DAVIS 2050
General Plan Update

Safety and Climate Change Existing Conditions Report

FINAL DRAFT

AUGUST 20, 2025

Davis
CALIFORNIA

CONTENTS

INTRODUCTION

The City of Davis is located in Yolo County, California, approximately 11 miles west of Sacramento. The city sits in the northern portion of the Central Valley in Northern California, approximately 52 feet above sea level. Like many cities in California, Davis is prone to natural hazards, including seismic activity, flooding, and geological hazards. The city is also susceptible to severe weather-related hazards, such as extreme heat, drought, and severe winds. Many of these hazards have impacted the community over the years, some more than others. Anticipating these hazards will impact the city in the future is expected; however, the frequency and intensity of future events may change due to changing conditions.

SUMMARY OF ISSUES AND OPPORTUNITIES

Davis has a full suite of natural hazard issues with which to contend. Over the years, the City has taken great steps to address these issues and continues to reduce its risk of impact from many of these hazards. As the City looks forward, the following areas should become a primary focus:

Seismic Hazards

Earthquakes are a significant hazard to the city. With older building stock and studies predicting an earthquake is due, the City should expect impacts to the economy and damage to buildings and infrastructure affecting residents and businesses. Future preparedness and mitigation efforts should focus on reducing seismic vulnerability through infrastructure improvements and structural retrofitting to minimize this risk.

Flooding

Davis is a relatively flat community adjacent to areas prone to flooding of various degrees. While much of the community doesn't experience significant flooding during rain events, much of the city's protection from flooding relies on levees and other infrastructure improvements that require maintenance and upkeep. Ensuring these facilities operate as designed and are monitored for changing conditions can help manage flood risk effectively.

Severe Weather (Climate Change/Adaptation)

Extreme heat is anticipated to be a major focus for the City in the foreseeable future. As temperatures continue to increase, the number of extreme heat days and heatwaves is expected to also increase. Infrastructure improvements may be necessary to accommodate these changing temperatures, especially since the city is projected to experience 10 times the number of extreme heat days by the end of the century. This increase should be accounted for in improving city-owned facilities dealing with energy efficiency and resilience.

The potential for an increase in droughts' frequency, length, and intensity creates the necessity for well-managed water production, transmission, and distribution. The City of Davis Public Works Utilities and Operations Department and the Woodland-Davis Clean Water Agency should focus coordination on water retention, storage, and maintenance strategies to effectively reduce drought vulnerability. Since groundwater and surface water resources can be impacted by drought, additional information regarding water resources for Davis are included in the Natural Resources and Conservation Existing Conditions Report.

Since winds are one of the most common hazards affecting Davis, risk reduction should focus on design and construction techniques that resist wind impacts better. In addition, understanding how healthy the trees are within the city and the types of impacts certain species of tree experience during wind (and drought) conditions can support greater resilience. Often, inadequate planting and maintenance practices may be to blame for unhealthy trees; however, as temperatures and precipitation conditions change, the City can expect some trees to experience additional stress, affecting their health.

Evacuation Routes

As communities throughout California experience more frequent and/or intense emergency incidents, there is a greater need to understand evacuation capabilities and constraints better. Knowing the evacuation routes through the community and areas where access may be constrained is critical to effective emergency management and is now required in the Safety Element. For Davis, a key strategy in addressing evacuation is to look at circulation and mobility issues comprehensively, identify improvements that can improve everyday community needs, and address evacuation constraints.

REGULATORY ENVIRONMENT

California Government Code Section 65302 (g) identifies the statutory requirements that govern the preparation of a General Plan Safety Element. This section of the Government Code has been modified several times to respond to the changing issues and priorities of the State since its original adoption..

Basic Element Requirements

Government Code Section 65302 (g) 1 requires the Safety Element to address the protection of the community from any unreasonable risks associated with the effects of the following hazards:

- Seismically induced surface rupture
- Ground shaking
- Ground failure
- Slope instability leading to mudslides and landslides
- Tsunami
- Seiche
- Dam Failure
- Flooding
- Subsidence
- Liquefaction
- Other geologic hazards
- Wildland and Urban Fires

In addition, Safety Elements are required to address these non-hazard-specific issues as they apply to the city:

- Peakload Water Supply Requirements
- Evacuation Routes
- Military Installations
- Minimum Road Widths and Clearances Around Structures

Recent Bill Changes

Changes by the California Legislature have recently been made and will require the following topics to be addressed in the Safety Element:

EVACUATION CONCERNS (AB 747, SB 99, AND AB 1409)

SB 99—California Government Code Section 65302 (g) 5—requires the identification of developments in any hazard area that do not have two evacuation routes.

AB 747 —California Government Code Section 65302.15— further requires that Safety Elements be reviewed and updated to identify the capacity, safety, and viability of evacuation routes under a range of emergency scenarios within the jurisdiction. While this requirement identifies the Safety Element, there is the potential that this analysis may overlap with the Circulation Element and will require coordination to reduce any potential conflicts.

AB 1409 - California Government Code Section 65302 (g)- Requires that local agencies review and update their general plan's safety element to identify evacuation locations and routes for identified fire and seismic hazards. This bill aims to improve preparedness by ensuring that local jurisdictions proactively plan for safe evacuation options during emergencies.

CLIMATE CHANGE CONCERNS (SB 379)

SB 379 —California Government Code Section 65302 (g) 4— requires that the Safety Element be reviewed and updated, as necessary, to address climate adaptation and resiliency. This review occurs in conjunction with preparing a vulnerability assessment or relying on a Local Hazard Mitigation Plan (LHMP), which addresses climate adaptation risks and vulnerabilities. Compliance with this requirement will rely on integrating the Greenhouse Gas Emissions and Climate Change Vulnerability Assessment, Sustainable Community Action

Plan, and an LHMP. Reliance on these documents ensures compliance and leveraging of these plans, effectively allowing for comprehensive implementation of future projects and programs that support addressing the effects of climate change.

WILDFIRE RISK IN STATE RESPONSIBILITY AREAS (SB 1241)

SB 1241 - California Government Code Section 65302 (g) - Requires cities and counties to address fire risk in state responsibility areas (SRA) and very high fire hazard severity zones in the safety element of their general plans upon the next revision of the housing element. This bill also requires cities and counties to make certain findings regarding available fire protection and suppression services before approving a tentative map or parcel map.

