Earth Fissure Research Community

AZGS collaborates with other state and federal agencies and several advisory groups in mapping and studying earth fissures.

Arizona Department of Water Resources
www.azwater.gov/dwr/

Arizona State Land Department
www.land.state.az.us/

Arizona Attorney General's Office
www.azag.gov/

Arizona Division of Emergency Management
www.dem.state.az.us/

U.S. Geological Survey
http://arizona.usgs.gov/

County and Municipal Authorities

AZGS Earth Fissure Advisory Group

Arizona Geohazards Research Center
www.agrc.arizona.edu/index.htm

Arizona Land Subsidence Group
http://www.azlsg.org/

Association of Environmental & Engineering Geologists
www.aegweb.org/i4a/pages/Index.cfm?pageID=4261

Reporting Earth Fissures

All encounters with earth fissures should be reported to local authorities and to AZGS.

AZGS Earth Fissure Mapping Team

520-770-3500 [p]
520-770-3505 [f]

Fissures@azgs.az.gov

For more information...

Visit AZGS's Earth Fissure Center at **azgs.az.gov/EFC** for free PDF downloads of our Earth Fissure Planning Maps and priority study area maps, and other important earth fissure resources.

Arizona Geological Survey
Main Office
416 W. Congress, Suite 100
Tucson, AZ 85701
ph: 520.770.3500
fax: 520.770.3505

Arizona Geological Survey
Phoenix Branch
(C/O Department of Mines & Mineral Resources)
1502 W. Washington.
Phoenix, Arizona 85007
ph: 602.708.8253
fax: 602.771.1616

www.azgs.az.gov

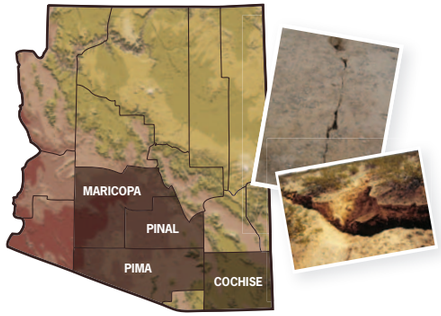
Earth Fissures

Find out more about earth fissures: what they are, how they form and how you can protect yourself

Earth Fissures in Arizona

Earth fissures are tension cracks that open as the result of subsidence due to severe overdrafts (i.e., pumping) of groundwater. As the ground slowly settles, cracks form at depth and propagate towards the surface, hundreds of feet above. Individual fissures range in length from hundreds of feet to several miles, and from less than an inch to several feet wide.

Rainstorms can erode fissure walls rapidly causing them to widen and lengthen suddenly, and dangerously, to form gullies 5- to 15- ft wide and tens of feet deep.



AZGS Earth Fissure Mapping.

In 2006, the Arizona Legislature charged the Arizona Geological Survey (AZGS) with mapping fissures throughout the State. AZGS efforts are concentrated in Cochise, Maricopa, Pima and Pinal Counties, where fissures are known to occur. In June 2007, AZGS published a series of 1:250,000 scale planning maps of known or reported earth fissures for the four counties.

AZGS identified 23 priority study areas throughout the four counties (see Earth Fissure Priority Mapping Areas). Upon completing mapping in an area, we hand the information off to the Arizona State Land Department, who makes the map data available to the public through their interactive mapping site.

Earth Fissure FAQ

What do I do once I know there is an earth fissure on my property?

Consult with a geotechnical company or consultant to review your options. Make sure that the company has qualified, registered geologists and engineers who have experience working with earth fissures. There are ways of managing earth fissures that allow residents and earth fissures to coexist.

Running water erodes and widens fissures rapidly. Do not add water to the area, and if possible divert runoff from the fissure.

Why are earth fissures in the news these days?

Geologists have been aware of earth fissure hazards since the early 1960s. Arizona's population is rapidly increasing and people are moving into former agricultural lands and encroaching upon earth fissures. As a result, more and more people are at risk from the hazards associated with earth fissures.

Why is AZGS mapping earth fissures?

Because the best way to manage earth fissures is to avoid building near them. This requires detailed mapping to identify fissure locations. Our maps provide the public with a first line of defense against these geohazards.

Do earth fissures change over time?

Earth fissures are dynamic – they constantly change in response to movement in the subsurface (continuing subsidence) and to activity at the surface (runoff from precipitation). Runoff can quickly widen and deepen existing earth fissures.

Should I build over an earth fissure?

It is not recommended to build on top of a known earth fissure; you should build as far from the fissure as possible. Fissures are easily destabilized and frequently occur in closely spaced sets. And remember, earth fissures are dynamic and capable of sudden change in length and width.

What is the recommended set-back for earth fissures?

Set-back policy, if it exists at all, is established by county and municipal governments, and thus varies from one locale to the next. The Arizona Geological Survey does not currently sanction any established set-back distance; we simply don't know enough about earth fissures yet to advise the public. We encourage prudence on the part of builders, realtors, and home owners in building near earth fissures.

Where can I learn more about where earth fissures exist?

Visit the AZGS Earth Fissure Center at www.azgs.az.gov/EFC for earth fissure planning maps and reports. And there you'll also find a link to the Arizona State Land Dept. 1:12,000 scale earth fissure map series.

Earth Fissures Priority Mapping Areas

For locations, see the AZGS Earth Fissure Planning Maps for Cochise, Maricopa, Pima and Pinal Counties online at **www.azgs.az.gov/EFC**.

1) Chandler Heights (Pinal & Maricopa)
2) Apache Junction (Pinal)
3) Luke (Maricopa)
4) Toltec Buttes (Pinal)
5) Picacho (Pinal)
6) Heaton (Pinal)
7) White Horse Pass (Pinal)
8) Signal Peak (Pinal)
9) Tator Hills (Pinal)
10) Greene Wash (Pinal)
11) Sacaton Butte (Pinal)
12) Scottsdale/NE Phoenix (Maricopa)
13) Pete's Corner (Pinal)
14) Santa Rosa Wash (Pinal)
15) Sulphur Springs North (Cochise)
16) Three Sisters Buttes (Cochise)
17) Bowie-San Simon (Cochise)
18) Dragoon Road (Cochise)
19) Wintersburg (Maricopa)
20) Marana (Pima)
21) Harquahala Plain (Maricopa)
22) Mesa (Maricopa)
23) Friendly Corners (Pinal)

Hazards Associated with Earth Fissures

Earth fissures and associated erosional gullies pose a hazard to people, property, and livestock. Some common and potential hazards include:

Cracked or collapsing roads;
Severed or deformed railroad tracks;
Broken pipes;
Damaged well casing or wellhead;
Broken canal liners;
Disrupted drainages;
Human injury;
Cracked foundation/separated walls;
Livestock/pet injury or death;
Contaminated groundwater aquifer;
Broken or disrupted utility lines.