EMERGENCY PREPAREDNESS WORKSHOP:

Natural Disasters

Presented By: Jon Sherman

Natural Disasters

- Natural disasters can range from light to severe.
- We usually don't know when they will occur or how much damage they will cause.
- Each year, natural disasters are responsible for billions of dollars worth of damage.
- Besides the potential for the loss of life, natural disasters may also impact our defense or economic security.
- Some critical infrastructures that may be affected are:

Critical Infrastructures

- Telecommunications infrastructure: Telephone, data services, and Internet communications, which have become essential to continuity of business, industry, government, and military operations.
- Electrical power systems: Generation stations and transmission and distribution networks that create and supply electricity to end-users.
- Gas and oil facilities: Production and holding facilities for natural gas, crude and refined petroleum, and petroleum-derived fuels, as well as the refining and processing facilities for these fuels.
- Banking and finance institutions: Banks, financial service companies, payment systems, investment companies and securities/commodities exchanges.
- Transportation networks: Highways, railroads, ports and inland waterways, pipelines, and airports and airways that facilitate the efficient movement of goods and people.

Critical Infrastructures

- Water supply systems: Sources of water; reservoirs and holding facilities; aqueducts and other transport systems; filtration, cleaning, and treatment systems; pipelines; systems for dealing with water runoff, wastewater and firefighting.
- Government services: Capabilities at federal, state, and local levels of government required to meet the needs for essential services to the public.
- Emergency services: Medical, police, fire, and rescue systems.
- Dam Failure: Such a failure presents a significant potential for a disaster in that significant loss of life and property would be expected in addition to the possible loss of power and water resources.

Earthquakes

Are Earthquakes Increasing in Frequency?

- Although it may seem that we are having more earthquakes, earthquakes of magnitude 7.0 or greater have remained fairly constant.
- A partial explanation is that in the last 20 years, we have more seismograph stations meaning an increase in the number of earthquakes we have been able to locate each year.
- In 1931, there were ~ 350 stations operating in the world; today, there are more than 8,000 stations.
- This increase has allowed us to locate many small earthquakes which were undetected in earlier years.
- We now locate about 20,000 earthquakes each year or about 50 per day.

Are Earthquakes Increasing in Frequency?

•According to long-term records (since about 1900), we expect about 17 major earthquakes (7.0 - 7.9) and one great earthquake (8.0 or above) in any given year.

Magnitude	Average Annually
8 and higher	1
7 - 7.9	17
6 - 6.9	134
5 - 5.9	1319
4 - 4.9	13,000
3 - 3.9	130,000
2 - 2.9	1,300,000

http://earthquake.usgs.gov/learn/topics/increase_in_earthquakes.php

Earthquakes Worldwide 2001-2011

As of May Dec 31, 2011:

Magnitude	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
8.0 to 9.9	1	0	1	2	1	2	4	0	1	1	1
7.0 to 7.9	15	13	14	14	10	9	14	12	16	23	19
6.0 to 6.9	121	127	140	141	140	142	178	168	142	151	185
5.0 to 5.9	1224	1201	1203	1515	1693	1712	2074	1768	1754	2069	2276
4.0 to 4.9	7991	8541	8462	10888	13917	12838	12078	12291	6928	10303	13315
3.0 to 3.9	6266	7068	7624	7932	9191	9990	9889	11735	2898	4326	2791
2.0 to 2.9	4164	6419	7727	6316	4636	4027	3597	3860	3007	4624	3643
1.0 to 1.9	944	1137	2506	1344	26	18	42	21	25	39	47
0.1 to 0.9	1	10	134	103	0	2	2	0	1	0	1
No Magnitude	2807	2938	3608	2939	864	828	1807	1922	20	24	11
Total	23534	27454	31419	31194	30478	29568	29685	31777	* 14792	* 21560	*22289
Estimated Deaths	21357	1685	33819	228802	88003	6605	712	88011	1787	320120	21953

* Starting in January 2009, the USGS National Earthquake Information Center no longer locates earthquakes smaller than magnitude 4.5 outside the United States, unless we receive specific information that the earthquake was felt or caused damage. http://earthquake.usgs.gov/earthquakes/eqarchives/year/eqstats.php

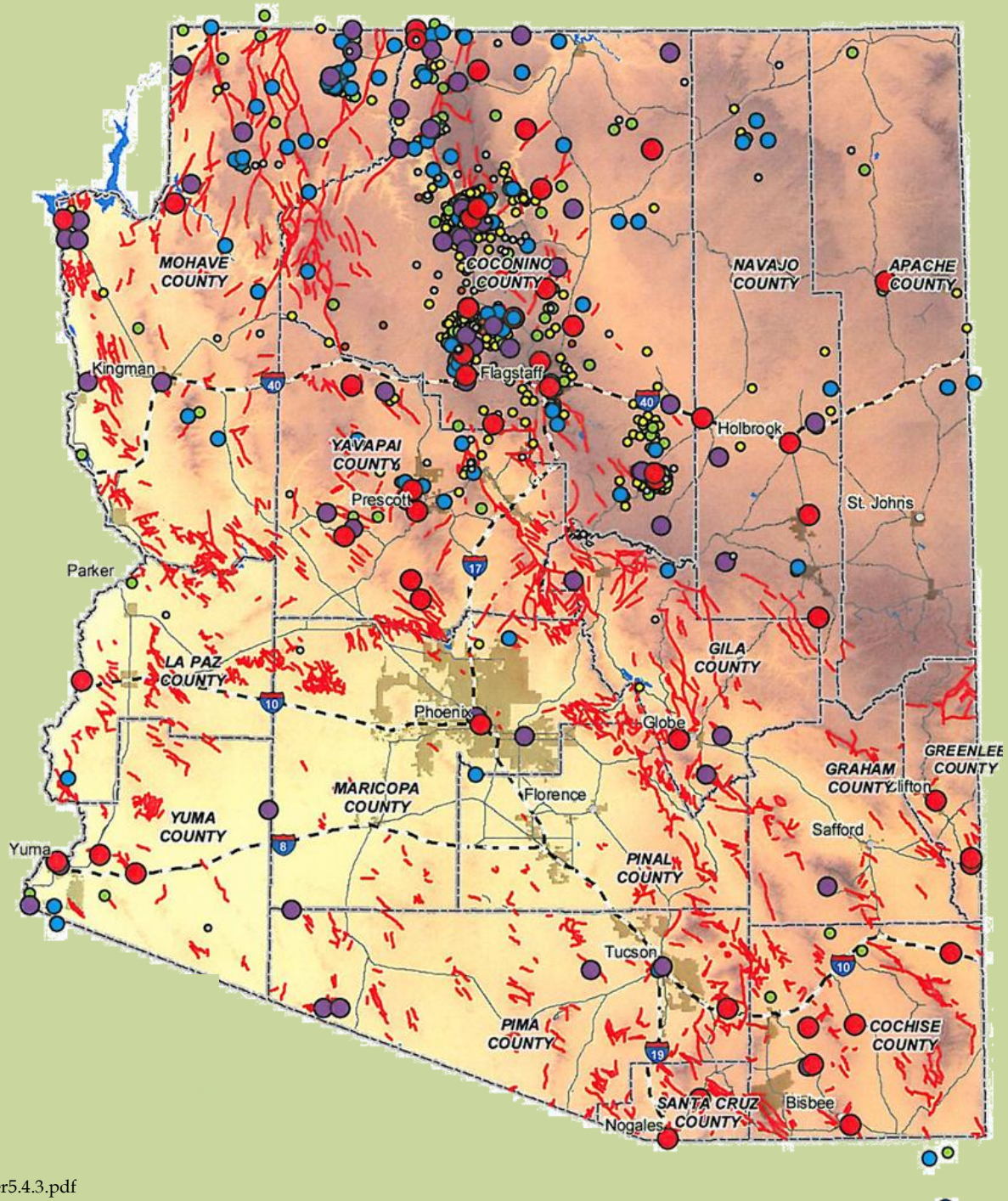
Earthquakes in Arizona

- Because of the relative scarcity of earthquakes in Arizona, we might assume we are free from this danger.
- The truth is, the entire state has been susceptible to some ground-shaking from time to time, although the southwestern and northwestern part of the state are typically more vulnerable.
- Earthquakes occurring in neighboring areas, such as California and northern Mexico, can also put us at risk depending on their magnitude.
- Contrary to popular belief, Arizona lies within and adjacent to seismic zones that have the potential to damage major structures such as dams and roadways, and the potential to cause loss of life.
- Active faults in northern AZ. and CA. and Mexico have generated large earthquakes that have damaged structures within Arizona's borders.
- Several hundred earthquakes have occurred in Arizona over the last 150 years, some of which have been estimated and recorded at magnitude 5.6 or greater.

Arizona Earthquake Epicenters & Faults

Earthquake Magnitude	Total Events
0 - 0.5	103
0.6 - 1.5	189
1.6 - 2.5	420
2.6 - 2.9	106
3.0 - 3.5	109
3.6 - 4.5	100
4.6 - 6.9	73
Faults	
	1,100

Recorded up through 2009



http://www.dem.azdema.gov/operations/docs/mitplan/chapter5.4.3.pdf

Earthquakes in Arizona (Phoenix Area)

- The seismic risk to the Phoenix area is elevated due to the large and rapidly expanding population, existence of high rise buildings, predominance of un-reinforced masonry buildings, and lack of earthquake awareness among its population.

- The rate of seismicity in the Phoenix area is low, with the most recent quakes originating in Cave Creek in 1974 (M 3.0) and the Mogollon Plateau near Payson in 2003 (M 4.6).

- The area has been impacted by major earthquakes in southern California and northern Mexico, including the 1887 Sonoran earthquake (M 7.2), which caused ground shaking and triggered rock falls in the Phoenix area.

- The largest impact of an earthquake on the Phoenix metropolitan area would be the economic impact from a catastrophic southern California earthquake, which would disrupt approximately 60% of Arizona's fuel and 90% of Arizona's food goods. Large earthquakes in Yuma could also cause major damage or food shortages in the Phoenix area.

Earthquakes in Arizona (Phoenix Area)

• A repeat of the 1887 earthquake would result in significant damage to Arizona's population centers.

•The Sugarloaf and Horseshoe faults are the nearest mapped potentially active faults, both approximately 40 miles northeast of the Phoenix area. A M 6.75 event is the largest credible earthquake that could occur on these faults, which would result in rock falls, dam failure, liquefaction, destructive resonance in reinforced concrete buildings, and ground motion sufficient to cause damage in other structures (Bausch & Brumbaugh, June 13, 1994).

•It should also be noted that although the small earthquakes that commonly occur in Arizona pose low seismic risk to buildings, the repeated shaking could eventually cause structural damage. They may trigger landslides in unstable areas and cause boulders to roll off mountain slopes possibly blocking transportation routes in and out of the area.

Earthquakes in Arizona (Phoenix Area)

•Probability: In Phoenix, earthquakes are rated within the "possible" to "likely" range.

•Vulnerability: The impact or losses from earthquakes has generally been low in the more developed and populated areas of the State. Small Earthquakes have occurred, which with repeated shaking can cause structural damage. If an earthquake impacts an area of sensitivity or initiates a secondary hazard such as dam failure, subsidence or fissures, the damages and loss of life could be substantial.