FLOOD RISK (AB 162)

AB 162 - California Government Code Section 65302 (g)- Requires cities and counties to update specified general plan elements to account for flood management and protection. Concerning the safety element, the requirements are upon the next housing element review on or after January 1, 2009, to identify flood hazard zones and establish policies to avoid or minimize unreasonable flooding risks.

EXTREME HEAT (AB 2684)

AB 2684 - California Government Code Section 65302 (g) -Requires that cities and counties review and update their general plan safety elements to address extreme heat hazards. This update is required upon the next revision of the general plan or its safety element, starting on or after January 1, 2028. The bill also addresses the need for cities and counties to identify new information about extreme heat hazards applicable to their area. It authorizes a city or county that has adopted an extreme heat action plan or other document that fulfills commensurate goals and objectives to use that information in the safety element, as specified, and, upon doing so, would require the city or county to summarize and incorporate into the safety element the other plan or document.

PLAN INTEGRATION (AB 2140)

AB 2140 —California Government Code Section 65302.6— recommends the integration of the LHMP into the General Plan Safety Element. Upon completing this voluntary requirement, the City would be eligible for potential cost savings during future disaster/emergency events where the California Disaster Assistance Act requirements are activated. Preparation of the LHMP and General Plan Safety Element anticipates compliance with this requirement.

State Regulations

ALQUIST-PRIOLO EARTHQUAKE FAULT ZONING ACT

The intention of the Alquist-Priolo Earthquake Fault Zoning Act (1972)—California Public Resources Code (PRC), Chapter 7.5, Section 2621-2699.6—is to reduce the risks associated with surface faults. The designated State Geologist must identify and map "Earthquake Fault Zones" around known active faults. Per PRC Section 2623, before the approval of a project, cities and counties shall require a geologic report defining and delineating any hazard of surface fault rupture. If a city or county finds that no undue hazard of that kind exists, the State Geologist may waive the report. For a list of project types, please refer to PRC Section 2621.6.

SEISMIC HAZARDS MAPPING ACT

The Seismic Hazards Mapping Act —California Public Resources Code, Chapter 7.8, Section 2690-2699.6— created a statewide seismic hazard mapping and technical advisory program in 1990 to help cities and counties address the effects of geologic and seismic hazards caused by earthquakes. Per PRC 2697, cities and counties shall require, before the approval of a project located in a seismic hazard zone, a geotechnical report defining and delineating any seismic hazard. If a city or county finds that no undue risk of this kind exists, based on information resulting from studies conducted on sites near the project and of similar soil composition to the project site, the geotechnical report may be waived. After report approval or a waiver is granted, subsequent geotechnical reports shall not be required, provided that new geologic data warranting further investigation is not recorded. Each city and county shall submit one copy of each approved geotechnical report, including the mitigation measures, if any, and deliver it to the state geologist within 30 days of report approval. For a list of project types, please refer to PRC Section 2693.

Federal Regulations

DISASTER MANAGEMENT ACT OF 2000

The federal Robert T. Stafford Disaster Relief and Emergency Act, amended by the Disaster Management Act of 2000 (DMA 2000), creates a federal framework for local hazard mitigation planning. It states that jurisdictions that wish to be eligible for federal hazard mitigation grant funding must prepare a hazard mitigation plan that meets a specific set of guidelines and submit it to the Federal Emergency Management Agency (FEMA) for review and approval. These guidelines are outlined in the Code of Federal Regulations, Title 44, Part 201, and discussed in greater detail in FEMA's Local Mitigation Plan Review Tool. To remain eligible for FEMA funding opportunities, these plans must be updated and approved by FEMA every five years.

The Yolo County Operational Area Hazard Mitigation Plan complies with DMA 2000 by identifying and assessing risks from natural hazards like flooding, wildfires, drought, and severe weather and outlining strategies to reduce their impact. This multi-jurisdictional effort involved Yolo County and many cities, special districts and a tribal nation (Yocha Dehe Wintun Nation).

NATIONAL FLOOD INSURANCE PROGRAM

The National Flood Insurance Program (NFIP) is a federal program designed to reduce the impact of flooding on private and public structures. It provides flood insurance to property owners, renters, and businesses in participating communities. The NFIP also encourages communities to adopt and enforce floodplain management regulations, aiming to reduce future flood damage. It's administered by the Federal Emergency Management Agency (FEMA).

HAZARDS OF CONCERN

The Safety Element is the primary location for the City to address natural hazard issues within and/or near the community. Many communities will often use this plan in conjunction with their Local Hazard Mitigation Plan, which is a voluntary document approved by the Federal Emergency Management Agency (FEMA). Based on the requirements of the California Government Code (65302 g), the following hazards are of greatest concern:

- Seismic Hazards
- Flooding
- Wildfire
- Geologic Hazards
- Severe Weather

Seismic Hazards

The City of Davis is located in a seismically active region. Located in close proximity to potentially active faults of various lengths and significance, Davis is prone to the effects of seismic hazards (earthquakes). Seismic hazards can be categorized as primary and secondary hazards.

Primary seismic hazards typically include seismic shaking and surface fault rupture, as they generally occur as a direct result of an earthquake. Secondary seismic hazards typically include liquefaction, tsunami, seiche, and earthquake-induced landslides, as these types of events are triggered by an earthquake. Other effects associated with earthquakes include harm to people (injury/ loss of life), harm to buildings, damage to roads and infrastructure, disruption of essential services (power loss, communication outages), and economic losses. The severity of these effects is based upon the proximity of the earthquake, how deep or shallow the earthquake occurs, the soil composition (how loose or tightly packed), and how strong the ground shakes because of the event.

