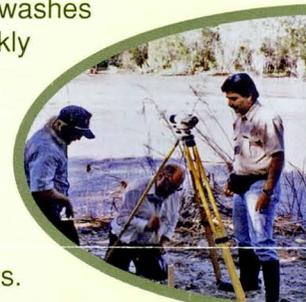
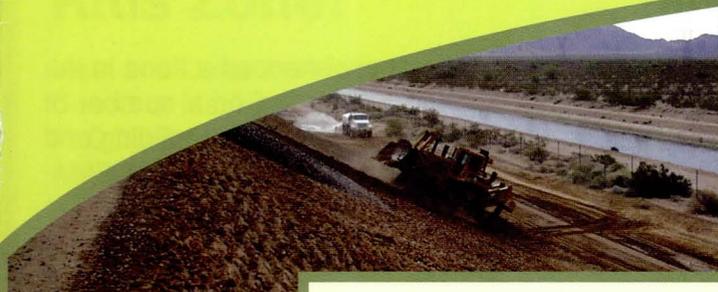




2014

FLOOD FACTS

CRS Activity 330



The Flood Control District of Maricopa County (District) has been responsible for overseeing the development and implementation of comprehensive flood hazard control measures in Maricopa County since 1959. The District was formed by the Arizona State Legislature in response to significant flooding events that plagued Maricopa County during its early history.

The area's Sonoran Desert environment is conducive to flooding due to unique soil and topography characteristics, winter/summer rainy seasons and numerous natural riverbeds, washes and channels. During a rainstorm, these normally dry waterways can quickly become raging rivers causing widespread overland flooding when unchecked.

Initially the District focused on building dams (flood retarding structures), basins and channels to prevent flooding. However unprecedented population growth and development in the county since the 1990s shifted the District's emphasis to inform citizens about flood hazards, identify specific hazard areas and control development that directly impacts waterways.

The County Board of Supervisors serve as the District's Board of Directors. They in turn have appointed the Flood Control Advisory Board (made up of county citizens) to review and make recommendations to the Board of Directors regarding District projects. Ongoing projects and long-term planning efforts by the District guarantee residents of Maricopa County the benefits of a natural environment and protection from the effects of flooding.

INDEX

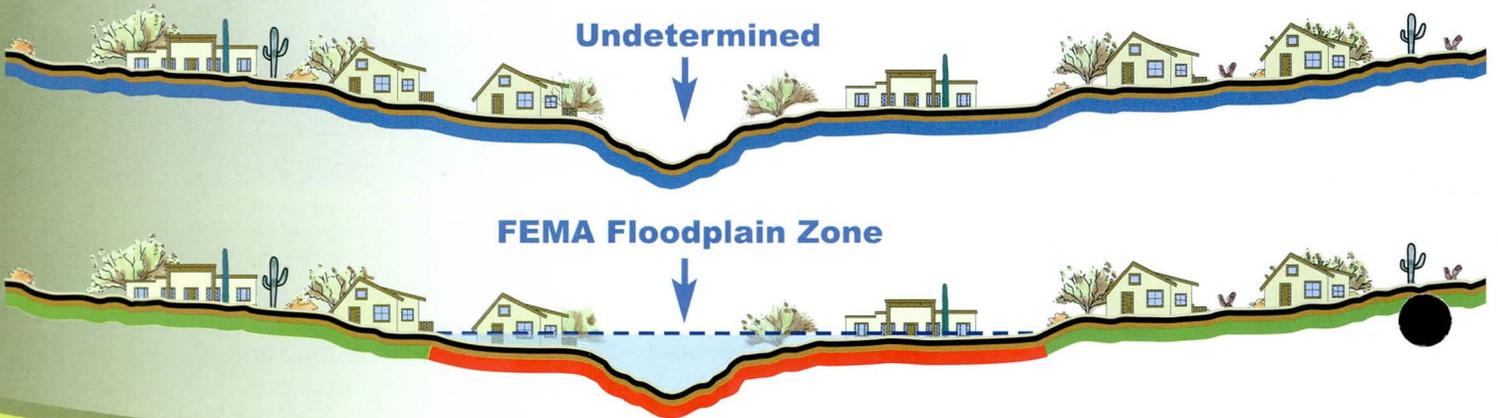
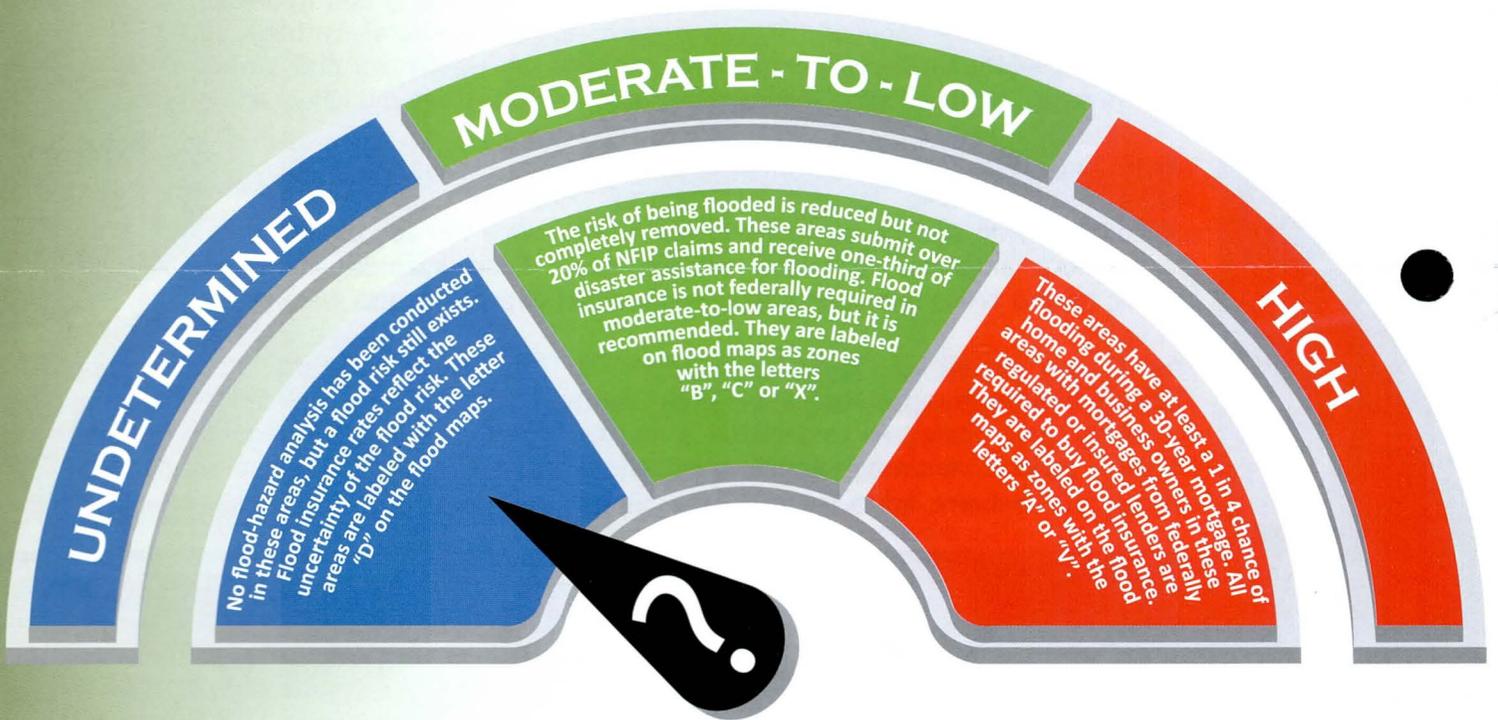
Introduction	1	Floodplains of Maricopa County Map	8-9
Flood Hazard and Risk	2	Flood Safety	10
Flood Insurance	4	Protect Natural Floodplain Functions	13
Substantial Improvement and Damage	5	Web Tools	14
District Flood Warning	6	Kids Zone	15
Permitting and Building Responsibility	7		