Earthquakes: Hazards in the Home

•Although there are no guarantees of safety during an earthquake, you can reduce earthquake caused injuries and property damage by following these basic tips:

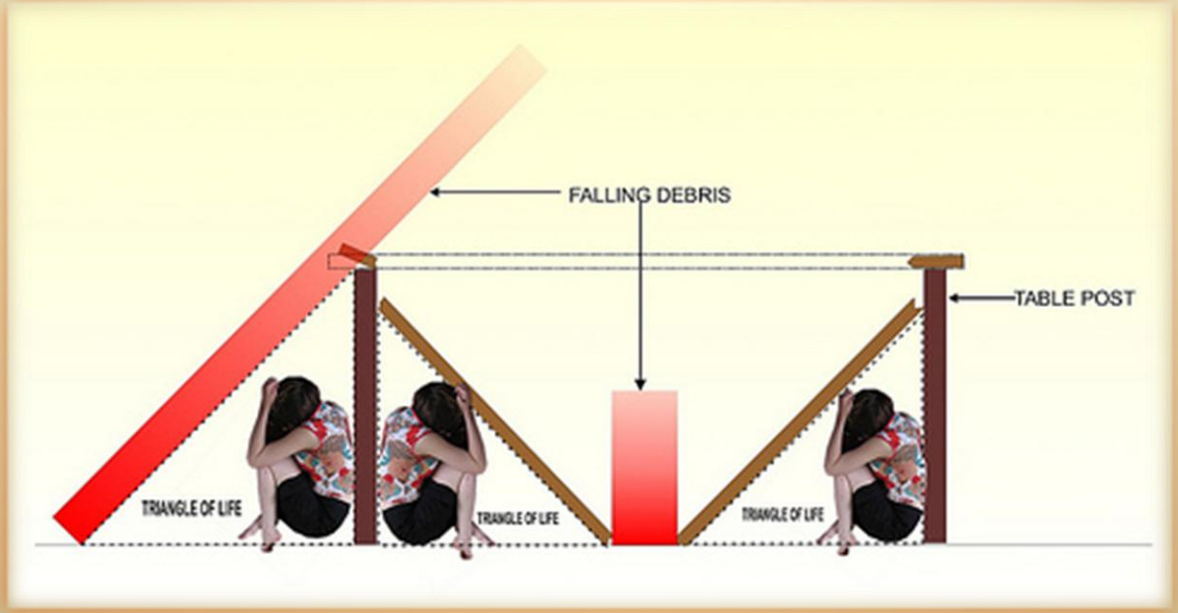
- Fasten shelves securely to walls
- Place large or heavy objects on lower shelves
- Store breakable items such as bottled foods, glass, and china in low, closed cabinets with latches
- Hang heavy items such as pictures and mirrors away from beds, couches, and anywhere people sit
- Brace overhead light fixtures
- Repair defective electrical wiring and leaky gas connections, these are potential fire risks
- Secure a water heater by strapping it to the wall studs and bolting it to the floor
- Repair any deep cracks in ceilings or foundations. Get expert advice if there are signs of structural defects
- Store weed killers, pesticides, and flammable products securely on bottom shelves in closed cabinets with latches.

Earthquakes: During the Quake

- Duck, Cover and Hold-On!
- Under sturdy furniture such as a heavy desk or table.
- Against an inside wall (close to an exit so you aren't trapped)
- Away from glass windows, mirrors, pictures, heavy bookcases, china buffets, or other furniture which could fall over.
- In the open, away from buildings, trees, telephone and electrical lines, overpasses, or elevated expressways.

Earthquakes: During the Quake

- Triangle of Life
- Some experts believe that if you are not in an Earthquake retrofitted building, that you should not hide under a desk or doorway but next to a sturdy object where a void will be created by falling debris.
- This theory is disputed by FEMA and the American Red Cross



Earthquakes: After the Quake

Warning! Aftershocks may occur at anytime. Plan ahead where you will take cover.

- Remain calm and reassure others.
- For personal safety, wear sturdy shoes and leather gloves. Avoid broken glass.
- Check for injuries. Give first aid as necessary.
- Replace all telephone receivers and use phones for emergency calls only. Call out-of-state contacts to notify family you are safe.
- Check for fires; gas, water, broken sewage lines; downed electric lines; building damage and potential problems during after shocks, such as foundation cracks. Turn off interrupted utilities as necessary. Stay out of damaged buildings.
- Do not use matches or open flames until you are sure there are no gas leaks.
- Don't turn light switches off and on. Sparks created by the switch contacts can ignite gas fumes.
- Clean up dangerous spills.
- Tune to the emergency broadcast stations on radio or television. Listen for emergency bulletins.
- Seek higher ground in tidal areas (tsunami risk) or flood prone areas in case of dam failure.

Earthquakes: After the Quake

• Following a major earthquake where there is a loss of life, damage to your home or your community's critical infrastructure, things will not return to normal very quickly.

• You may find yourself without access to medical care, food, water, utilities…including electricity to cook your meals.

• After an earthquake is often when most deaths occur. Now is when real survival begins.

• Plan ahead to prepare for basic needs following an earthquake.

Earthquakes: Planning Ahead

- 90-Day Food Supply
  - Store a 90-Day Supply of Food that requires no refrigeration and little to no cooking.
  - Following this principle means you should be able to last 3 months with little or no cooking necessary.
  - MRE's, Canned Ravioli and Canned Chili for example can be eaten with no cooking what-so-ever.

Sources of Light for Remaining Needs

- Lighting
  - Light Sticks are useful during gas leaks or for child night lights.
  - Buy flashlights that use standard sized batteries so they are easier to find and replace.
  - Buy Rechargeable batteries, including extras so you always have a supply of charged batteries available.
  - LED bulbs use less battery power.

Earthquakes: Planning Ahead

- Simple Cooking Methods:
  - Rocket Stove (Fuel = twigs)
  - Alcohol Stoves (Possible Indoor Use)
  - Wonderbox (Heat Retention Cooker)
  - Propane Stoves
  - Charcoal

Earthquakes: Planning Ahead

- First Aid Supplies

Earthquakes: Planning Ahead

- Potable Water

Earthquakes: Planning Ahead

- Sanitation
- 5-6 gallon bucket with Toilet seat lid
- Garbage bags [kitchen size] (to use as toilet liners)
- Large garbage bags for storing sewage.
- Toilet paper
- Liquid bleach
- Rubber gloves
- Kitty Litter
- Chemical deodorant and/or enzyme digester
- Rope, tarp and clothes pins or pop-up privacy shelter
- Anti-bacterial wipes or spray
- Wet-wipes, towellettes
- Feminine supplies
- Shovel
- Dish & hand soap & hand sanitizer
- Personal Hygiene Items

Earthquakes: Planning Ahead

- Evacuation
- Earthquakes may require you to leave the area…quickly!
- Prepare an Emergency Evacuation Kit.
- Make a plan now, plan a route, setup rendezvous locations in case you get separated.

Earthquakes: Things to Know

•Contact your local emergency management office or American Red Cross chapter for more information on earthquakes

•Teach children how and when to call 9-1-1, police, or fire department and which radio station to tune to for emergency information

•Teach all family members how and when to turn off gas, electricity, and water

•Have disaster supplies on hand

•Develop an Emergency Communication Plan and Emergency Supply Kit.

Earthquakes: Preparedness

•Properly preparing for an earthquake has additional value than just being ready for an earthquake itself.

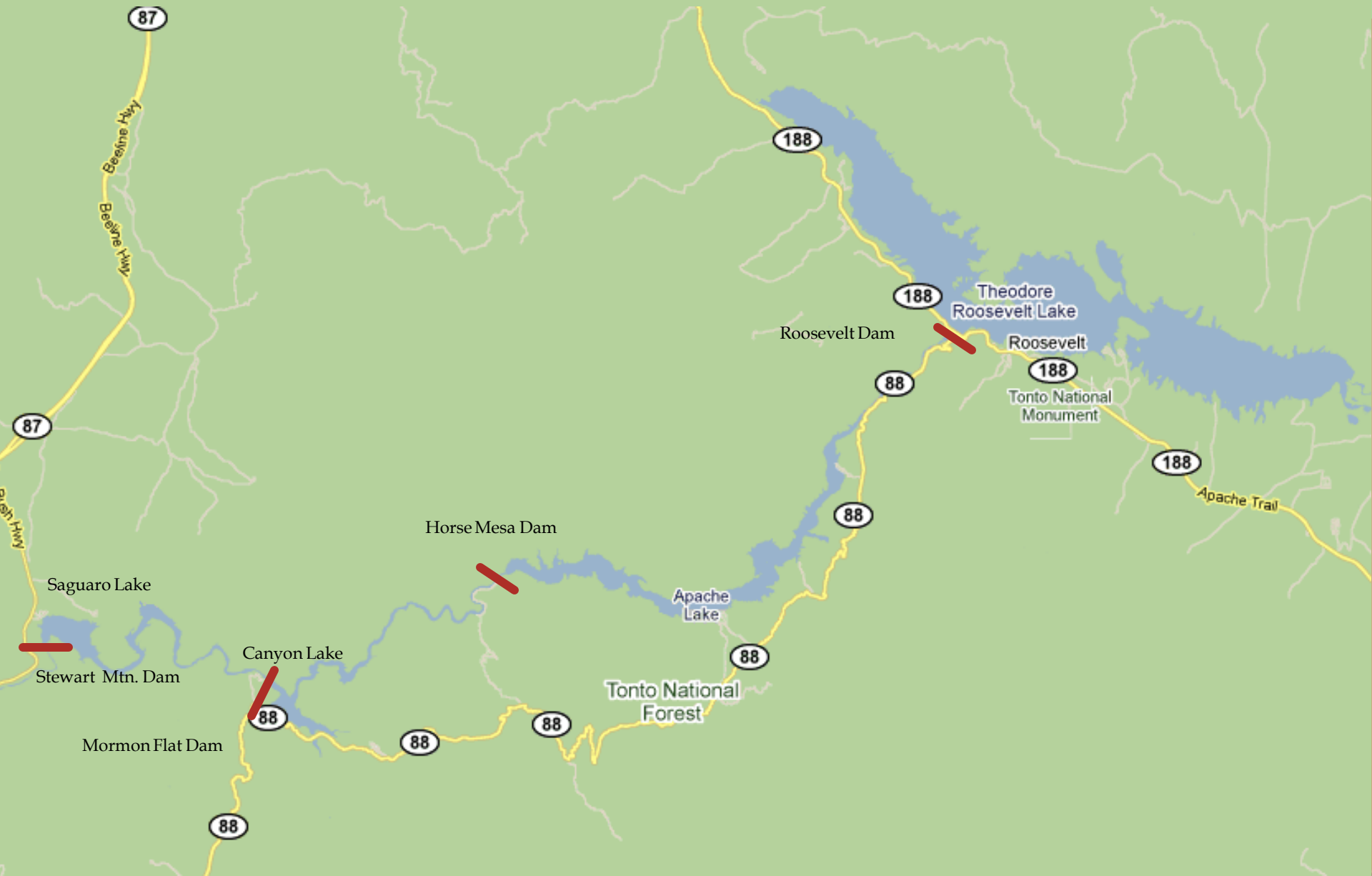
•Earthquake preparations translate to the same preparations needed for perhaps 75% of all possible scenarios you might prepare for.

Floods

Floods

- Floods are one of the most common natural disasters.
- They can develop slowly due to sustained rain fall, or can happy quickly due to flash floods or dam failures.
- Floods are possible in all low-lying areas, flood basins, valleys or near rivers, streams, creeks and washes or downstream from a dam.

Superstition Area Reservoirs



Flood Risk

- Go to: FloodSmart.gov to view, print or order your Flood Risk Assessment maps.
- Determine the chance of a flood in your area.
- If you wish, you can also purchase flood insurance from the National Flood Insurance Program.
- Flood losses are not covered under homeowners' insurance policies.
  - There is a 30-day waiting period before flood insurance goes into effect, so don't wait until its raining to buy flood insurance.