Primary Seismic Hazards

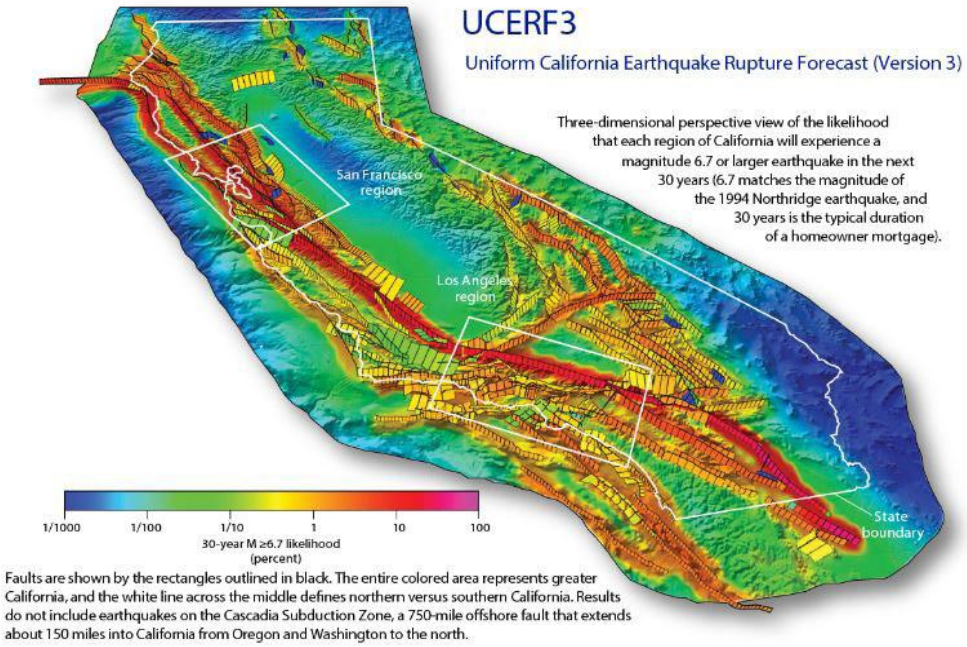
Primary seismic hazards are the direct result of an earthquake. These hazards usually occur in the form of moderate to strong seismic shaking and surface rupture directly resulting from the seismic event. While not located near any major faults mapped as having a high risk of surface rupture, Davis is located in close proximity to some major regional fault systems, including the San Andreas fault system (located along the western margin of the San Francisco Bay) and the Eastern Sierra fault system (located along the eastern slopes of the Sierra Nevada Mountains). The only active earthquake fault system nearby is the Hunting Creek fault, which is located in the northwestern area of Yolo County. For this reason, seismic shaking is the only primary hazard discussed in this section.

SEISMIC SHAKING

Seismic shaking (ground shaking) is the term that refers to the movement of the Earth's surface resulting from an earthquake. This shaking is typically the primary cause of earthquake damage, which generally correlates to the earthquake's magnitude and proximity to the event's epicenter. Typically, the Modified Mercalli Intensity (MMI) scale measures the intensity of seismic shaking based on the amount of observed damage. The MMI scale replaced the Richter Scale, which loses its effectiveness when measuring stronger earthquakes. Since the degree of shaking and damage generally decreases as the seismic energy travels further away from the earthquake's point of origin, different locations within a city or region can report different MMI measurements. The MMI scale (Table 1) is organized into 12 levels of measurement based on shaking intensity and the effects observed.

No active faults run through the City of Davis. As previously mentioned, Davis is located in between major regional fault systems. The closest faults to the city are the Great Valley faults (Mysterious Ridge, Trout Creek, and Gordon Valley subsections) and the Hunting Creek fault, which is a subset of the Berryessa Fault system. Hunting Creek is considered an active fault and can potentially generate earthquakes; however, the probability of producing a significant event is not high. According to the UCERF3[1], displayed in **Figure** 1, the Hunting Creek Fault, which is approximately 27 miles west of the city has a 6.65% chance of producing an M6.7 earthquake and a 1.79% chance of producing an M7.5 earthquake in the next 30 years.

Figure 1. Uniform California Earthquake Rupture Forecast (Version 3)



[1] Edward H. Field, Thomas H. Jordan, Morgan T. Page, Kevin R. Milner, Bruce E. Shaw, Timothy E. Dawson, Glenn P. Biasi, Tom Parsons, Jeanne L. Hardebeck, Andrew J. Michael, Ray J. Weldon, Peter M. Powers, Kaj M. Johnson, Yuehua Zeng, Karen R. Felzer, Nicholas van der Elst, Christopher Madden, Ramon Arrowsmith, Maximilian J. Werner, Wayne R. Thatcher; A Synoptic View of the Third Uniform California Earthquake Rupture Forecast (UCERF3). Seismological Research Letters 2017; 88 (5): 1259–1267. doi: https://doi.org/10.1785/0220170

In comparison, the San Andreas Fault is located approximately 70 miles west of the city and is considered one of California's most active faults. This fault segment has a 6.03% chance of generating an earthquake of M7.5 or greater within the next 30 years. Seismic shaking associated with an earthquake has the most significant potential to result in loss of life, property, and economic damage within the city.

Table 1. Modified Mercalli Intensity Scale

Intensity	Description	Effects Observed
I	Instrumental	Felt only by a few people under especially favorable conditions.
II	Feeble	Felt only by a few people at rest, especially on the upper floors of buildings.
III	Slight	Noticeable by people indoors, especially on upper floors, but not always recognized as an earthquake.
IV	Moderate	Felt by many indoors and by some outdoors. Sleeping people may be awakened. Dishes, windows, and doors are disturbed.
V	Slightly strong	Felt by nearly everyone, and many sleeping people are awakened. Some dishes and windows broken, and unstable objects overturned.
VI	Strong	Felt by everyone. Some heavy furniture is moved, and there is slight damage.
VII	Very strong	Negligible damage in well-built buildings, slight to moderate damage in ordinary buildings, and considerable damage in poorly built structures.
VIII	Destructive	Slight damage in well-built buildings, considerable damage and partial collapse in ordinary buildings, and great damage in poorly built structures.
IX	Ruinous	Considerable damage in specially designed structures. Significant damage and partial collapse in substantial buildings, and buildings are shifted off foundations.
X	Disastrous	Most foundations and buildings with masonry or frames and some well-built wood structures are destroyed. Rail lines are bent.
XI	Very disastrous	Most or all masonry structures, including bridges, are destroyed. Rail lines are substantially bent.
XII	Catastrophic	The damage is total. The lines of sight are distorted, and objects are thrown into the air.

Figure 2 identifies the ground shaking potential for the planning area. Ground shaking potential is measured in relationship to the force of Earth's gravity (g) or percent g. Percent g is computed by determining the acceleration of the earthquake's motion relative to the force of gravity, which is 1.0g. Based on this, parts of the City are expected to experience shaking intensity up to .75g or 75% of the acceleration of Earth's gravity. Factors that impact the intensity of shaking include the types of earth materials (soil, rock, etc.), degree of consolidation (loose, compact, etc.), and proximity to the source of the earthquake. Areas in the western portion of the city (closest to active faults within the region) will likely experience more intense shaking in the event of an earthquake.