Flood Hazard and Risk

Floods are the most common hazards in the United States. Just because you have not experienced a flood in the past doesn't mean you won't in the future. Flood risk is not just based on history; it is also based on a number of factors: rainfall, river-flow and tidal-surge data, topography, flood-control measures and changes due to building and development. The question to ask yourself is "Am I prepared"?

This is How your Risk is Determined

To identify a community's flood risk, the Federal Emergency Management Agency (FEMA) conducts a Flood Insurance Study. The study includes statistical data for river flow, storm tides, hydrologic/hydraulic analyses and rainfall and topographic surveys. FEMA uses this data to create the flood hazard maps or Flood Insurance Rate Maps (FIRMs) that outline the community's different flood risk areas and show the locations of high-risk, moderate-to-low risk and undetermined-risk areas. Here are the definitions for each type:



The FIRM is the basis for floodplain management, flood hazard mitigation and insurance ratings

The FIRM is the official map on which FEMA has delineated both the 1% chance a year of flooding (the 100-year floodplain) and the National Flood Insurance Program (NFIP) risk premium, which help determine the cost of flood insurance. The lower the degree of risk, the lower the flood insurance premium.

LEGEND

SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A No Base Flood Elevations determined.

ZONE AE Base Flood Elevations determined.

ZONE AH Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.

ZONE AO Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.

ZONE AR Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.

ZONE A99 Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.

ZONE V Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.

ZONE VE Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

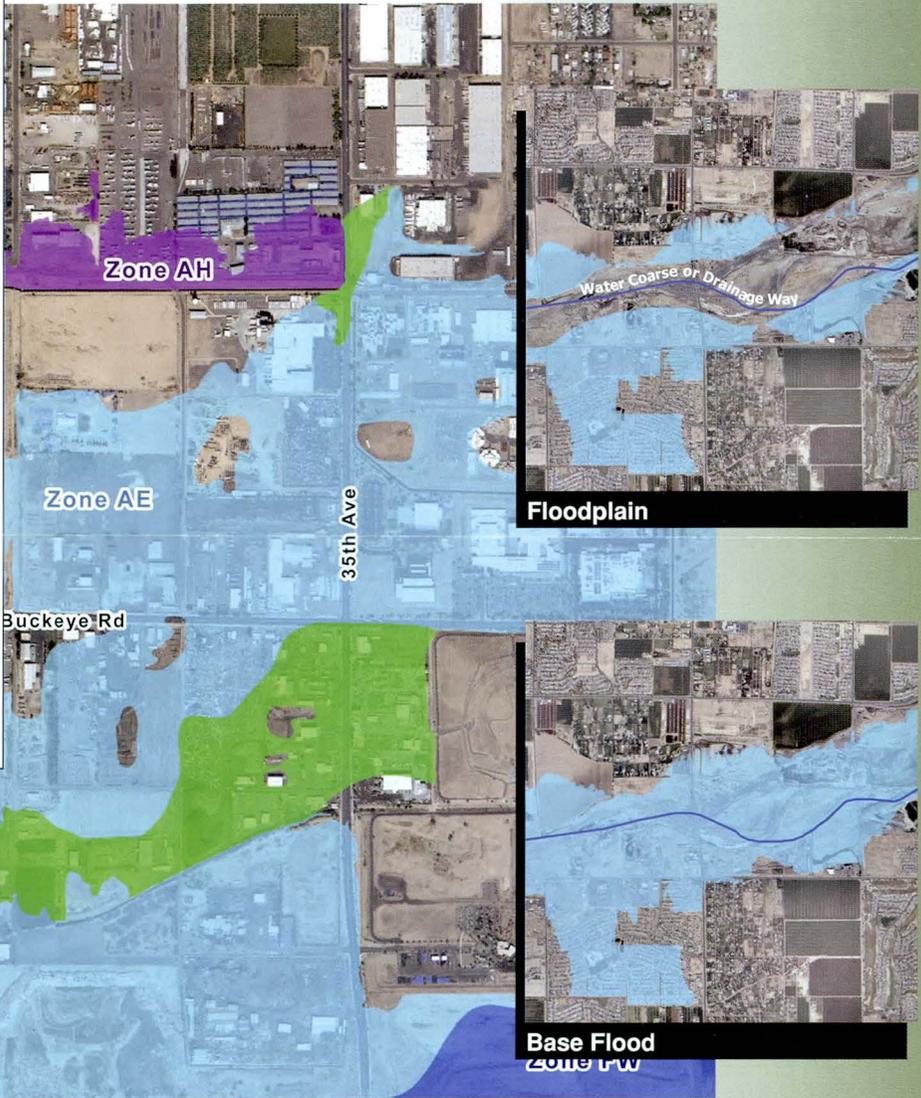
OTHER FLOOD AREAS

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.