NATIONAL FLOOD INSURANCE PROGRAM FloodSmart.gov The official site of the NFIP

OTHER FLOOD AREAS

ZONE X Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

Flood Risk: Higley, AZ. Area

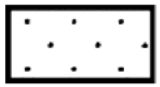
- 0.2% Annual Chance of Flood = 500 Year Storm.

or

- 1% Annual Chance of Flood = 100 Year Storm. With Depths up to 1 foot. Or relatively small drainage area.

or

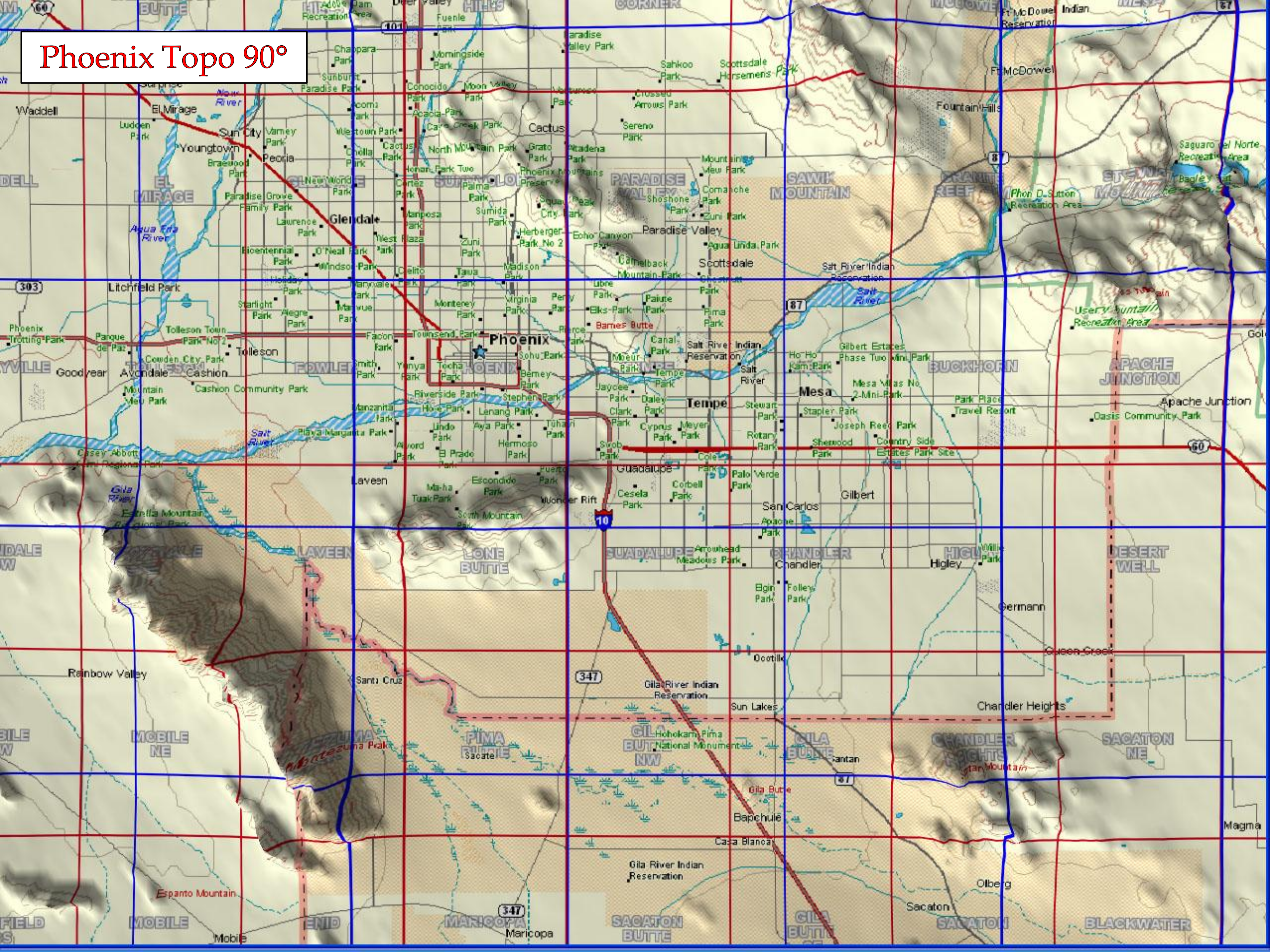
- 1% Annual Chance of Flood = 100 Year Storm. With levee protection.