Secondary Seismic Hazards

Secondary seismic hazards include those that involve the interaction/reaction of earth materials to a seismic event. In 1990, the Seismic Hazards Mapping Act went into effect, which identifies and maps potential hazard conditions, typically including liquefaction and earthquake-induced landslides. While many parts of the state have been mapped under this program, the City of Davis has not been included in this mapping effort to date.

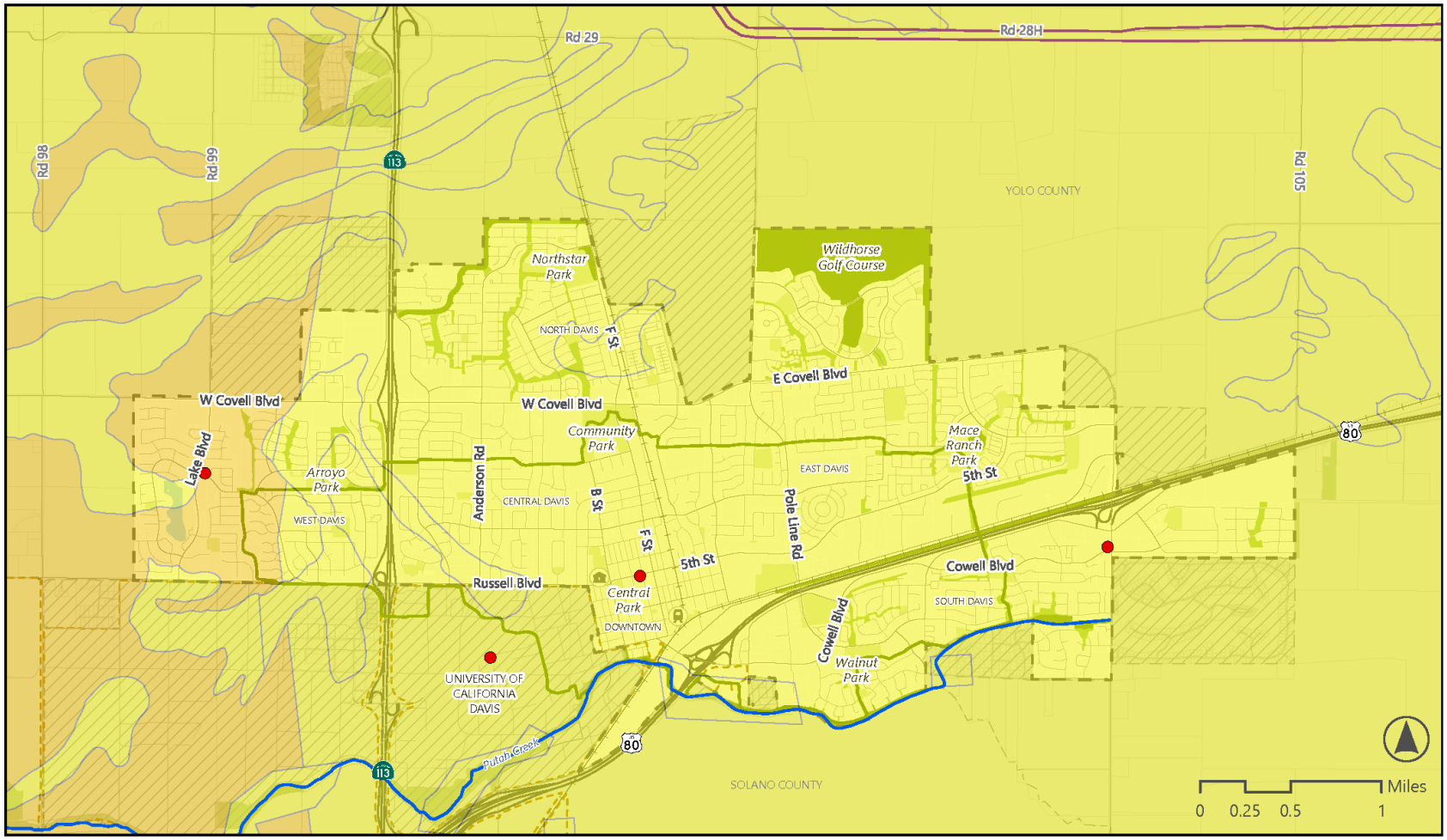
LIQUEFACTION

Liquefaction is a ground failure phenomenon that occurs as a result of a seismic event. Liquefaction, which can occur when strong seismic shaking occurs during an earthquake, is mostly found in areas with sandy soil or fill and a high-water table located 50 feet or less below the ground surface. Liquefaction can cause damage to structures when the ground they sit atop liquefy, causing sinking or other major structural damage.

Ground failure typically occurs when all three conditions are present, 1.)loose unconsolidated granular soils, 2.) shallow groundwater conditions, and 3.) strong seismic shaking. When these conditions occur, soils experience a total or substantial loss of shear strength and behave like a liquid.

According to the California Department of Conservation (CDOC) mapping, the City faces some risk of liquefaction during earthquakes, primarily in areas containing sandy, water-saturated soils. While the city's overall risk is lower than other parts of the state, it's still wise to consider the potential for liquefaction when planning construction or development in specific locations. The City is located in a seismically active region, increasing the likelihood of earthquakes that could trigger liquefaction. According to the Yolo Subbasin Groundwater Agency (YSGA), groundwater elevations in many parts of the community can be shallower than 50 feet beneath the ground surface at certain times of the year. **Figure 3** identifies the groundwater wells within and around Davis that are used by YSGA to monitor groundwater conditions. Groundwater elevations throughout the City are generally fluctuating around 50 feet beneath the ground surface (bgs).

