable Development:** Sustainable development is that which "meets the needs of the present without compromising the ability of future generations to meet their own needs." (UN World Commission 1987, 8)

## T

**Terrorism:** "The calculated use of unlawful violence or threat of unlawful violence to inculcate fear; intended to coerce or to intimidate governments or societies in the pursuit of goals that are generally political, religious, or ideological." (FEMA Disaster Dictionary 2001, 120; citing DoD Joint Pub 1-102)

**Thunderstorm:** Sudden electrical discharges manifested by a flash of light (lightning) and a sharp or rumbling sound (thunder). Thunderstorms are associated with convective clouds (Cumulonimbus) and are, more often, accompanied by precipitation in the form of rain showers or hail, or occasionally snow, snow pellets, or ice pellets. (WMO 1992, 622)

**Tornado:** A violently rotating storm of small diameter; the most violent weather phenomenon. It is produced in a very severe thunderstorm and appears as a funnel cloud extending from the base of a Cumulonimbus to the ground. (WMO 1992, 626)

**Tragedy:** "An intensely sad, calamitous, or fatal event or course of events; disaster" (Funk & Wagnalls 1996).

"The word 'tragedy' summons up in one's mind the inevitability not only of this event but of other similar events in the past and more to follow. Responsibility can be successfully abrogated with the application of the label 'tragedy'. . . One needs to look no further into the cause or causes of this event because it has now been lifted outside of one's power and into the domain of Greek drama and fate. As a tragedy, it was fated to be and the only possible response is to accept it (and others of its kind) as part of the inescapable human situation. The event may be mourned and one may sympathize briefly with the victims. But one is freed (by thinking of it as a tragedy) from the need to examine the conceptual apparatus that led to this outcome" (Allinson 1993, 14).

**Typhoon:** Name given to a tropical cyclone with maximum sustained winds of 64 knots or more near the centre in the western North Pacific. (WMO 1992, 644)

## U

**Unified Command:** "Under the ICS [Incident Command System] concept of operations, Unified Command is a unified team effort which allows all agencies with responsibility for an incident, either geographical or functional, to manage an incident by establishing a common set of incident objectives and strategies. This Unified Command effort is accomplished without losing or abdicating agency authority, responsibility, or accountability." (FEMA Disaster Dictionary 2001, 124; citing ICS Glossary)

## V

**Volcanic Dust:** Dust of particles emitted by a volcano during an eruption. They may remain suspended in the atmosphere for long periods and be carried by the winds to different regions of the Earth. (WMO 1992, 662)

**Vulnerability:** the characteristics of a person or group in terms of their capacity to anticipate, cope with, resist, and recover from the impact of a natural hazard. It involves a combination of factors that determine the degree to which someone's life and livelihood is put at risk by a discrete and identifiable event in nature or in society. (Blaikie et al., 9)

**Vulnerability:** "Risk. . . should not be confused with vulnerability, which refers to the resources and coping abilities of a specific community to a specific hazard. . . Vulnerability is a reflection of the community's coping resources and may vary within the smaller social and economic groups which form a large community." (Lindsay 1993, 68)

**Vulnerability:** "For some, particularly natural and physical scientists, vulnerability is defined as proximity or exposure to natural hazards or the probability of a disastrous occurrence (including the potential for losses owing to triggering agents) (see Reynolds 1993). Engineers, in contrast, define vulnerability as the ability of a built structure to resist the strain or force exerted by natural or other disaster agents (Norton and Chantry 1993). Sociologists, anthropologists and other social scientists define vulnerability as the amount of coping capacity, or the degree to which social, cultural, political and economic factors limit the ability to take steps to mitigate, prepare for, respond to, or recover from disaster (see Blaikie and others 1994; Sinha 1992a ; Pelanda 1982 )." (McEntire 1999, 5)

**Vulnerability:** "The susceptibility of people, property, industry, resources, ecosystems, or historical buildings and artifacts to the negative impact of a disaster." (Pearce 2000, Chapter 5, p. 37). Is "a function of people, place, preparedness, and time. . ." (Ibid., p. 44)

**Vulnerability:** "Vulnerability can be defined as the propensity to incur loss." (Puente 1999,296)

**Vulnerability:** The degree of susceptibility and resilience of the community and environment to hazards, the characteristics of a community or system in terms of its capacity to anticipate, cope with, and recover from events. (Salter 1997-98, 28)

**Vulnerability:** The extent to which a community, structure, service, or geographic area is likely to be damaged or disrupted by the impact of a particular disaster hazard, on account of their nature, construction, and proximity to hazardous terrain or a disaster-prone area. For engineering purposes, vulnerability is a mathematical function defined as the degree of loss to a given element at risk, or set of such elements, expected to result from the impact of a disaster hazard of a given magnitude. It is specific to a particular type of structure, and expressed on a scale of 0 (no damage) to 1 (total damage). For more general socio-economic purposes and macro-level analyses, vulnerability is a less-strictly-defined concept. It incorporates considerations of both the intrinsic value of the elements concerned and their functional value in contributing to communal well-being in general and to emergency response and post-disaster recovery in particular. In many cases, it is necessary ( and sufficient) to settle for a qualitative classification in terms of "high", "medium", and "low"; or explicit statements concerning the disruption likely to be suffered. (Simeon Institute)

**Vulnerability:** Ability to withstand damage - expressed on a scale of 0 (no damage) to 10 (total damage). (UNDRO 1991)

**Vulnerability:** Degree of loss (from 0% to 100%) resulting from a potentially damaging phenomenon. (U.N. 1992, 5)

**Vulnerability:** "A set of conditions and processes resulting from physical, social, economical and environmental factors, which increase the susceptibility of a community to the impact of hazards." (U.N. ISDR 2002, 24)

**Vulnerability Analysis:** Identifies what is susceptible to damage. Should provide information on extent of the vulnerable zone; population, in terms of size and types that could be expected to be within the vulnerable zone; private and public property that may be damaged, including essential support systems and transportation corridors; and environment that may be affected.