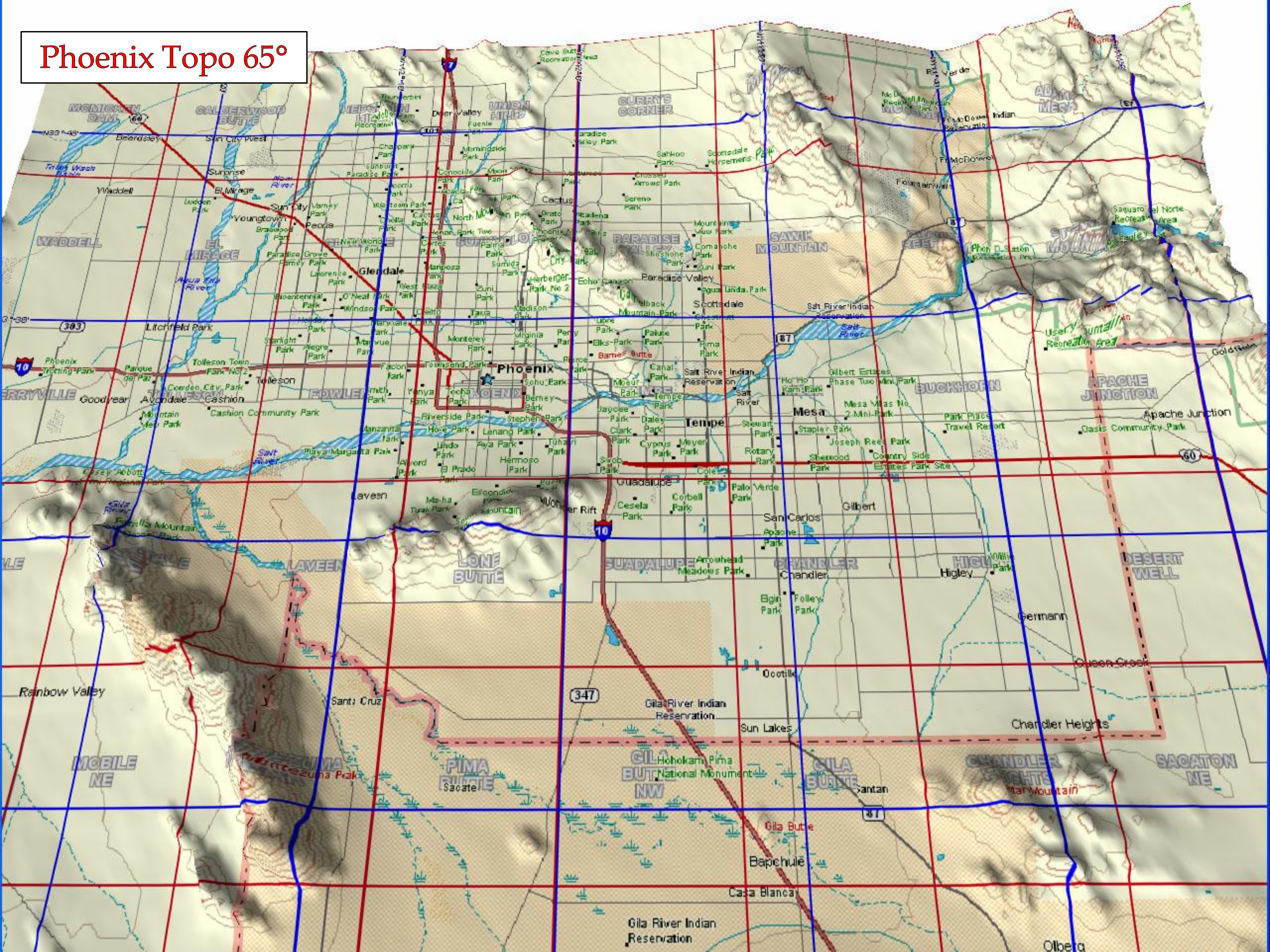
OTHER FLOOD AREAS

ZONE X Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

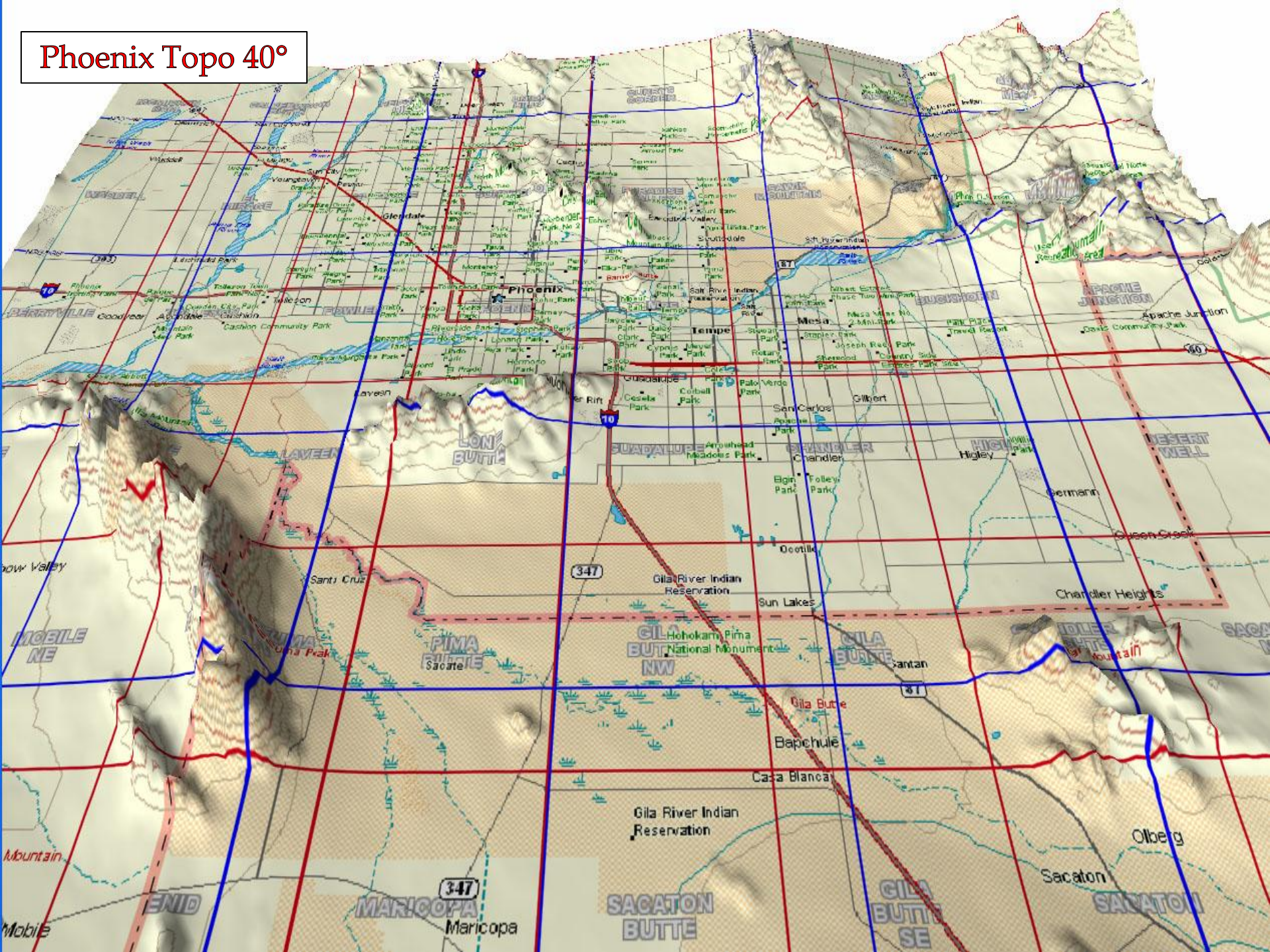
Phoenix Topo 90°



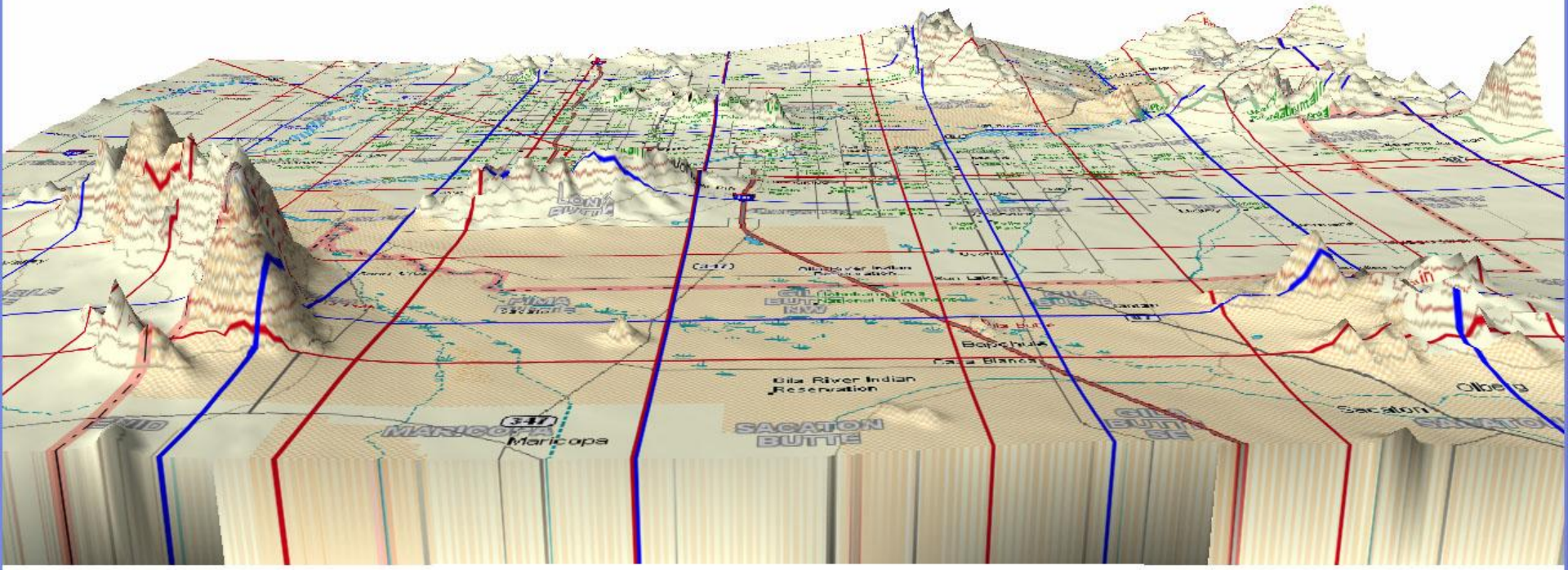
Phoenix Topo 65°

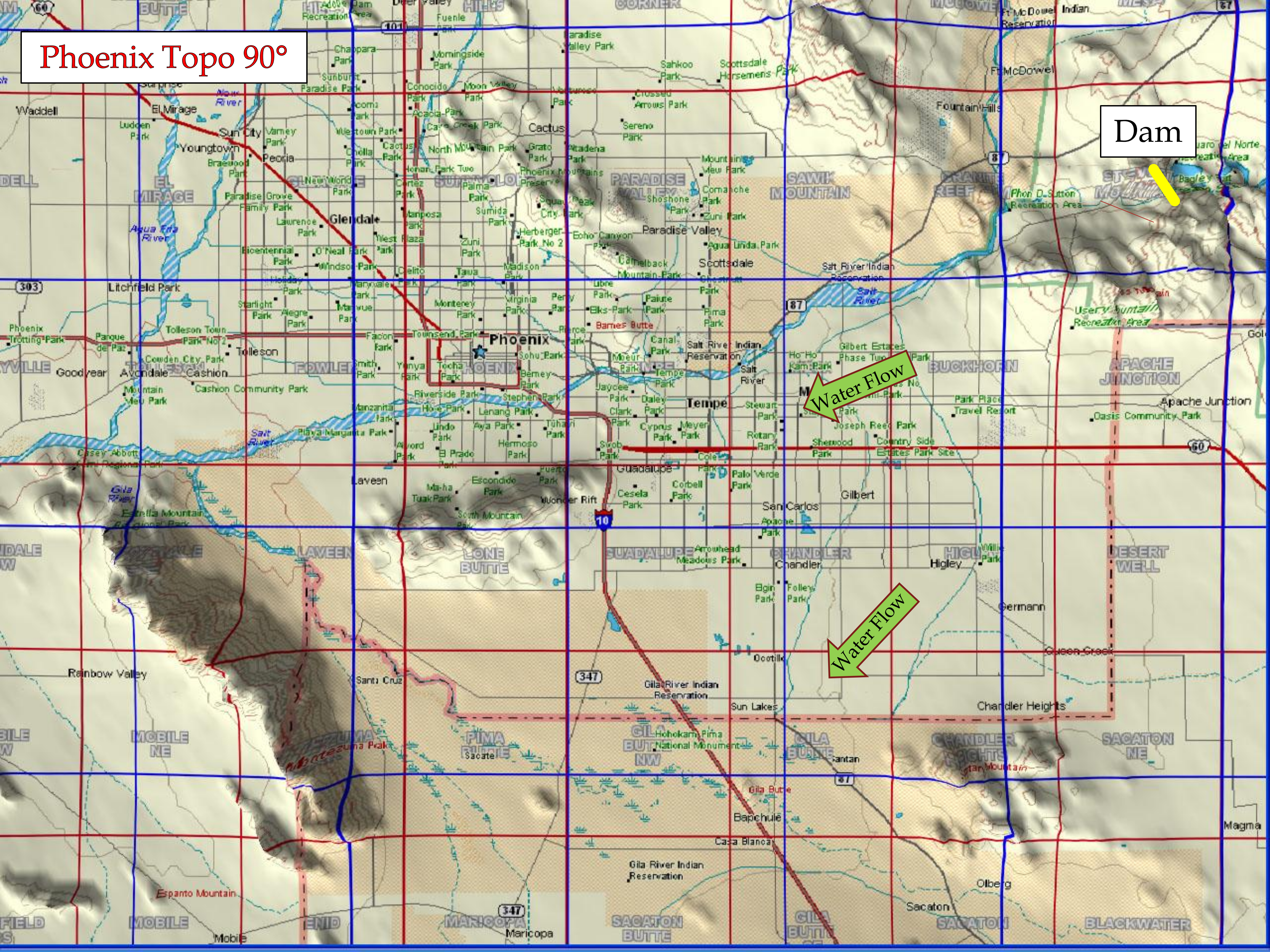


Phoenix Topo 40°

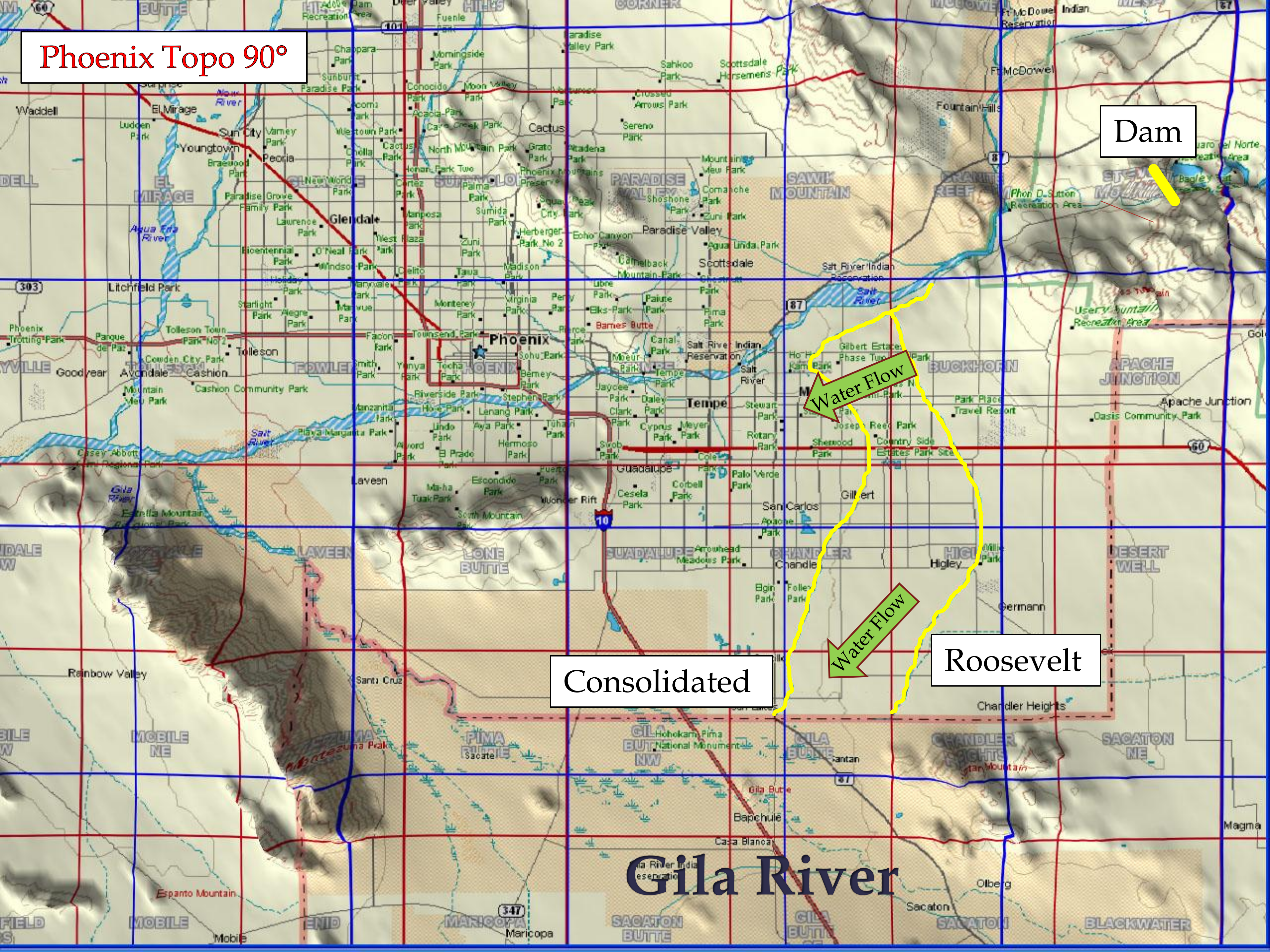


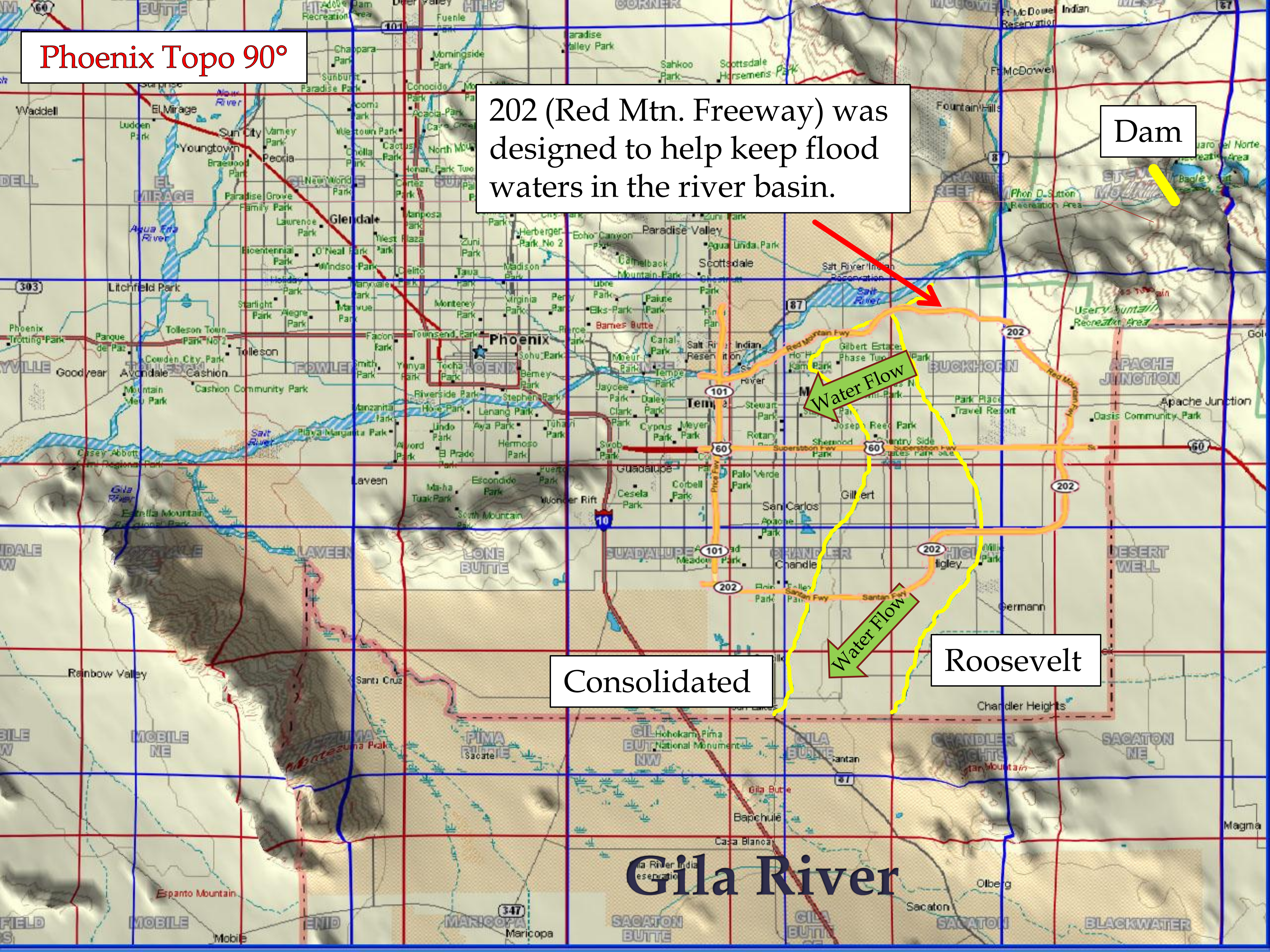
Phoenix Topo 15°

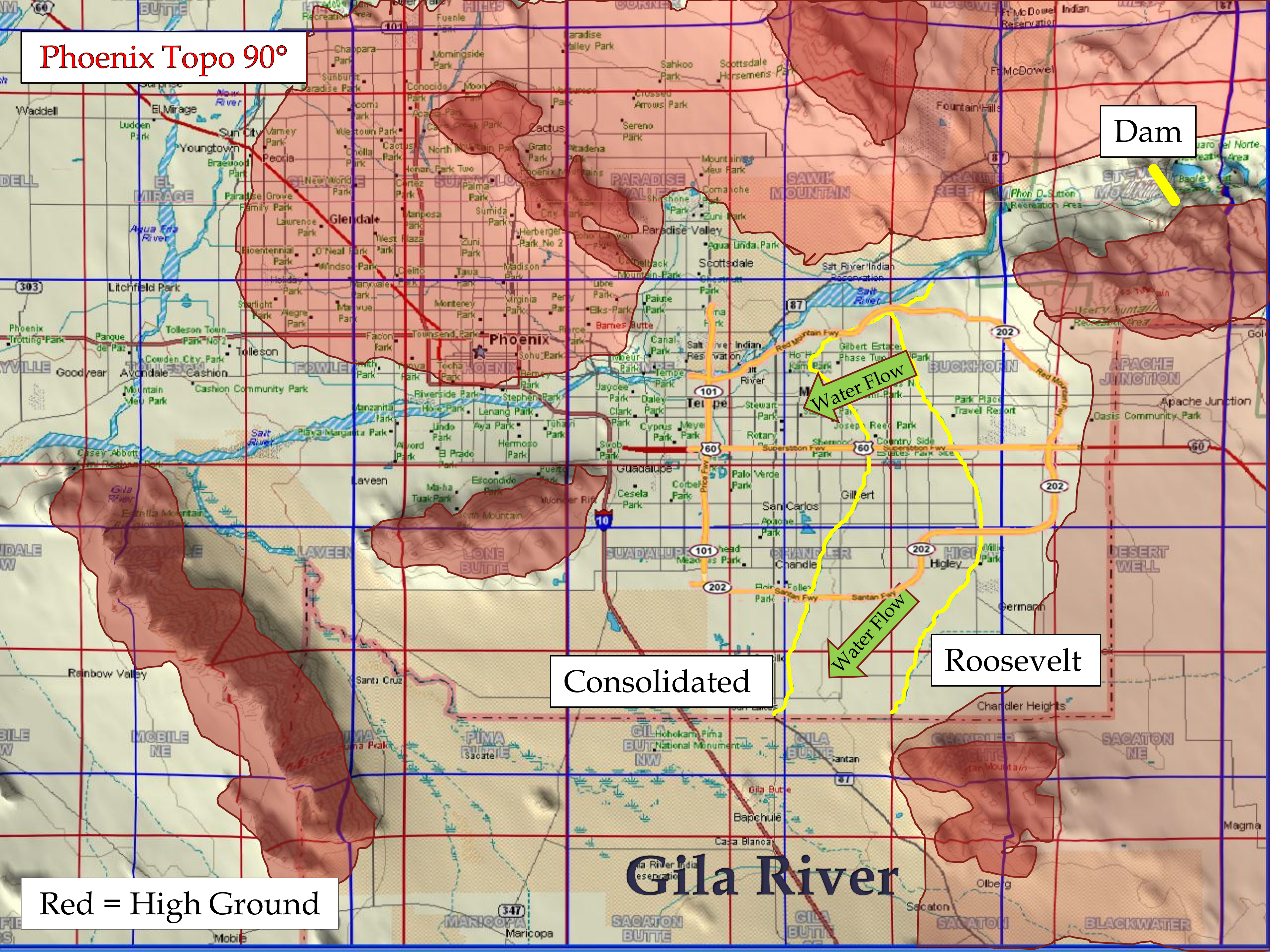




Phoenix Topo 90°
Dam
Water Flow
Water Flow
Phoenix
Glendale
Peoria
Tempe
Scottsdale
Paradise Valley
Fountain Hills
Apache Junction
Gilbert
Chandler
Higley
Queen Creek
Chandler Heights
Sun Lakes
Laveen
Guadalupe
Tolleson
Goodyear
Avondale
Cashion
Litchfield Park
Waddell
El Mirage
Youngtown
Sun City
Rainbow Valley
Santa Cruz
Maricopa
Mobile
Sacaton
Olberg
Bapchule
Casa Blanca
Santan
Magma
Germann
Ocotillo
Gila River Indian Reservation
Salt River Indian Reservation
Salt River
Gila River
Agua Fria River


Phoenix Topo 90°
Dam
Water Flow
Water Flow
Consolidated
Roosevelt
Gila River
Phoenix
Glendale
Scottsdale
Tempe
Paradise Valley
Fountain Hills
Apache Junction
Gilbert
Chandler
Higley
Chandler Heights
Litchfield Park
Goodyear
Avondale
Tolleson
Laveen
Guadalupe
Peoria
Sun City
El Mirage
Youngtown
Waddell
Rainbow Valley
Maricopa
Mobile
Sacaton
Bapchule
Casa Blanca
Olberg
Magma
Germann
Salt River
Agua Fria River
Gila River


Phoenix Topo 90°
202 (Red Mtn. Freeway) was designed to help keep flood waters in the river basin.
Dam
Water Flow
Water Flow
Consolidated
Roosevelt
Gila River


Phoenix Topo 90°
Dam
Water Flow
Water Flow
Consolidated
Roosevelt
Gila River
Red = High Ground

Floods: Before the Flood

- To avoid flood dangers, do not build your home in a flood zone.
- Just like your Earthquake Preparations, prepare your 90 Day Food Supply, Evacuation Kit, Evacuation Plan and Medical Supplies.
- Also plan to get by without utilities: Cooking, Fuel, Water, Lighting, Sanitation, etc…

Floods: Before the Flood