OTHER AREAS

ZONE X Areas determined to be outside the 0.2% annual chance floodplain.

ZONE D Areas in which flood hazards are undetermined, but possible.



Magnitude of Flood Risk

Special Flood Hazard Areas (SFHA) & Zones

Use the floodplain map above to learn flood terms to help understand flood risk

- Floodplain - land area adjoining a water course or drainage way that is subject to inundation by a base flood.
- Base Flood - a flood that has a 1% annual chance to be equaled or exceeded in any year.
- Special Flood Hazard Area (SFHA) - land area that is designated by zones and covered by the base flood. This area is where the community's floodplain regulations are enforced and mandatory flood insurance is required.
- Zones - letter designations that indicate the different types of flood risk in specific areas.

Flood Insurance

In July of 2012 the Biggert-Waters Flood Insurance Reform Act (BW-12) was passed reauthorizing the NFIP and included increases in rates. However, when the new insurance rates were announced they were much higher. A new bill, Homeowner Flood Insurance Affordability Act (HFIAA), was approved on March 21, 2014.

The law repeals and modifies many of the BW-12 changes and replaces them with a more moderated program for increasing insurance premiums. For current information regarding HFIAA and flood insurance changes go to www.fema.gov/flood-insurance-reform. Additional information can be found on FEMA's FloodSmart website at www.floodsmart.gov.



Wickenburg, August 2014 Storm

This past August Maricopa County residents were inundated by monsoon rain around the valley. Large amounts of rain in a short period of time overwhelmed areas and caused flood damage to roads, residences and property. Storm runoff closed parts of Interstate 17, stranded motorists, residents and swept away livestock and pets.

Many of these areas were in moderate-to-low risk areas that do not require flood insurance. The 2013 Flood Control District survey found 70% of residents do not believe their own residence is in danger of flooding. However, as the storms this year have shown us, most people underestimate the damage a flood can cause and need to take protective action to lessen the financial consequences if not insured.

DID YOU KNOW - Floods are the #1 most common natural disaster in the United States.

- Everyone lives in a flood zone. 52% of residents in the Flood Control District's 2013 survey do not know if they live in the 100-year floodplain. For more information, go to www.fcd.maricopa.gov/GIS/maps.aspx.
- Most homeowners insurance does not cover flood damage. Make sure to get "content" coverage, which is a separate policy from flood insurance, to be financially protected. There is a 30-day wait period before a "flood insurance" policy becomes effective.

You are eligible to purchase flood insurance as long as your community participates in the National Flood Insurance Program. Maricopa County has been an NFIP partner since 1991. Federal disaster assistance is usually a loan that must be paid back with interest. For a \$50,000 loan at 4% interest, your monthly payment would be around \$240 a month (\$2,880 a year) for 30 years.



GET COVERAGE FOR AS LOW AS \$129 PER YEAR

Find out about our Preferred Risk Policy for homes in moderate-to-low risk areas.

[LEARN MORE](#)



WHAT COULD FLOODING COST ME?

This interactive tool shows the cost of a flood to your home, inch-by-inch.

[LEARN MORE](#)

- The FEMA website FloodSmart, www.floodsmart.gov, is an excellent source for information on locating an agent, flood risks, coverages and resources. You may also go our website at www.fcd.maricopa.gov for information and links to FEMA sites.

Anyone can be financially vulnerable to floods. In fact, people in the moderate-to-low flood areas file nearly 25% of all flood insurance claims and receive one-third of Federal Disaster Assistance for flooding (a loan that must be paid back). Flood insurance is available to homeowners, renters, condo owners/renters and commercial owners/renters. Costs vary depending on how much insurance is purchased, what it covers and the property's flood risk.



Substantial Improvement and Damage

These terms refer to existing structures. If an existing building is damaged by fire, flood, earthquake, wind, rain and/or natural or human-induced hazard the building must meet the requirements for new construction and must be brought up to current floodplain standards. Refer to the Floodplain Regulations for Maricopa County at www.fcd.maricopa.gov.

Substantial Improvement

It means the cost to rebuild/improve a structure in the floodplain, whether damaged or not, equals more than 50% OF MARKET VALUE PRIOR TO WORK START.