Figure 2. Seismic Shaking Potential



City of Davis
Sphere of Influence
UC Davis Campus
County Boundary

Publicly Accessible Open Space
Greenbelts
Parks
Publicly Accessible Open Space Outside the City Limits
Lakes

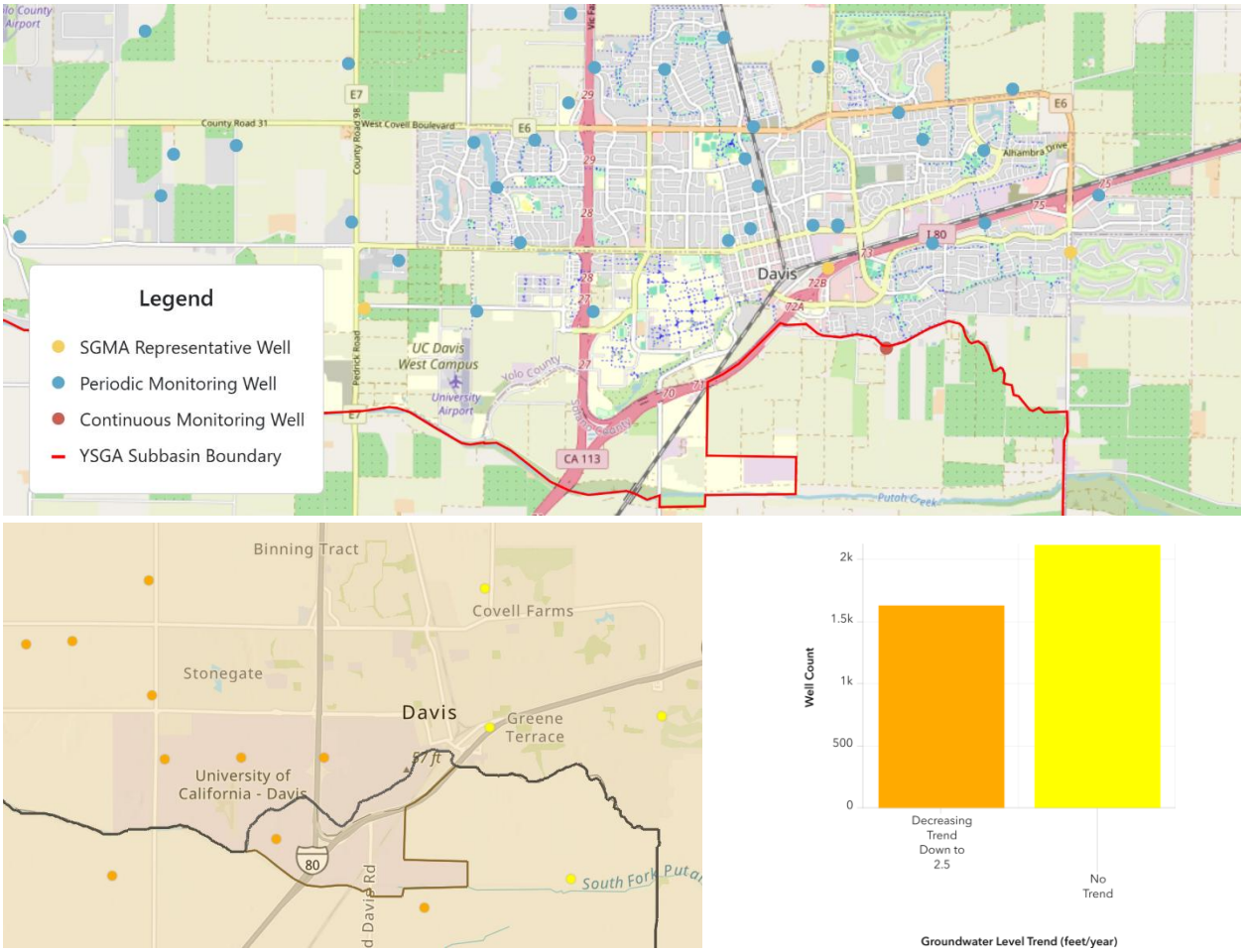
Amtrak Station
City Hall
Highways
Major Roads
Local Roads
Rail Lines
Bike Loop
Rivers/Creeks
Levees

Fire Stations

Seismic Shaking (g)
0.250000 - 0.550000
0.550001 - 0.750000
0.750001 - 0.950000
0.950001 - 1.250000
1.250001 - 1.550000
1.550001 - 2.150000

Source: City of Davis (2025), UC Davis (2025), Yolo County (2025), CalTrans (2025), California Department of Fish and Wildlife (2025).

Figure 3. YSGA Groundwater Monitoring Wells



Areas along rivers and streams typically have loose sediments and soils that are often saturated, making them prone to liquefaction during an earthquake. Older floodplains and deltas, as these areas are composed of previously deposited sediments, can be susceptible. Specifically, areas south of I-80 and along the west levee of the Yolo Bypass are within the floodplain and have a higher potential for liquefaction because of the saturated soils and proximity to the Yolo Bypass.[2] Construction in areas prone to liquefaction requires special foundation designs and/or soil stabilization techniques to reduce the potential risk from this hazard.

Additional information regarding water resources for the City can also be found in the Environment Resources and Conservation Existing Conditions Report.

[2] "Location and Topography | City of Davis, CA." City of Davis. Accessed June 10, 2025. https://www.cityofdavis.org/about-davis/location-and-topography.

Earthquake Induced Landslides

Ground failure resulting from an earthquake can also occur as an earthquake-induced landslide. These failures typically happen in areas with steep slopes or unstable soil conditions. Usually, post-wildfire conditions and intense precipitation can exacerbate these unstable conditions, contributing to greater landslide vulnerability. Landslides can impact structures, sever utility lines, block roadways, and impact people and properties in the path of the failure. Due to a lack of mapping by the California Geological Survey, no areas of Davis have been identified as prone to earthquake-induced landslides. For an area to be officially designated as susceptible to earthquake-induced landslides, it must be included in these mapped "Zones of Required Investigation." Davis, located on flat terrain with very gentle slopes and underlain primarily by alluvial soils, has not been mapped by the CGS as containing earthquake-induced landslide hazard zones. CGS mapping focuses on areas with significant relief or prior landslide activity; neither condition applies to Davis.

Geologic Hazards

Slope Stability/ Erosion

Slope stability is dependent on many factors and their interrelationships. Some of the most important factors include the height and steepness of slopes and the strength and orientation of the geologic units, which play a key role in slope stability. Ultimately, conditions like prolonged rainfall, stream erosion, and slope alterations create favorable conditions for failure. Erosion is the process where soil and rock are moved from one place to another, typically by natural forces like wind, water, or ice. It essentially breaks down and transports earth materials and plays a significant role in shaping landscapes over time.[3]

Davis generally experiences minimal slope stability and erosion issues due to its relatively flat topography. The city is located in the eastern portion of the Putah Creek Plain, where slopes are generally less than one percent. While there might be localized areas with steeper slopes or along drainage channels where erosion could occur, the overall risk is low. Due to the gentle slopes, the potential for soil erosion and slope instability is less pronounced compared to areas with steeper terrain. While the city likely doesn't have widespread slope stability