- Communication: In case of flash flooding or dam failure, a few minutes may be all you have to get to safety.
- NOAA radios with S.A.M.E. technology can alert you anytime, day or night in case of an emergency. (~$35)

All Hazards NOAA Weather Radio
NOAA's National Weather Service™

Floods: During the Flood

- If you suspect a flood is likely to occur in your area, listen to the radio or T.V. for updates and instructions.
- Move whatever essential belongings you can upstairs…time permitting.
- If instructed, turn off your utilities at the main valves or switches.

Floods: During the Flood (Evacuation)

- If you think a flash flood might be likely, quickly get to higher ground.
- Be aware when crossing rivers, streams, creeks and washes if floods are likely to occur.
- Never try to cross through flooded washes or roads.
- Six inches of water will reach the bottom of most passenger cars causing loss of control and possible stalling.
- A foot of water will float many vehicles.
- Two feet of rushing water can carry away most vehicles Including SUV's and pick-ups.

Floods: After the Flood

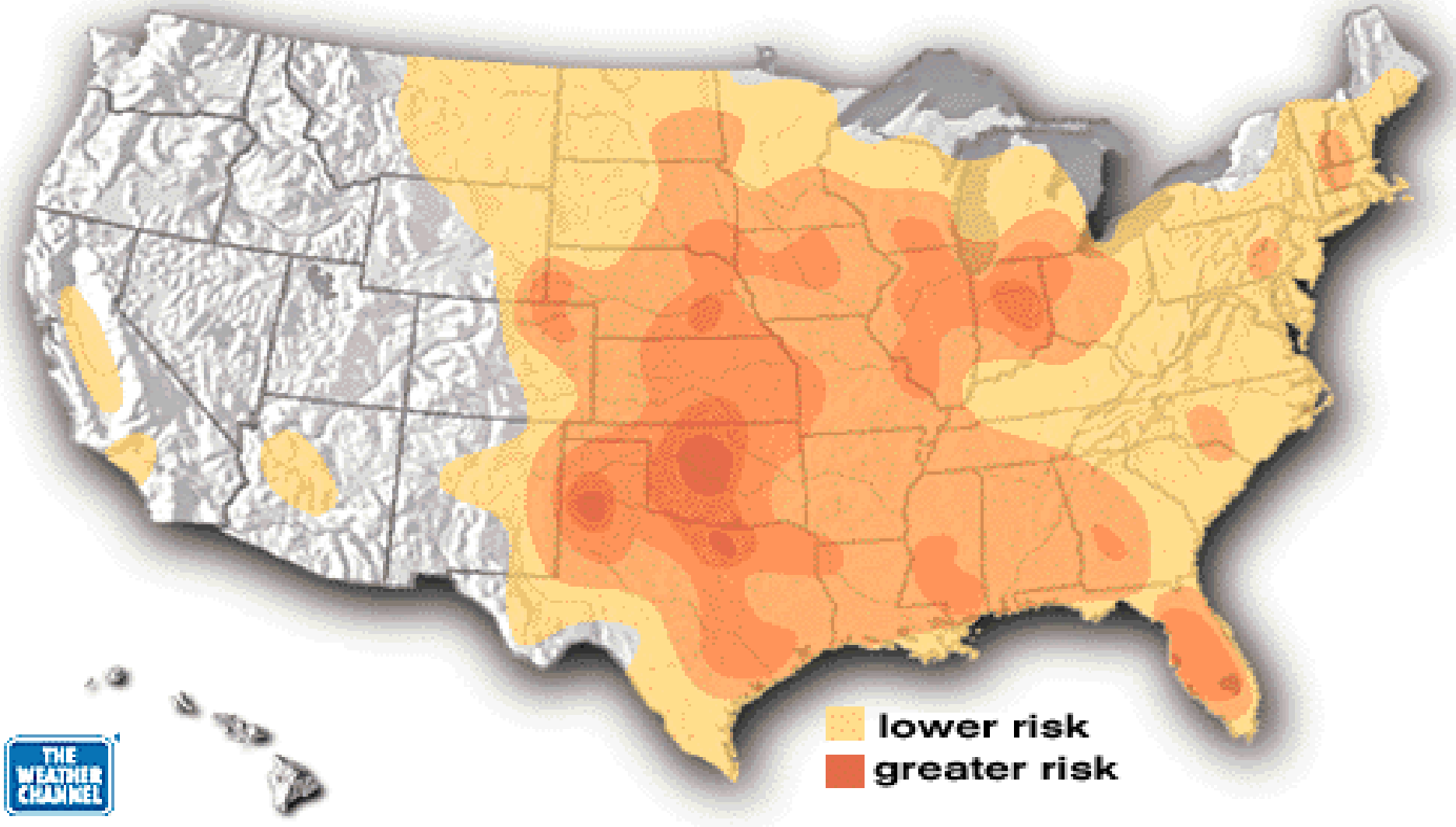
- Listen for news reports to learn whether the community's water supply is safe to drink.
- Avoid floodwaters; water may be contaminated by oil, gasoline, or raw sewage. Water may also be electrically charged from underground or downed power lines.
- Avoid moving water.
- Be aware of areas where floodwaters have receded. Roads may have weakened and could collapse under the weight of a car.
- Stay away from downed power lines, and report them to the power company.
- Return home only when authorities indicate it is safe.
- Stay out of any building if it is surrounded by floodwaters.
- Use extreme caution when entering buildings; there may be hidden damage, particularly in foundations.
- Service damaged septic tanks, cesspools, pits, and leaching systems as soon as possible. Damaged sewage systems are serious health hazards.
- Clean and disinfect everything that got wet. Mud left from floodwater can contain sewage and chemicals.