**Vulnerability Analysis:** The process of estimating the vulnerability to potential disaster hazards of specified elements at risk. For engineering purposes, vulnerability analysis involves the analysis of theoretical and empirical data concerning the effects of particular phenomena on particular types of structures. For more general socio-economic purposes, it involves consideration of all significant elements in society, including physical, social and economic considerations (both short and long-term), and the extent to which essential services (and traditional and local coping mechanisms) are able to continue functioning. (Simeon Institute 1998)

**Vulnerability Analysis:** The objectives of a vulnerability analysis of an industrial system may comprise:

To identify potential threats to the system

To verify that the vulnerability of the system is acceptable

To verify that the system's security actions and installations, and safety functions are adequate

To evaluate the cost-effectiveness of a proposed action to improve the vulnerability

To aid in establishing an emergency preparedness plan

As a design tool-to design a robust system

In a vulnerability analysis we work with open system models, where risk factors both inside and outside the physical boundaries of the system are taken into account. A vulnerability analysis and a risk analysis of the same company will therefore produce quite different sets of accidental events. . . .

A traditional risk analysis is mainly limited to accidental events taking place within the physical boundaries of the system, and the threats studied are often limited to technological hazards within these boundaries. . . .The actions to mitigate, restore and restart the activities after an accident are normally not part of a risk analysis. . . .A vulnerability analysis focuses on the whole disruption period until a new stable situation is obtained. . . .The focal point of a vulnerability analysis is the (business) survivability of the system. (Einarsson and Raussand 1998)

**Vulnerability Assessment:** Evaluation of the likely degree of loss to a risk or a set of hazards. (D&E Reference Center 1998)

**Vulnerability Assessment:** . . .characterizes the exposed populations and property and the extent of injury and damage that may result from a natural hazard event of a given intensity in a given area. (Deyle, French, Olshansky and Paterson 1998, 121).

**Vulnerability Assessment:** Vulnerability assessment, the second level of hazard assessment, combines the information from the hazard identification with an inventory of the existing (or planned) property and population exposed to a hazard. It provides information on who and what are vulnerable to a natural hazard within the geographic areas defined by hazard identification; vulnerability assessment can also estimate damage and casualties that will result from various intensities of the hazard." (Deyle et al. 1998, 129)

**Vulnerability Assessment:** Vulnerability assessment estimates the number of people exposed to hazards (including special populations such as the elderly, hospitalized, disabled, and concentrated populations such as children in schools), the property exposed, and the critical facilities exposed (such as medical care facilities, bridges, sewage treatment and water pumping and treatment plants, power plants, and police and fire stations. (Godschalk, Kaiser, and Berke 1998, 98-99.)

**Vulnerability Assessment:** "...The concept of vulnerability incorporates the notion of differential susceptibility and differential impacts." (Hill and Cutter, 2001, 16)

## W

**Warning:** Dissemination of message signaling imminent hazard which may include advice on protective measures. See also "alert". (U.N. 1992, 5)

**Warning:** A warning is issued by the National Weather Service to let people know; that a severe weather event is already occurring or is imminent. People should take immediate safety action. (Simeon Institute 1992)

**Watch:** A watch is issued by the National Weather Service to let people know that conditions are right for a potential disaster to occur. It does not mean that an event will necessarily occur. People should listen to their radio or TV to keep informed about changing weather conditions. A watch is issued for specific geographic areas, such as counties, for phenomena such as hurricanes, tornadoes, floods, flash floods, severe thunderstorms, and winter storms. (Simeon Institute 1992)

**Wetlands:** Those areas which are inundated or saturated by surface or ground water with a frequency sufficient to support, or that under normal hydrologic conditions does or would support, a prevalence of vegetation or aquatic life typically adapted for life in saturated or seasonally saturated soil conditions. Examples of wetlands include, but are not limited to, swamps, fresh and salt water marshes, estuaries, bogs, beaches, wet meadows, sloughs, potholes, mud flats, river overflows, and other similar areas. This definition includes those wetland areas separated from their natural supply of water as a result of activities such as the construction of structural flood protection methods or solid-fill road beds and

activities such as mineral extraction and navigation improvement. This definition is intended to be consistent with the definition utilized by the U.S. Fish and Wildlife Service in the publication entitled, Classification of Wetlands and Deep Water Habitats of the United States (Cowardin et al., 1977). (FEMA 1992)

## Appendix F

### For more information

The following government agencies offer a wealth of information on Citizen Corps, CERT, Disaster preparedness and more.

#### **Citizens Corps**

<http://www.citizencorps.gov>

#### **C.E.R.T.**

<http://www.citizencorps.gov/cert>

#### **FEMA**

<http://www.fema.gov>

#### **National Response Framework Resource Center**

<http://www.fema.gov/NRF>

#### **Riverside County CERT**

<http://www.rvcfire.org>

#### **OES**

<http://www.oes.ca.gov>

#### **Southern California Earthquake Data Center**

<http://www.data.scec.org>

#### **U.S. Department of Homeland Security**

<http://www.dhs.gov/index.shtm>