[3] California, State of. “Erosion Control Design.” Erosion Control Design | Caltrans. Accessed June 10, 2025. https://dot.ca.gov/programs/design/lap-erosion-control-design. Caltrans, “Erosion Control techniques” https://dot.ca.gov/programs/design/lap-erosion-control-design

issues, Caltrans, for example, recommends vegetation establishment, erosion mats, and other stabilization methods for slopes in general.[4]

Erosion in the city primarily occurs due to natural factors like water and wind, as well as human activities like construction and farming. Areas with moderate erosion risk include regions south of Interstate 80 within the Yolo Bypass, particularly along the levee. Specifically, areas near the Colusa Basin Drain, Cache Creek, and the Sacramento River, including the Yolo Bypass, are also susceptible to flood hazards and potential erosion. Additionally, areas with erodible soils, steep slopes, or drainage ways are depicted in **Figure 4**. As depicted in Figure 4, small areas of Davis mapped in orange and red are considered susceptible to landslide. These areas are mainly located along drainages, where erosion may be common. The majority of the City is relatively flat and not considered susceptible to landslide or erosion.

The City of Davis has a program to manage erosion and sediment control during construction projects, ensuring proper practices are followed to maintain slope stability and prevent erosion. Additionally, UC Davis utilizes various methods, including straw mulching and cover cropping, to minimize erosion on campus.[5]

Subsidence

In addition to slope stability, ground subsidence is another geologic hazard that involves the gradual settlement or sinking of the ground. This hazard typically involves vertical ground movement typically from the extraction of groundwater, oil, or gas; or the decomposition of organic materials like peat. The breakdown of these materials results in a loss of volume within soils that can result in vertical movement. The likely source for subsidence within the city would be the result of groundwater extraction.

The city and surrounding areas in Yolo County are known to have experienced land subsidence in the past. Subsidence in the Sacramento Valley, where Davis is located, is primarily attributed to groundwater extraction for irrigation and other uses. The California Department of Water Resources noted that Yolo County has one of the largest geographical areas affected by subsidence. The reported statewide accuracy of the data is 18 mm, or 0.059 feet. The dataset shows several pockets in the Yolo Subbasin where there are indications of subsidence and changes in the subbasin's surface elevation. Since July 2022, subsidence has largely stabilized due to subsequent above normal water years allowing for natural recharge and reduced groundwater use. The central portion of the subbasin showed

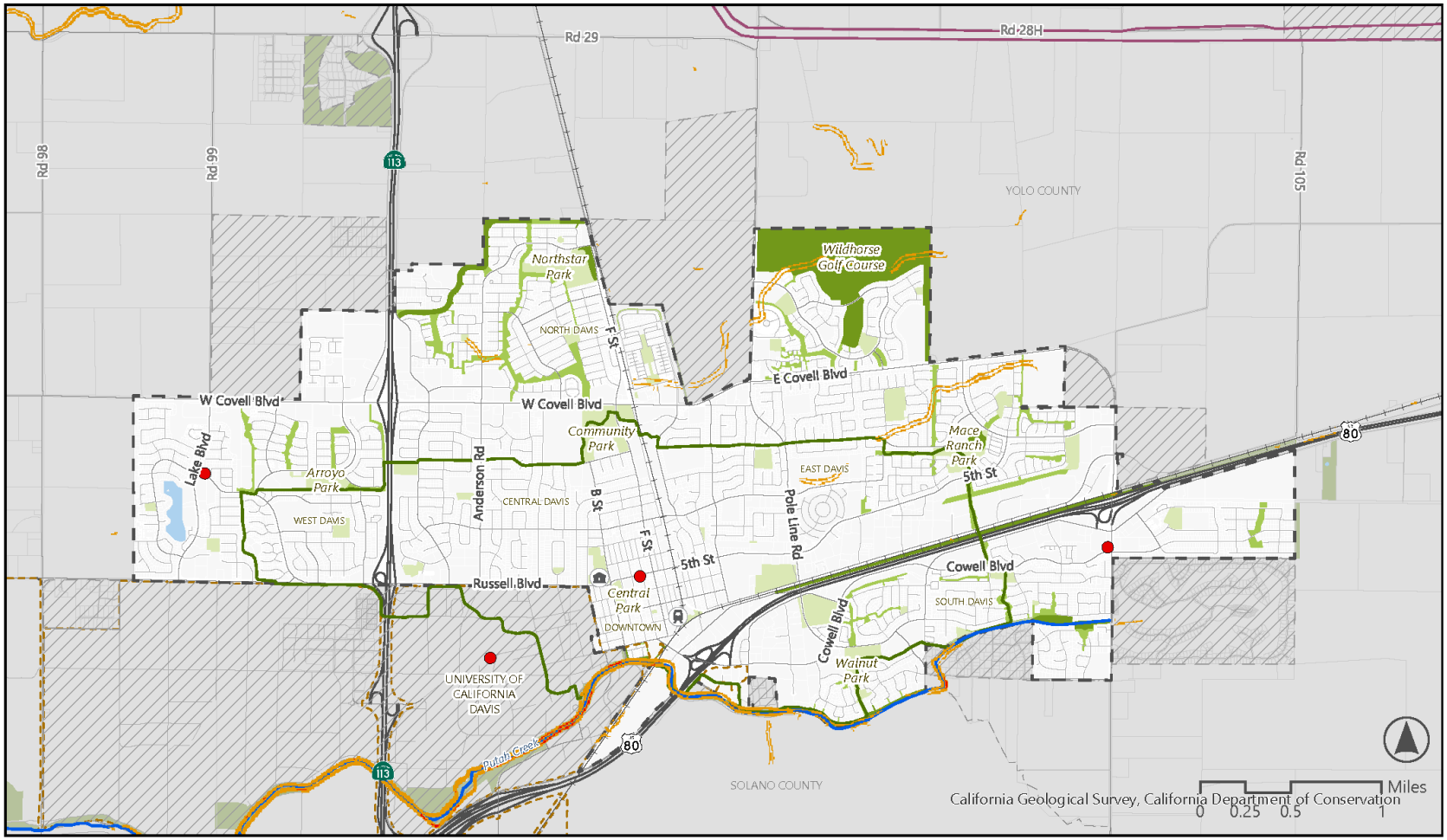
[4] "Landscape Management & Weeds | City of Davis, CA." City of Davis. Accessed June 10, 2025. https://www.cityofdavis.org/city-hall/public-works-utilities-and-operations/integrated-pest-management/landscape-management-weeds.