http://www.fema.gov/areyouready/flood.shtm

Tornadoes

TORNADO INCIDENCE MAP

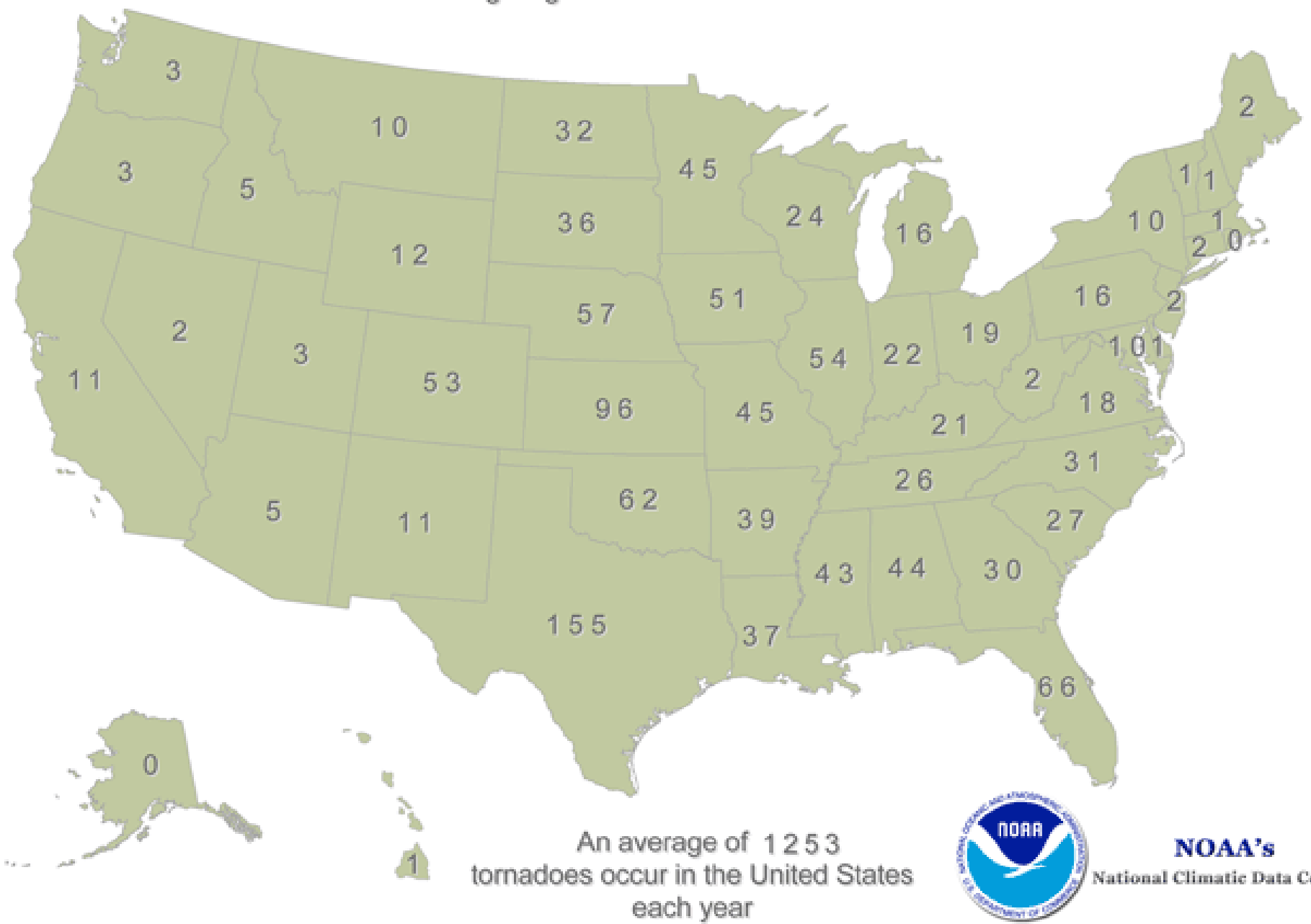
Areas which are most at risk



Source: "The Thunderstorm in Human Affairs" 2nd Edition, Edwin Kessler, Editor University of Oklahoma Press, Norman, OK, 1983

Average Annual Number of Tornadoes

Averaging Period: 1991 - 2010



An average of 1253 tornadoes occur in the United States each year

NOAA's National Climatic Data Center

Tornadoes Can Happen Anywhere

• Tornadoes have been reported in every state, and though they generally occur during spring and summer, they can happen any time of the year.

• There are no areas immune to tornadoes; they have been reported in mountains and valleys, over deserts and swamps, from the Gulf Coast into Canada, in Hawaii and even Alaska.

• Regardless of the location or time of year, if conditions are right, a tornado can happen.

•Over 1,200 tornadoes are reported annually nationwide, and as our tornado detection systems improve, more are being reported each year.

•However, sometimes tornadoes will develop in areas in which no tornado watch or warning is in effect, so stay alert for changing weather conditions.

Tornadoes in Arizona

229 Tornadoes were reported in Arizona between **01/01/1950** and **12/31/2010**

Total Losses:

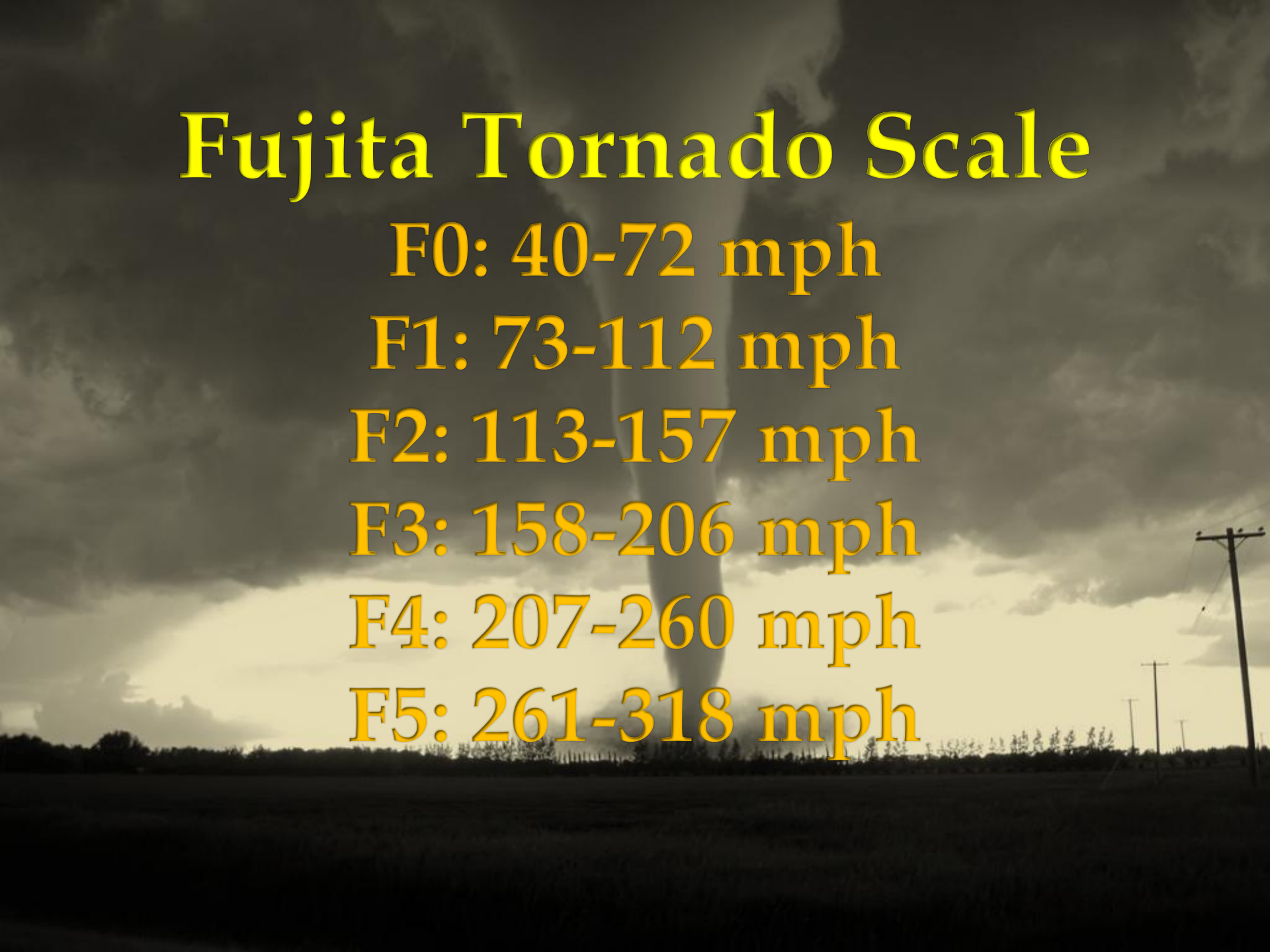
- 3 Deaths
- 143 Injuries
- $46.465 Million in Property Damage
- $30 Thousand in Crop Damage

Tornadoes in Arizona (By County)

229 Tornadoes were reported in Arizona between **01/01/1950** and **12/31/2010**

County:	
Apache	13
Cochise	14
Coconino	34
Gila	3
Graham	0
Greenlee	0
La Paz	0
Maricopa	58

County:	
Mohave	14
Navajo	16
Pima	20
Pinal	25
Santa Cruz	0
Yavapai	23
Yuma	11
Total:	218


Fujita Tornado Scale
F0: 40-72 mph
F1: 73-112 mph
F2: 113-157 mph
F3: 158-206 mph
F4: 207-260 mph
F5: 261-318 mph

Tornadoes: Know the Signs

TORNADO WATCH

Atmospheric conditions are favorable for a tornado to possibly occur. Issued for 4 to 8 hours and covers a large portion of the state.

TORNADO WARNING

A tornado has been spotted in the area and immediate action should be taken. Move away from windows and outside walls. Duration is one hour unless otherwise canceled. It is strongly advised that you to seek shelter in the event of a Tornado WARNING.