Substantial Damage

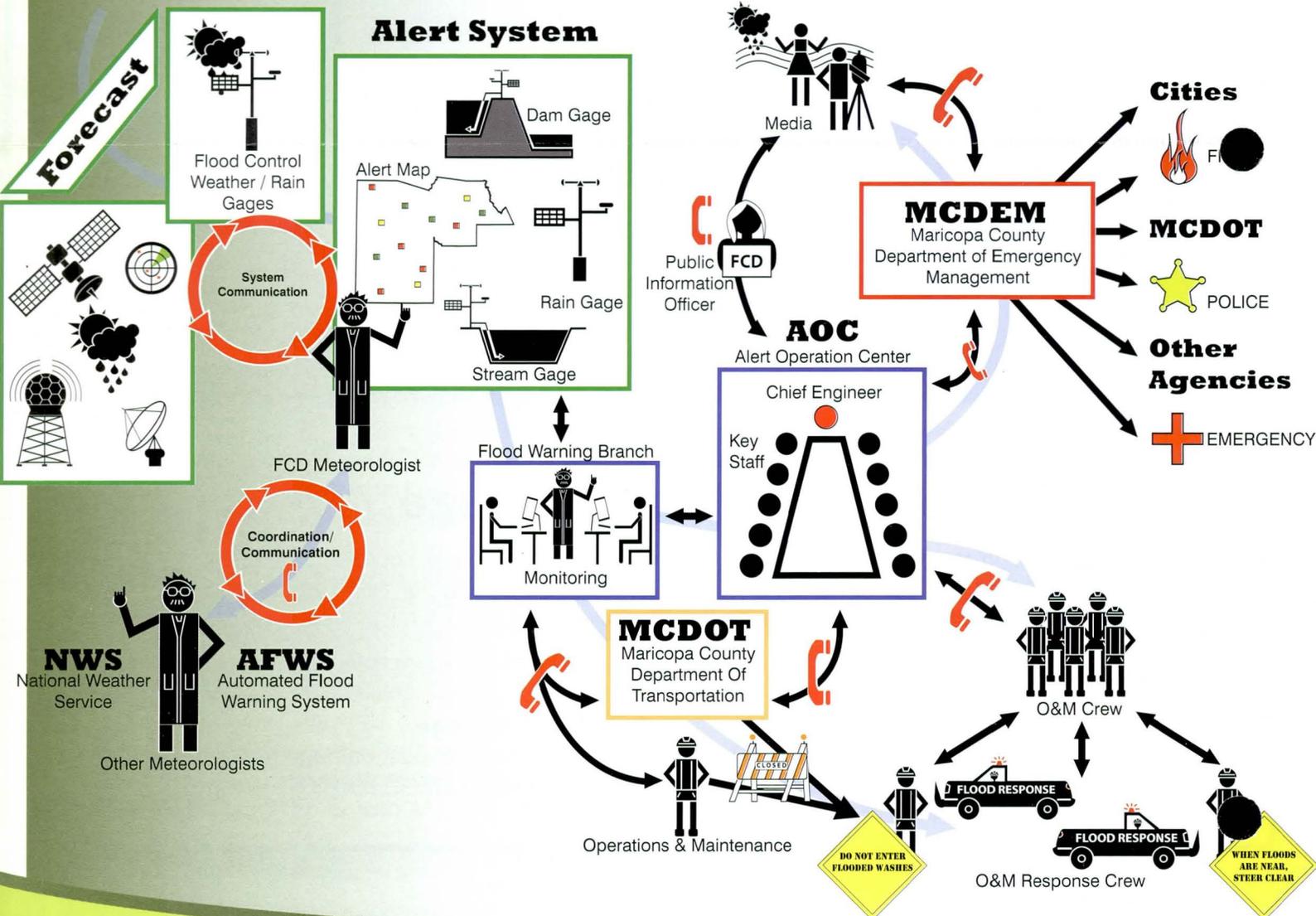
It means the cost of post-damage repair equals more than 50% PREDAMAGE MARKET VALUE.

District Flood Warning

The Flood Control District operates a 24-hour rain, stream and weather gage network which provides "real-time" information to the County and many other agencies about rainfall, floods and weather conditions in Maricopa County. This Automated Local Evaluation in Real Time system is represented as the acronym ALERT.

Heavy rainfall can generate stream flows which significantly impact Maricopa County and flood control structures such as dams, channels and levees. Different combinations of temperature, humidity, dew point, barometric pressure, solar radiation and wind speed/direction are measured by the gages and transmitted to the District every 15 or 30 minutes. Each gage is programmed with an alarm setting that notifies the District, other county departments, and the National Weather Service. Currently the District has 313 automatic rain gages, 175 automatic stream gages and 36 automatic weather stations throughout Maricopa and neighboring adjacent counties. For further information on rainfall, weather or ALERT system go to www.fcd.maricopa.gov/Rainfall/rainfall.aspx. A simplified communication process of the District's Flood Warning is shown below:

Start Here



Permitting and Building Responsibility

The Maricopa County Planning & Development Department is responsible for processing applications for land use approvals and permits, building permits and Floodplain Use Permits for unincorporated Maricopa County. If your property is in or near a floodplain, a Floodplain Use permit is required if you make changes to land within the 1% chance a year of flood hazard area. A Floodplain Use permit will have to be obtained before you build, grade or install any type of wall or fencing. The Planning & Development Department's One-Stop-Shop is located at 501 N. 44th Street, Suite 200, Phoenix, Arizona 85008; phone (602) 506-3301 or go to www.maricopa.gov/planning.

Cities and towns in incorporated Maricopa County process their own permits for development within the city/town limits. Depending on where your property is located, you will follow one of the three permitting scenarios below:

If your property is located in unincorporated Maricopa County, visit the Planning & Development Department's One-Stop-Shop (OSS): To start the permitting process. The OSS is a central location for the public. All OSS partner agencies that issue permits are routed a copy of the permit application for review, saving the applicant time by not having to visit each agency separately. The OSS partner agencies include: Building, Zoning, Drainage, MCDOT, Flood Control District and Environmental Services. Application packet information is found on the Planning & Development Department website at www.maricopa.gov/planning or call (602) 506-3301.

- 1. If your property is located in the following communities that handle their own floodplain management:** Avondale, Fountain Hills, Gilbert, Glendale, Goodyear, Paradise Valley, Peoria, Phoenix, Scottsdale and Tempe. The permit is processed by the respective community and a permit from the Flood Control District for development is not required.
- 2. If your property is located in the following communities in which the Flood Control District handles the floodplain management:** Buckeye, Carefree, Cave Creek, Chandler, El Mirage, Gila Bend, Guadalupe, Litchfield Park, Mesa, Queen Creek, Surprise, Tolleson, Wickenburg and Youngtown, visit the appropriate city or town location to start the permitting process. If your property is in or near a floodplain in these communities you will need to obtain a Floodplain Use Permit from the Flood Control District. The community will give you information for this process.

The Flood Control District directly issues Permits for the following development in a floodplain:

- 3. Right-of-Way permit:** Issued for the use of, or access through, property owned and maintained by the District.
- 4. Sand and Gravel or Other Materials permit:** Is issued when the operation can prove they will not obstruct the natural flow of the watercourse, will not cause damage to adjacent structures or properties and will preserve the natural and beneficial function of the watercourse.