[5] Anonymous. "Hay Is for...Erosion Control!" UC Davis Arboretum and Public Garden, September 21, 2018. https://arboretum.ucdavis.edu/blog/hay-forerosion-control#:~:text=Spreading%20straw%20mulch%2C%20moistening%20it,Davis%20Arboretum%20and%20Public%20Garden.

recovery (upward land movement) of approximately 0.1 feet in 2023. In Water Year 2024, no vertical displacement was detected.

Coordination between the City of Davis Public Works Utilities and Operations Department and the YSGA is recommended to continue monitoring groundwater levels/elevations and track any subsidence concerns related to water production, transmission, and distribution.

Figure 4. Landslide Susceptibility Zones



Source: City of Davis (2025), UC Davis (2025), Yolo County (2025), CalTrans (2025), California Department of Fish and Wildlife (2025).

Flooding and Levee/Dam Failure

Flooding

The city, despite being in Yolo County, which is naturally prone to flooding, is at low risk for storm-related flooding and is protected by Monticello Dam on Putah Creek. The city has a low risk of flood, particularly for storm-related flooding, but it's important to remember that flooding can occur anywhere it rains. Flood risk is based on a number of factors including rainfall, topography, flood-control measures, river flow and tidal surge data, and changes due to new construction and development.

Only a small portion of the city (less than 5%) falls within the 100-year floodplain (Zone A/AE), and even fewer areas are subject to deep or persistent flooding. Some of these areas are identified as Special Flood Hazard Area's (SFHA) designated by the Federal Emergency Management Agency (FEMA). These areas are defined as having a 1% chance of flooding in any given year. The area's south of I-80 that are considered SFHAs, tend to be located near the west levee along the Yolo Bypass. Due to the presence of these FEMA identified flood areas, the city participates in the National Flood Insurance Program (NFIP) and does have Flood Insurance Rate Maps (FIRMs). Homes located in those zones are required to have flood insurance. While the City is located in a relatively flat area with no major rivers running through it, the lack of topography may still experience flooding. **Figure 5** displays the 100-year FEMA flood zone. **Figure 6** identifies the 500-year FEMA flood zones, as well as the 200-year flood zones identified by the California Department of Water Resources.

- Flooding hazards have the potential to impact a significant amount of the community; however, less than 5% of this area is subject to a 100-year event.
- Development within flood hazard areas are expected to comply with flood protection standards that reduce vulnerability to flood impacts and ensure safe use and occupation of structures.
- New development proposed in areas north of the city, which are located in the 100-year floodplain will have to account for these conditions and address flooding concerns as part of the development process.

Levee/Dam Failure

The Yolo County Operational Area Hazard Mitigation Plan identifies levee failure as the number one overall hazard risk score for the county (out of 14 identified hazards) and has the potential to cause extensive damage countywide. Dam failure, while having the same countywide damage potential, is ranked as the 7th highest overall hazard risk score, as there is a lower likelihood of failure in comparison to the levee systems.

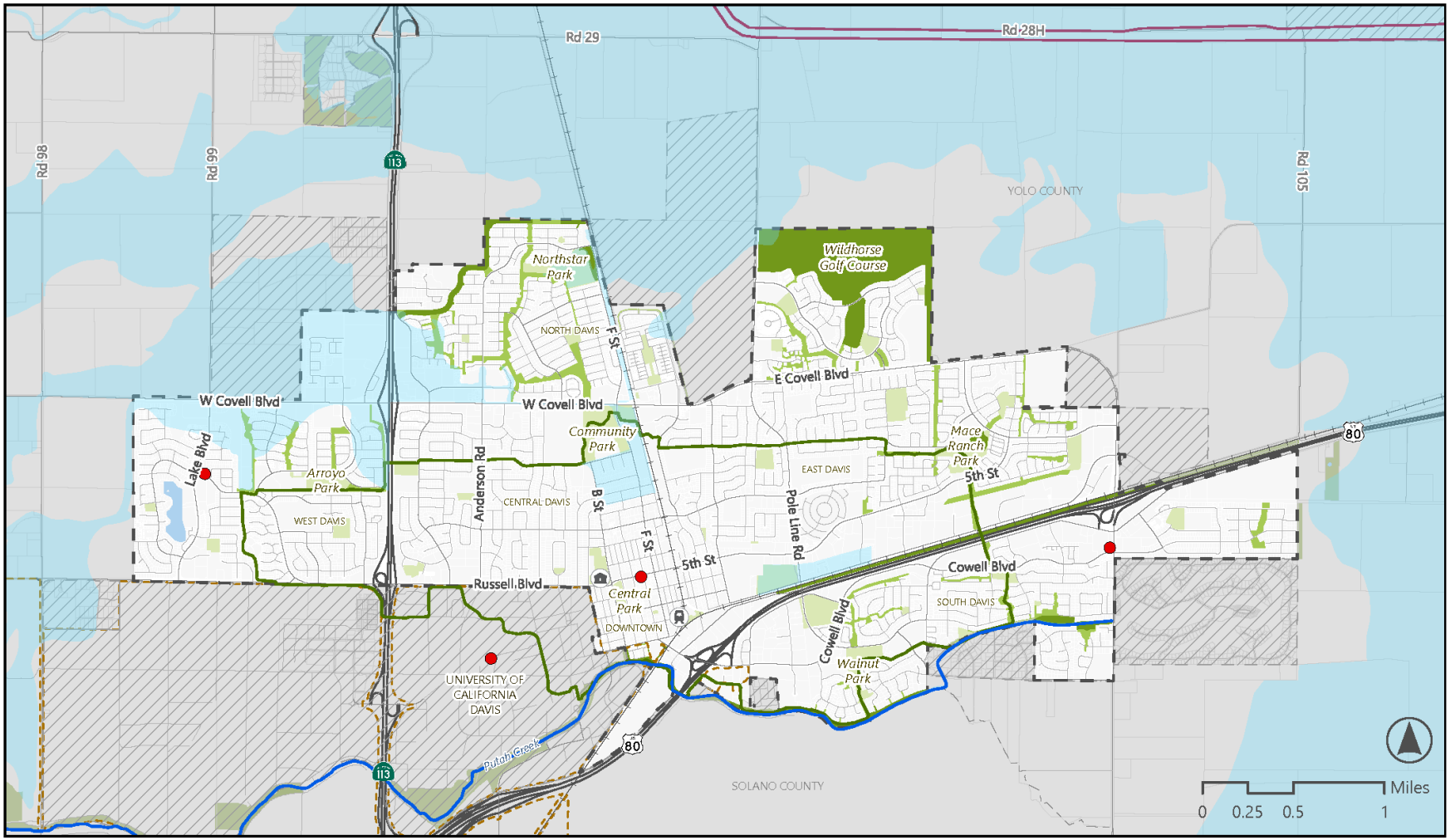
. Davis is protected by levees and the Yolo Bypass, which can flood and impact parts of Davis. The city's 100-year flood zone stops at the west levee along the Yolo Bypass, which is designed to protect Sacramento from flooding. Future plans to enlarge the bypass are underway, which would increase its capacity. While Davis is not directly within the most severe inundation zones, it is still at risk from flooding due to the natural floodplain and the potential for levee failures. Monticello Dam on Putah Creek helps control floodwaters in the region. The dam's reservoir and levee system on Putah Creek contribute to the city's flood protection. The city is located within the dam inundation zone for Monticello Dam (Lake Berryessa). As a Bureau of Reclamation facility, dam inundation mapping is not publicly available, but information shared with the City indicates that failure of this dam would inundate large parts of Davis. This inundation mapping shows that flooding in the city would not be much greater than a 100-year flood, which is attributed to the 23-mile distance between the dam and the city. The Yolo County Flood Control and Water Conservation District and the State Department of Water Resources provide flood control services outside of the city. The Department of Water Resources is primarily responsible for maintaining the levees in the Planning Area.[6]