Tornadoes: Know the Signs

Weather forecasting science is not perfect and some tornadoes do occur without a tornado warning. There is no substitute for staying alert to the sky. Besides an obviously visible tornado, here are some things to look and listen for:

1. Strong, persistent rotation in the cloud base.
2. Whirling dust or debris on the ground under a cloud base -- tornadoes sometimes have no funnel!
3. Hail or heavy rain followed by either dead calm or a fast, intense wind shift. Many tornadoes are wrapped in heavy precipitation and can't be seen.
4. Day or night - Loud, continuous roar or rumble, which doesn't fade in a few seconds like thunder.
5. Night - Small, bright, blue-green to white flashes at ground level near a thunderstorm (as opposed to silvery lightning up in the clouds). These mean power lines are being snapped by very strong wind, maybe a tornado.
6. Night - Persistent lowering from the cloud base, illuminated or silhouetted by lightning -- especially if it is on the ground or there is a blue-green-white power flash underneath.

Tornadoes: Before A Tornado

- Turn on local TV, radio or NOAA Weather Radio and stay alert for warnings.
- Many weather alert radios have alarms that can wake you if you are asleep.
- In places you frequent often, learn where there are bathrooms, storage rooms or other interior shelter areas away from windows, and the shortest ways to get there.
- Have food, water, fuel and first aid supplies on-hand in case services are not available following a tornado.

Tornadoes: During A Tornado

A Word of Caution:

All tornado safety measures are no more than suggestions. Inside a tornado, there is no guaranteed safety. The most violent tornadoes can destroy any building…and its occupants.

Tornadoes: During A Tornado

Inside a building:

- Flying debris is the greatest danger in Tornadoes.

- Avoid windows.

- Go to the basement, lowest floor, small center room (like a bathroom or closet), under a stairwell, or in an interior hallway or room with no windows. Go to the center of the room. Stay away from corners because they tend to attract debris.

Tornadoes: During A Tornado

Inside a building:

• Crouch as low as possible to the floor, facing down; and cover your head with your hands.

• Get under some kind of sturdy protection (heavy table or work bench), or cover yourself with a mattress or sleeping bag.

• Know where very heavy objects rest on the floor above (pianos, refrigerators, waterbeds, etc.) and do not go under them. They may fall down through a weakened floor and crush you.

Tornadoes: During A Tornado

If you are in a vehicle or outdoors:

• If the tornado is visible do not try to outrun it. It is impossible to predict its path or where other tornadoes will form nearby. Park the car as quickly and safely as possible and find shelter.

•If in the open country, run to low ground away from any cars. Lie flat and face-down, protecting the back of your head with your arms.

•Avoid seeking shelter under bridges, which offer little protection against flying debris.

Tornadoes: After A Tornado

- Listen to the radio for instructions through the Emergency Alert System (EAS).
- Wait for emergency personnel to arrive.
- Provide first aid to the injured.
- Stay away from power lines and puddles with wires in them; they may still be carrying electricity!
- Watch your step to avoid broken glass, nails, and other sharp objects.
- Stay out of any heavily damaged houses or buildings; they could collapse at any time. Turn off utilities if lines are broken.
- Do not use matches or lighters, in case of leaking natural gas pipes or fuel tanks nearby.

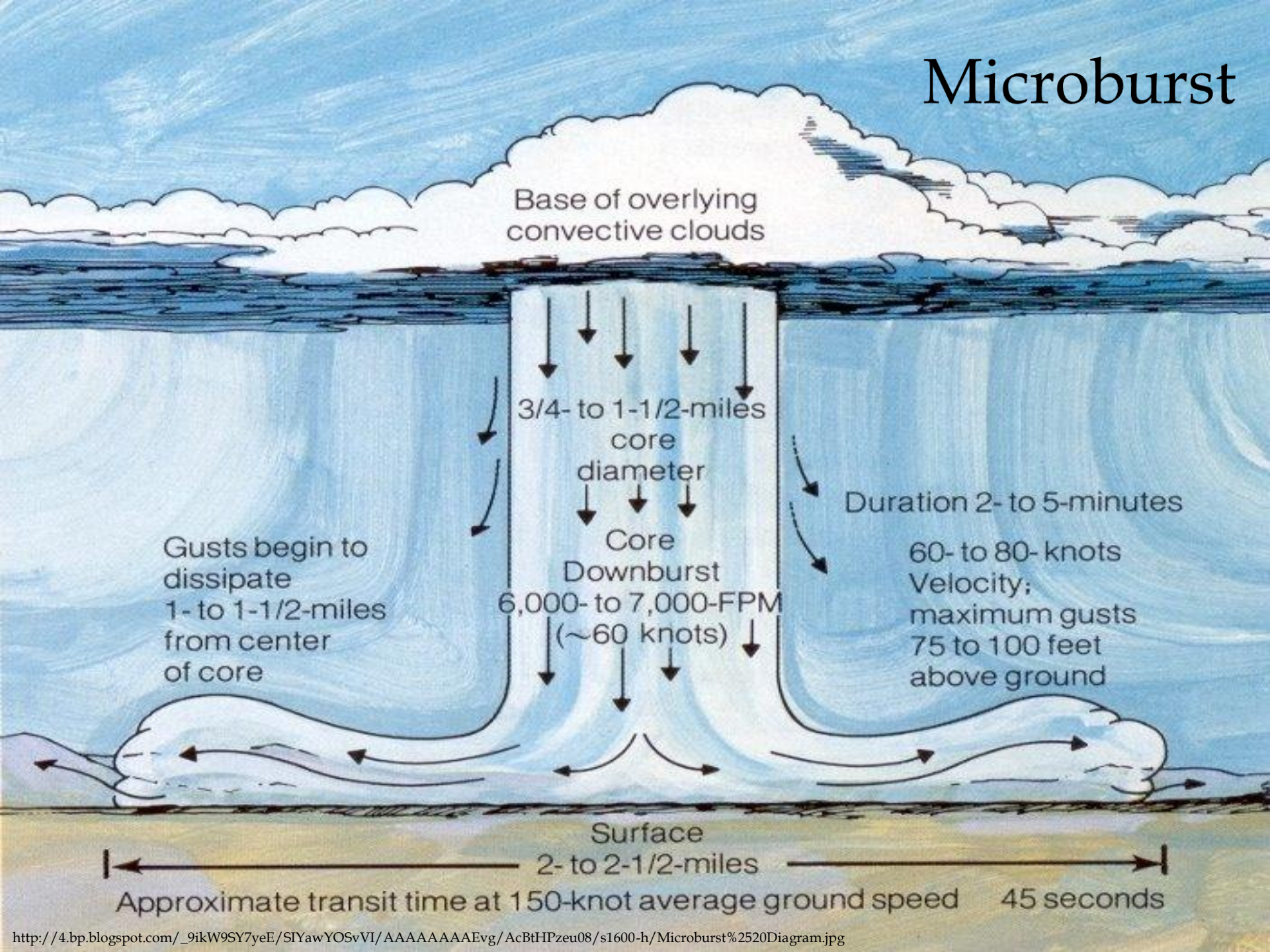

Microbursts
(or Severe Thunderstorms)

What is a Microburst?

- A microburst is a small, very intense downdraft that descends to the ground resulting in a strong wind divergence. The size of the event is typically less than 2 miles across. Microbursts are capable of producing winds of more than 150 mph causing significant damage. The life span of a microburst is around 5-15 minutes.
- When rain falls below the cloud base or is mixed with dry air, it begins to evaporate and this evaporation process cools the air. The cool air descends and accelerates as it approaches the ground. When the cool air approaches the ground, it spreads out in all directions and this divergence of the wind is the signature of the microburst. In humid climates, microbursts can also generate from heavy precipitation.

http://phoenix.about.com/cs/weather/g/microburst.htm

Microburst



http://4.bp.blogspot.com/_9ikW9SY7yeE/SIYawYOSvVI/AAAAAAAAEvg/AcBtHPzeu08/s1600-h/Microburst%2520Diagram.jpg

Microbursts or Other Severe Storms

Before the Storm:

• Remove dead or rotting trees and branches that could fall and cause injury or damage during a severe thunderstorm or microburst.

• Pick a "safe place" in your home where family members can gather during a thunderstorm. A place where there are no windows, skylights, or glass doors, which could be broken by strong winds or hail, causing damage or injury. Severe thunderstorms do, at times, produce tornadoes.

• Take a first aid and CPR course to learn how to treat burns and how to give rescue breathing and administer CPR. Train the entire family because severe thunderstorms can strike almost anywhere at anytime.

• Discuss severe thunderstorms with your family. Everyone should know what to do in case all family members are not together. Discussing disaster ahead of time helps reduce fear and lets everyone know how to respond during an emergency.

Microbursts or Other Severe Storms

During a Severe Thunderstorm (Inside):

• Avoid contact with corded phones, electrical equipment or cords or plumbing (Do not wash your hands, take a shower, wash dishes or do laundry). These can conduct electricity.

• Stay away from windows and doors, stay off porches, do not lie on concrete floors and do not lean against concrete walls.

• Shutter windows and secure outside doors. If shutters are not available, close window blinds, shades, or curtains.

• Unplug appliances and other electrical items such as computers and turn off air conditioners. Power surges from lightning can cause serious damage.

• Use your battery-operated NOAA Weather Radio for updates from local officials.

Microbursts or Other Severe Storms

During a Severe Thunderstorm (Outside):

• Postpone outdoor activities. Lightning, hail or flying debris can cause serious injury or death.

• Get inside a home, building, or hard top automobile (not a convertible). Although you may be injured if lightning strikes your car, you are much safer inside a vehicle than outside.

• Remember, rubber-soled shoes and rubber tires provide NO protection from lightning. However, the steel frame of a hard-topped vehicle provides increased protection if you are not touching metal.

Avoid the following:

• Natural lightning rods such as a tall, isolated tree in an open area.

• Hilltops, open fields, the beach, or a boat on the water.

•Isolated sheds or other small structures in open areas.

•Anything metal—tractors, farm equipment, motorcycles, golf carts, golf clubs, and bicycles.

Microbursts or Other Severe Storms

During a Severe Thunderstorm (Outside):

• If you can't get indoors, seek shelter in a low area under a thick growth of small trees.
•In an open area go to a low place such as a ravine or valley.
•Be alert for flash floods.
•On open water get to land and find shelter immediately.
•Anywhere you feel your hair stand on end (which indicates that lightning is about to strike) Squat low to the ground on the balls of your feet. Place your hands over your ears and your head between your knees. Make yourself the smallest target possible and minimize your contact it the ground. DO NOT lie flat on the ground.

Microbursts or Other Severe Storms

What to Do After a Thunderstorm:

• Turn off utilities if lines are broken.

•Provide first aid and call 9-1-1 for anyone severely injured.