Dams in Maricopa County

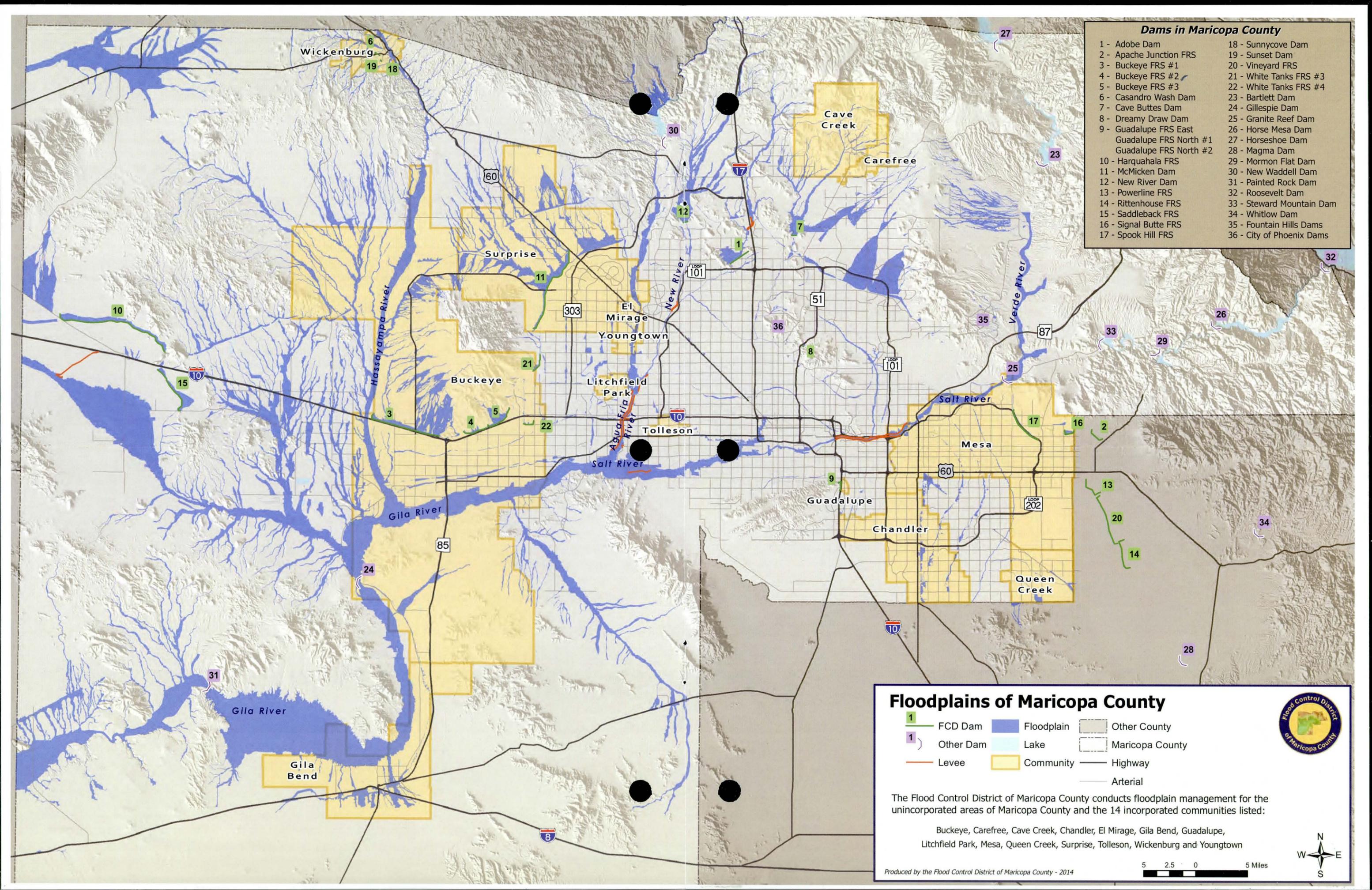
- | | |
|-------------------------|---------------------------|
| 1 - Adobe Dam | 18 - Sunnycove Dam |
| 2 - Apache Junction FRS | 19 - Sunset Dam |
| 3 - Buckeye FRS #1 | 20 - Vineyard FRS |
| 4 - Buckeye FRS #2 | 21 - White Tanks FRS #3 |
| 5 - Buckeye FRS #3 | 22 - White Tanks FRS #4 |
| 6 - Casandro Wash Dam | 23 - Bartlett Dam |
| 7 - Cave Buttes Dam | 24 - Gillespie Dam |
| 8 - Dreamy Draw Dam | 25 - Granite Reef Dam |
| 9 - Guadalupe FRS East | 26 - Horse Mesa Dam |
| Guadalupe FRS North #1 | 27 - Horseshoe Dam |
| Guadalupe FRS North #2 | 28 - Magma Dam |
| 10 - Harquahala FRS | 29 - Mormon Flat Dam |
| 11 - McMicken Dam | 30 - New Waddell Dam |
| 12 - New River Dam | 31 - Painted Rock Dam |
| 13 - Powerline FRS | 32 - Roosevelt Dam |
| 14 - Rittenhouse FRS | 33 - Steward Mountain Dam |
| 15 - Saddleback FRS | 34 - Whitlow Dam |
| 16 - Signal Butte FRS | 35 - Fountain Hills Dams |
| 17 - Spook Hill FRS | 36 - City of Phoenix Dams |

Floodplains of Maricopa County

- | | | |
|-----------|------------|-----------------|
| FCD Dam | Floodplain | Other County |
| Other Dam | Lake | Maricopa County |
| Levee | Community | Highway |
| | | Arterial |

The Flood Control District of Maricopa County conducts floodplain management for the unincorporated areas of Maricopa County and the 14 incorporated communities listed:

Buckeye, Carefree, Cave Creek, Chandler, El Mirage, Gila Bend, Guadalupe, Litchfield Park, Mesa, Queen Creek, Surprise, Tolleson, Wickenburg and Youngtown



Flood Safety

Protect your property and yourself from hazards

Both drainage and flood control are important in protecting your property and yourself from flooding hazards and risks. Maricopa County Drainage Regulations are administered by the Maricopa County Planning & Development Department. It is important that drainage systems are maintained. Dumping trash/debris in ditches, gutters, storm drains, local channels, private easements and washes is prohibited. For more information regarding the Maricopa County Drainage Regulations go to www.maricopa.gov/planning/Resources/Regulations or call the Planning and Development department at (602) 506-3301.

FLASH FLOOD WATCH

The National Weather Service will issue a flash flood watch when flash flooding is possible within a designated area.

FLASH FLOOD WARNING

The National Weather Service will issue a flash flood warning if flash flooding has been reported or is imminent. YOU MAY HAVE ONLY SECONDS.

The Floodplain Regulations for Maricopa County (adopted in 1976) define the rules for usage, development restrictions and permitting requirements necessary to protect the environmental and flood control qualities of floodplains.



July 2007 Storm

Driving Safety

- Do not walk through moving water. Six inches of moving water can make you fall and two feet or less will cause your vehicle to float.
- Do not attempt to drive through a flooded road. Be especially cautious at night when flood dangers are harder to recognize.
- Do not drive around barricades; they are there for your protection.
- Stick to designated evacuation routes.

Property Protection

- Avoid building in a floodplain unless you elevate and reinforce your home.
- Elevate the HVAC, water heater and electric panel if susceptible to flooding.
- Construct natural barriers/berms and grade correctly.
- Build with flood damage resistant materials.
- Clear obstructions such as debris from construction and conveyance systems (pipes, ditches, culverts, washes) that carry runoff on or near your property.



Before a Flood

- Purchase flood insurance (30 day wait period).
- Elevate your structures and utilities/meter.
- Build an emergency kit and make a family communication plan which include where to meet if separated.
- Remember your animals and their needs.
- Don't forget medicines and special needs required by family members.
- Sandbags are available at your local fire department.



New River, August 2014 Storm



Laveen, August 2014 Storm

During a Flood

- Listen to local officials and monitor your local radio or television for information.
- Be aware that flash flooding can occur. If it does, move immediately to higher ground.
- Be aware of streams, drainage channels, canyons, washes and other areas known to flood suddenly.
- Do not drive into flooded areas. Turn Around Don't Drown! Two feet of rushing water can carry away most vehicles.
- Be prepared to evacuate your home.



Phoenix, August 2014 Storm

After a Flood

- Avoid floodwaters; water may be contaminated by oil, gasoline or raw sewage. Water may also be electrically charged from underground or downed power lines.
- Be aware of areas where floodwaters have receded. Roads may have weakened.
- Return home only when authorities indicate it is safe.

Find more information on flooding, flood hazards, flood insurance and weather at the Federal Emergency Management Agency (FEMA) and National Weather Service (NOAA) websites:

www.fema.gov

www.floodsmart.gov

www.ready.gov/floods

www.nws.noaa.gov/floodsafety

Dams & Levees

The District operates and maintains 22 dams in Maricopa County solely for flood control purposes. These dams only hold water during flood events. Most dams that impact Maricopa County have been designed for the 1% chance a year flood event or greater. Emergency Action Plans (EAPs) have been developed for most dams that impact Maricopa County. While there are many variations in the individual plans, in general all the plans call for the public to be primarily notified through local media and by direct means like a reverse 911 system. These notifications will include specific information about safety measures and possible evacuation routes.

Additional information about dams can be found in the publication published by the Association of State Dam Safety Officials entitled "Living With Dams: Know Your Risks" which can be found at www.damsafety.org/media/Documents/DownloadableDocuments/LivingWithDams_ASDSO2012.pdf.



Adobe Dam, August 2014 Storm

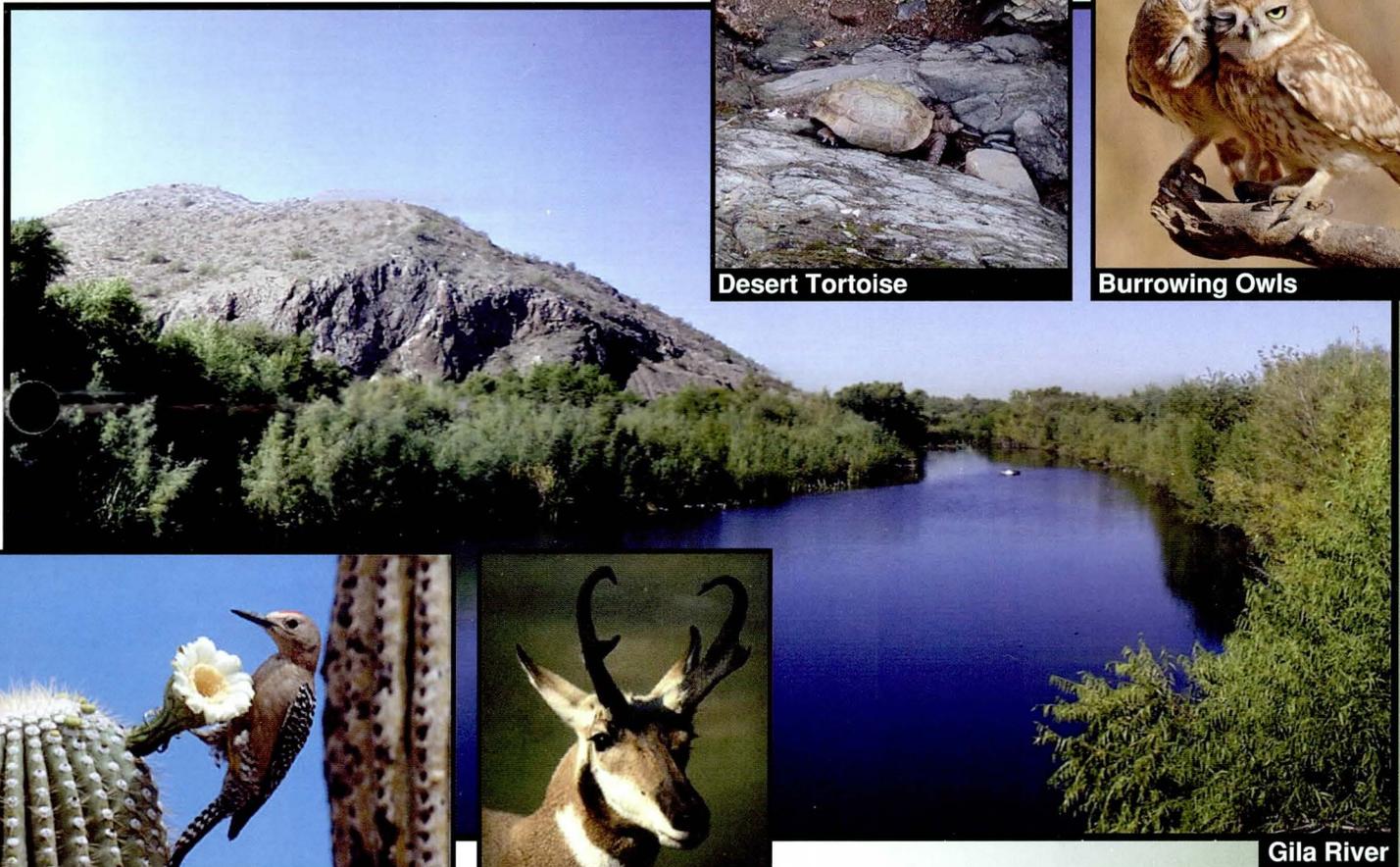
Most people are unaware that there are levees along some of the rivers and watercourses in Maricopa County. When properly built and maintained, levees can reduce flood risk but they don't eliminate it. For the last several years the District has been working with FEMA in order to have our levees continue to be accredited as providing protection during the 1% chance a year flood event. People who live or work behind levees should be aware of where levees are located and how to be prepared if flooding should occur. The United States Army Corps of Engineers (USACE) recommends that everyone in a leveed area have flood insurance.