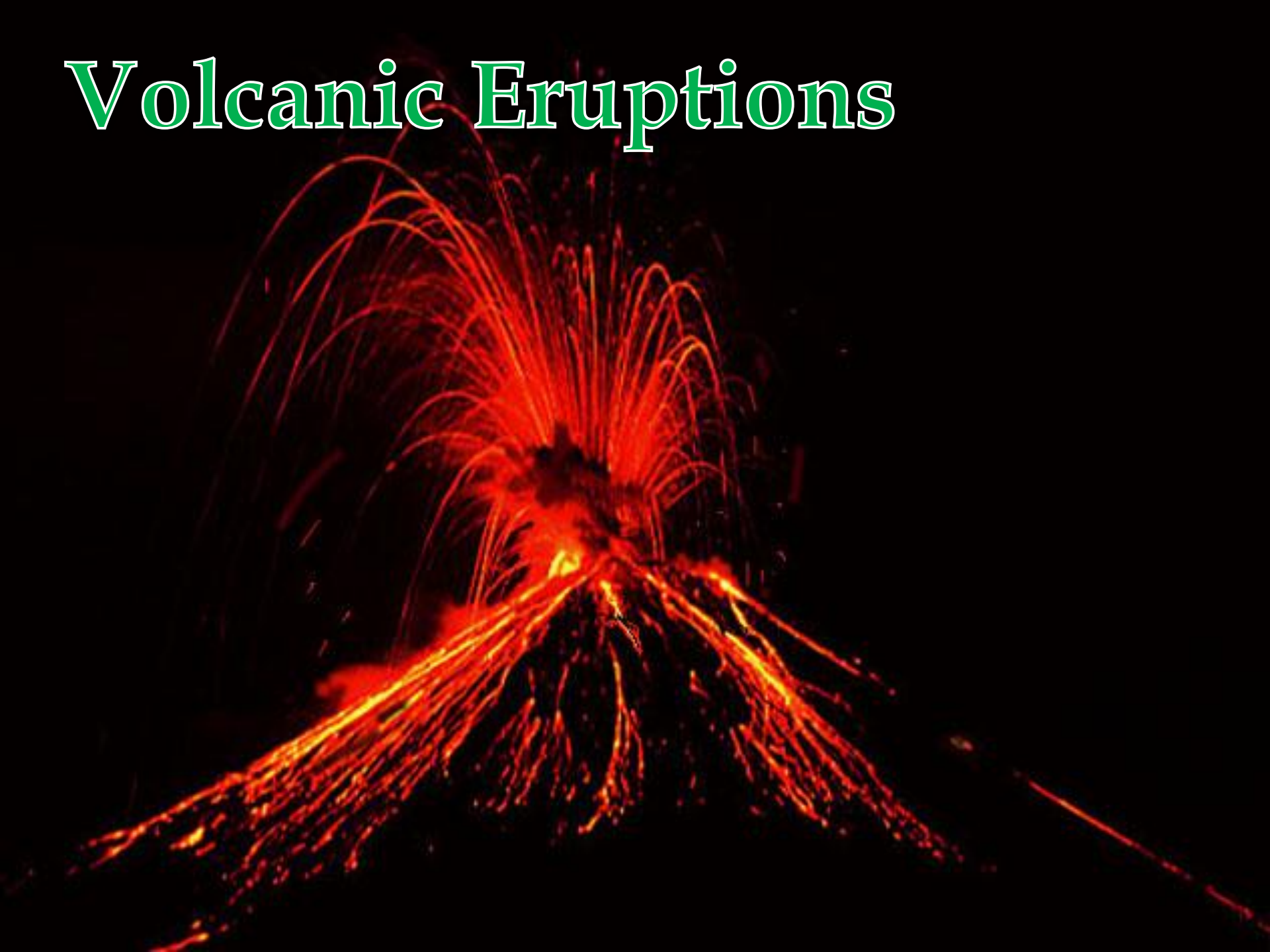
•The following are things you should check when you attempt to give aid to a victim of a lightning strike :

•Breathing - if breathing has stopped, begin mouth-to-mouth resuscitation.

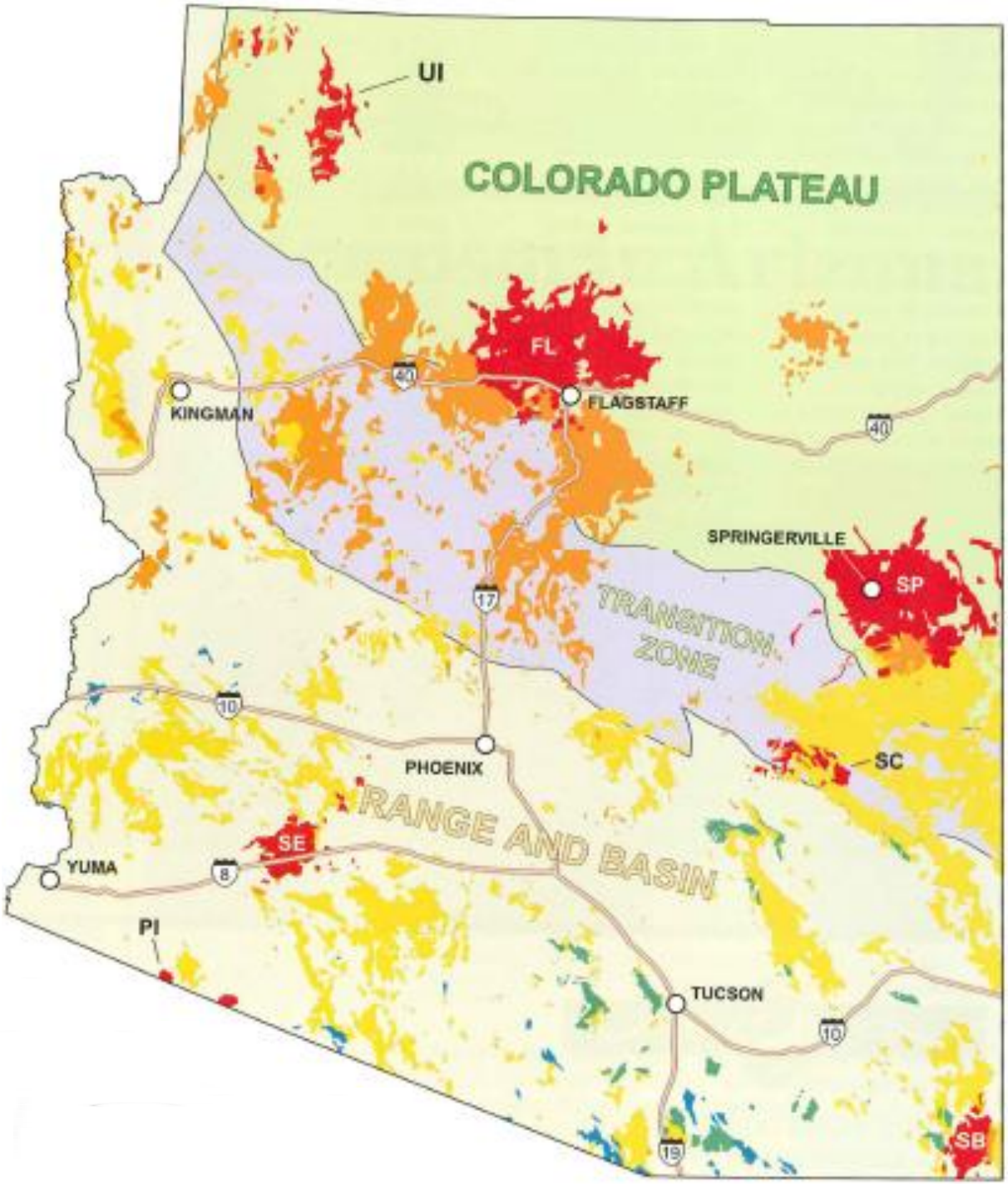
•Heartbeat - if the heart has stopped, administer CPR.

•Pulse - if the victim has a pulse and is breathing, look for other possible injuries. Check for burns where the lightning entered and left the body. Also be alert for nervous system damage, broken bones, and loss of hearing and eyesight.

Volcanic Eruptions



Volcanic Activity In Arizona



VOLCANIC FIELDS	AGE OF VOLCANISM (million years)
Uinkaret (UI)	0-4
Flagstaff (FL)	5-16
Springerville (SP)	11-38
San Carlos (SC)	50-82
San Bernardino (SB)	160-200
Sentinel (SE)	
Pinacate (PI)	

Volcanoes

• Geologists consider the San Francisco Volcanic Field (Flagstaff) to be potentially active because eruptions have taken place less than a 1000 years ago, which in geologic terms, is practically yesterday.

• The Sunset Crater eruption took place between 1080-1150 AD. The Sunset Crater eruption produced a blanket of ash and lapilli (gravel) covering an area of more than 2100 sq km and forced the abandonment of settlements of the indigenous Sinagua Indians.

Volcanoes

Does Arizona have a volcano hazard?

Geologically, the volcanic activity that took place in Arizona during the last 4 million years is very young. Those volcanic fields that are less than 4 million years old should probably be considered dormant, but not extinct. Volcanoes do not usually erupt without giving some type of warning. Warning signals include frequent small earthquakes caused by upward movement of molten rock *(magma)*. The land surface might even bulge slightly. Shallow magma heats ground water, commonly enough to cause it to boil. Hot springs are common. In addition, gases such as carbon dioxide that are associated with magma might bubble from the ground and, if sufficiently concentrated, even cause plants to die. Although "swarms" of small earthquakes have occurred near the Grand Canyon, seismologists do not attribute them to the movement of magma. No evidence suggests that magma is currently moving toward the surface in Arizona.

http://www.azgs.az.gov/Hazards_ocr/volcanos/Volcanism%20in%20Arizona-2000.pdf

Tsunami

Tsunami

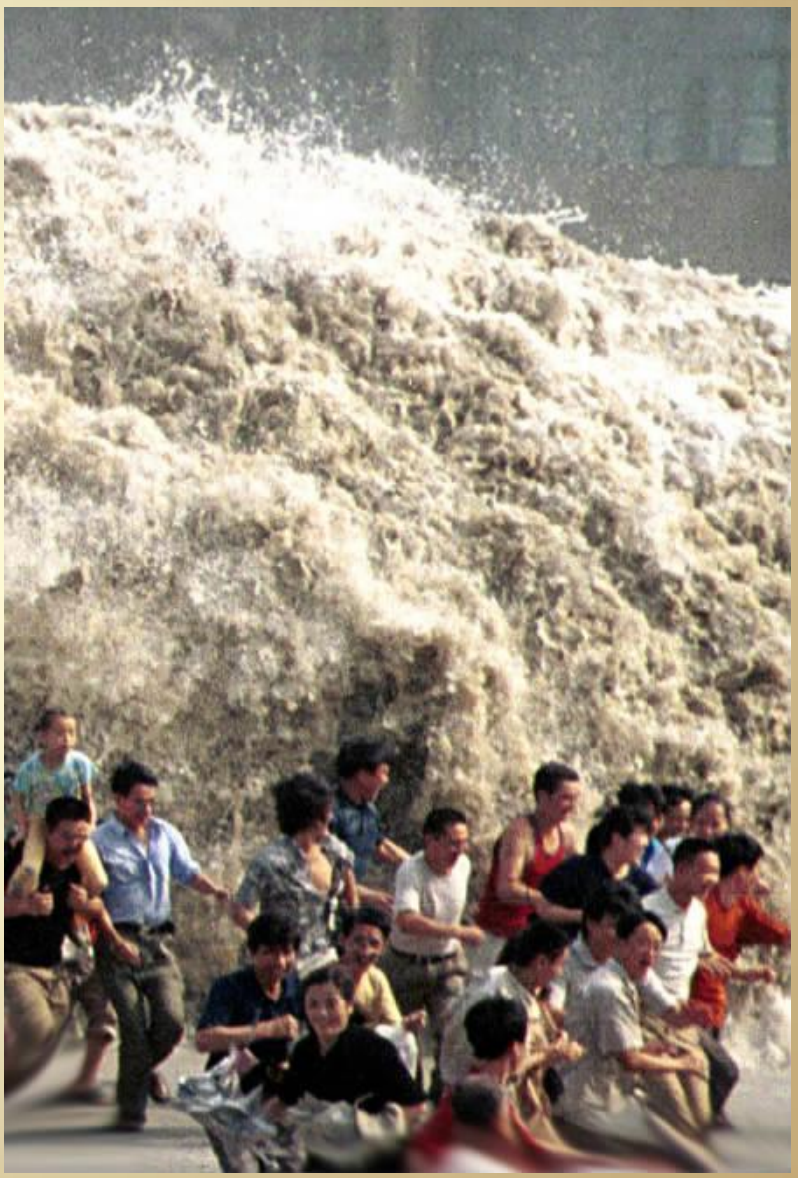
- If you hear about an incoming Tsunami in Arizona, all you'll need is one of these…

Tsunami

- A Tsunami in California can have a serious impact on Arizona.

- The economic impact from a catastrophic southern California Tsunami would disrupt approximately 60% of Arizona's fuel and 90% of Arizona's food goods.

- Large numbers of potential refugees could consume our resources very quickly.



Drought

Drought

- We live in the desert. Droughts have happened before and will happen again.
- Control your water usage and don't waste it.
- Store at least 2 weeks of potable water for your family. (2 Gallons per Day)
- If you are able, store 90 Days worth of drinking water.
- Also plan ways to filter and purify water you may find.

Contact Information:

Jon Sherman

Email:
iwillprepare@gmail.com

Website:

www.iwillprepare.com
Emergency Preparedness