During flood events you should pay attention to local radio and TV because, in the unlikely event there ever is a problem with a levee, notices will be provided to local media. Currently, the District has certified 8 of the 10 levees per our Provisionally Accredited Levee (PAL) agreements with FEMA and three (3) EAPs have been completed. The District is currently developing a Levee Safety Program that will include agency/community coordination, public notification and evacuation plans.

Several organizations cooperated in the development of a publication entitled "So You Live Behind a Levee". This publication has specific information on what to do if you live near a levee and is available from the American Society of Civil Engineers (ASCE) web site <http://content.asce.org/ASCELeveeGuide.html>. More information on dams and levees is available on the Flood Control District web site www.fcd.maricopa.gov.

Protect Natural Floodplain Functions

Maricopa County is situated within the northern reach of the Sonoran Desert, which is internationally recognized as one of the richest biotic eco-regions in the world. There are over 11,000 miles of rivers, streams, and washes that run through Maricopa County. In fact all major river systems in the lower 2/3 of the state converge and drain through Maricopa County. These rivers not only convey water but provide biological, social, and economic assets to our communities. Rivers are critical for flood conveyance capacity, erosion control, wildlife habitat, recreation potential and economic growth, quality of life and supporting of healthy, vibrant communities.



Desert Tortoise



Burrowing Owls



Melanerpes Uropygialis



Prohorn Deer

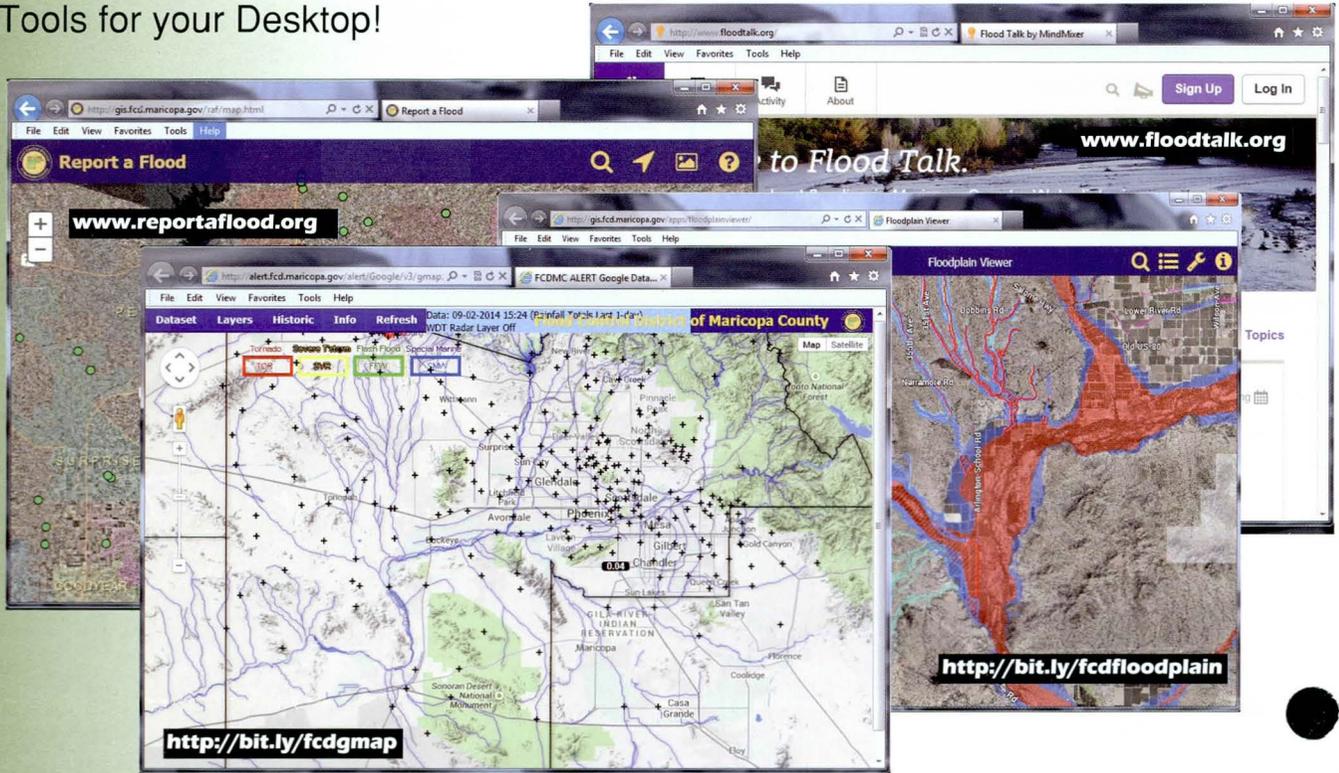
Gila River

Floodplain vegetation helps to stabilize the river banks, provide habitat for plants, animals and aquatic wildlife, control erosion and sedimentation and improve water quality by filtering pollutants. Healthy riparian corridors often provide the highest concentrations of plant and animal communities in a watershed providing a stable source of biodiversity. The habitat depends on the variation in water conditions for spawning, seed dispersal, elimination of competing vegetation and nursery areas for their young.

By transforming stream and river floodplains from problem areas into value-added assets, the community can improve its quality of life. Parks, bike paths, open spaces, wildlife conservation areas and aesthetic features are important to citizens. Assets like these make our community more appealing to potential employers, investors, residents, property owners and tourists.

Web Tools & Mobile Apps

Web Tools for your Desktop!



Mobile Apps!

Rainfall/
Streamflow
Data

View Areas
with
Warning Alerts

View Radar

Mobile Tools



<http://bit.ly/fcdgmap>



<http://bit.ly/fcdmt>



Kids Zone!

Meet and Color the Flood Control District of Maricopa County
FLOOD SAFETY
AMBASSADORS!



● *With*

Gage & Jet



Want a copy of the free activity book? Contact the District's Public Information office at (602) 506-1501.

Teachers! - We are available for classroom presentations and all participants receive a free Flood Control District Rain Gauge.



Flood Control District of Maricopa County

2801 West Durango Street, Phoenix, Arizona 85009
Phone: 602-506-1501, Fax: 602-506-4601
www.fcd.maricopa.gov

Interactive Locator Map



Click here to view an interactive map and zoom in on any area in the county to see structures, projects and studies.

- Map Instructions

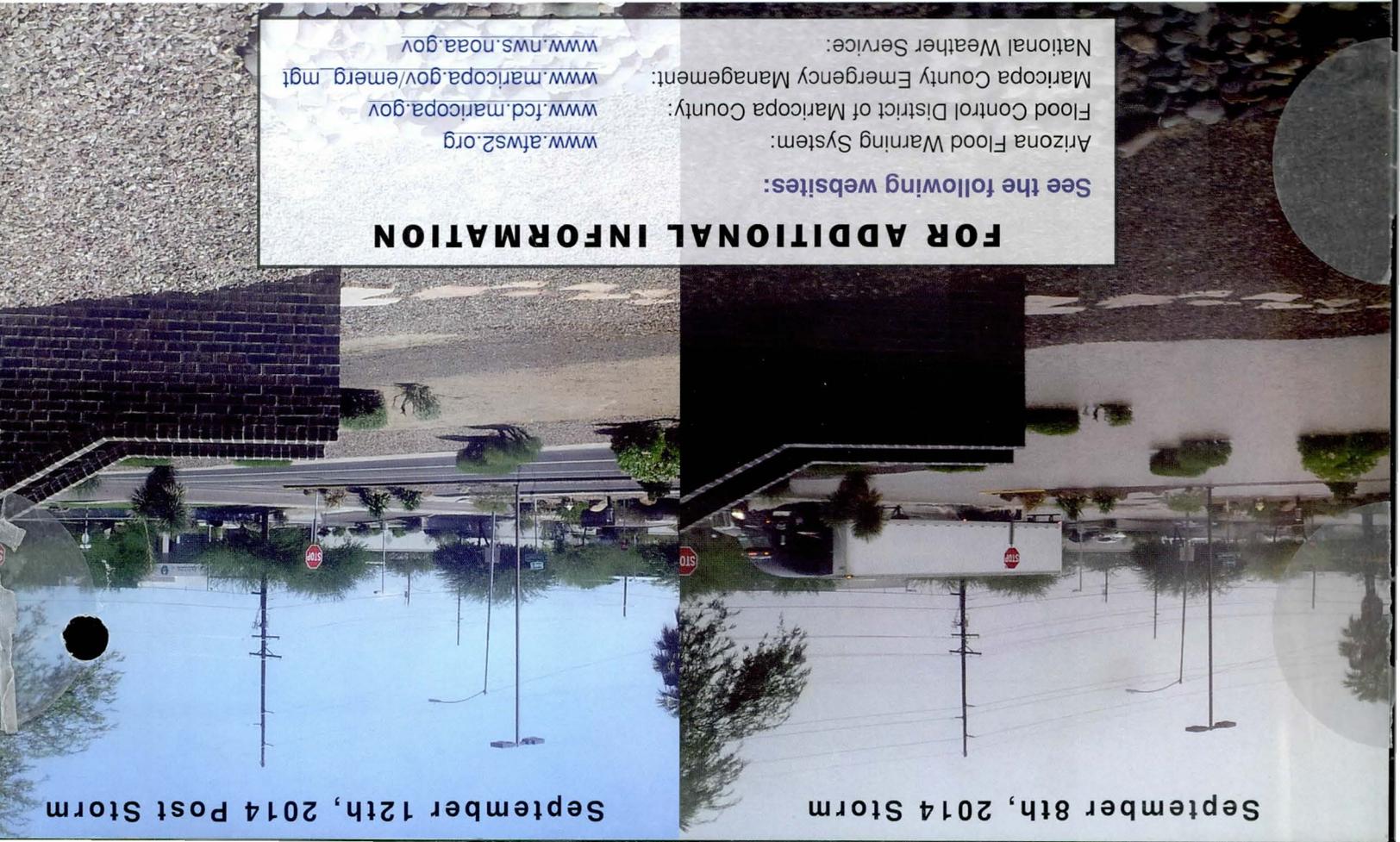
To access information on flood control projects, structures, and studies use the Flood Control District's "Interactive locator Map" by going to the "Projects & Structures" page on District website at:

www.fcd.maricopa.gov/Projects/PPM/projStruct.aspx

If this brochure was mailed to you, chances are your property is in a flood hazard zone and you are required to carry flood insurance. This brochure is designed to provide you with general information to get you started in your flood protection measures.



For Flood Watch/Warnings and Flash Flood Watch/Warnings tune into local stations (TV or radio) or the local NOAA Weather Radio in the Phoenix area - KEC 94 at 162.550



FOR ADDITIONAL INFORMATION

See the following websites:

- Arizona Flood Warning System: www.atfws2.org
- Flood Control District of Maricopa County: www.fcd.maricopa.gov
- Maricopa County Emergency Management: www.maricopa.gov/emerg_mgt
- National Weather Service: www.nws.noaa.gov

September 12th, 2014 Post Storm

September 8th, 2014 Storm