Following widespread levee failures and flood damage, FEMA mandated certification of existing levees based on 1986 design and maintenance standards. Despite the Yolo County levees' unchanged quality, they failed to meet these standards by the mapping deadline. Consequently, by spring 2010, tens of thousands of Yolo County residents were required to purchase flood insurance.

- Areas downstream of the Monticello Dam and the levee systems are at greater risk of dam inundation and should be notified and educated on the potential risks associated with this hazard.
- Development within these areas should identify possible flood mitigation improvements that can reduce both flood and inundation impacts.

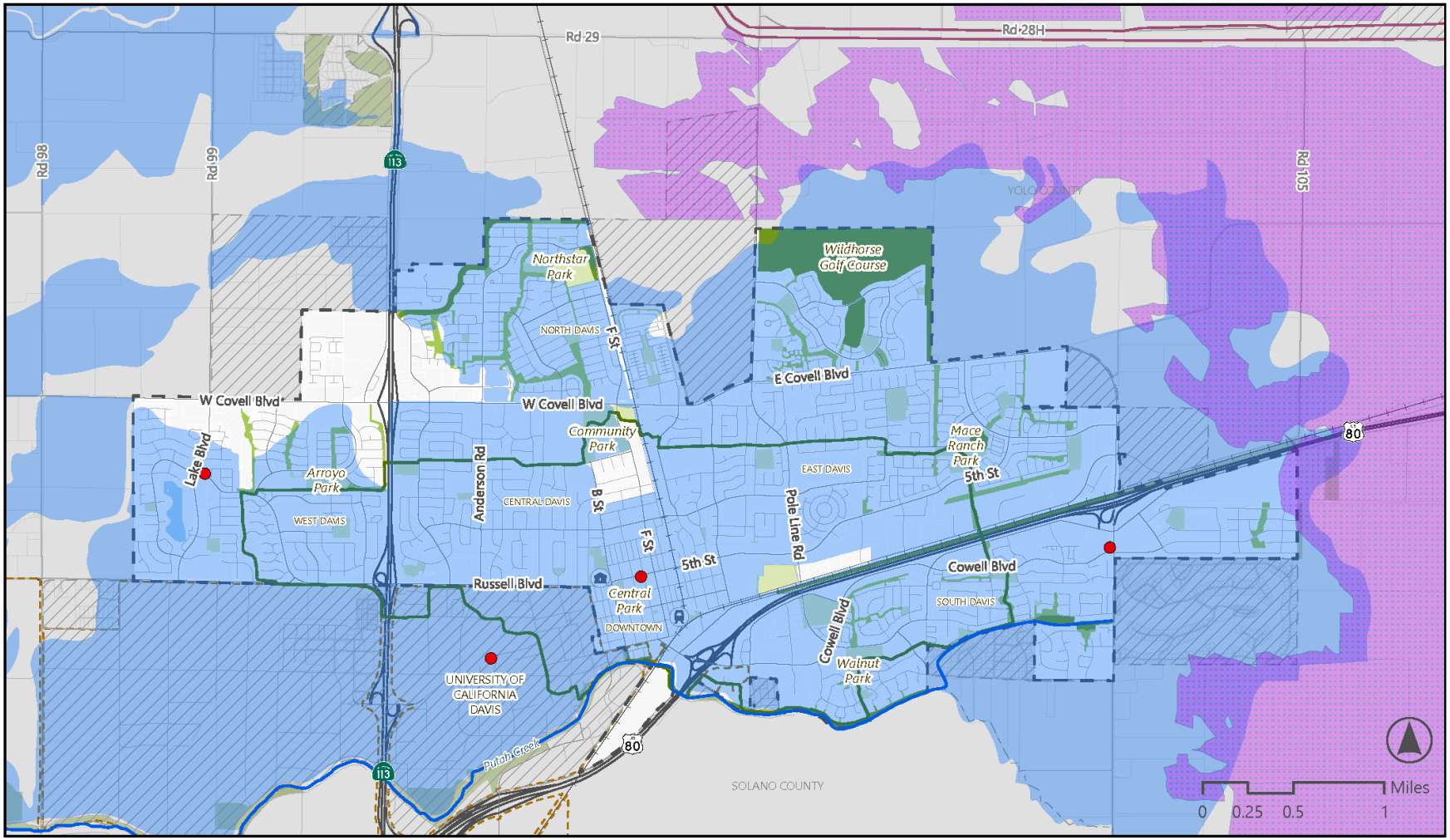
[6] 2007 Davis General Plan: Section VII Community Safety, Chapter 19: Hazards

Figure 5. 100 Year FEMA Flood Zone



Source: City of Davis (2025), UC Davis (2025), Yolo County (2025), CalTrans (2025), California Department of Fish and Wildlife (2025).

Figure 6. 200 and 500 Year Floodplains



Source: City of Davis (2025), UC Davis (2025), Yolo County (2025), CalTrans (2025), California Department of Fish and Wildlife (2025).

Wildfire

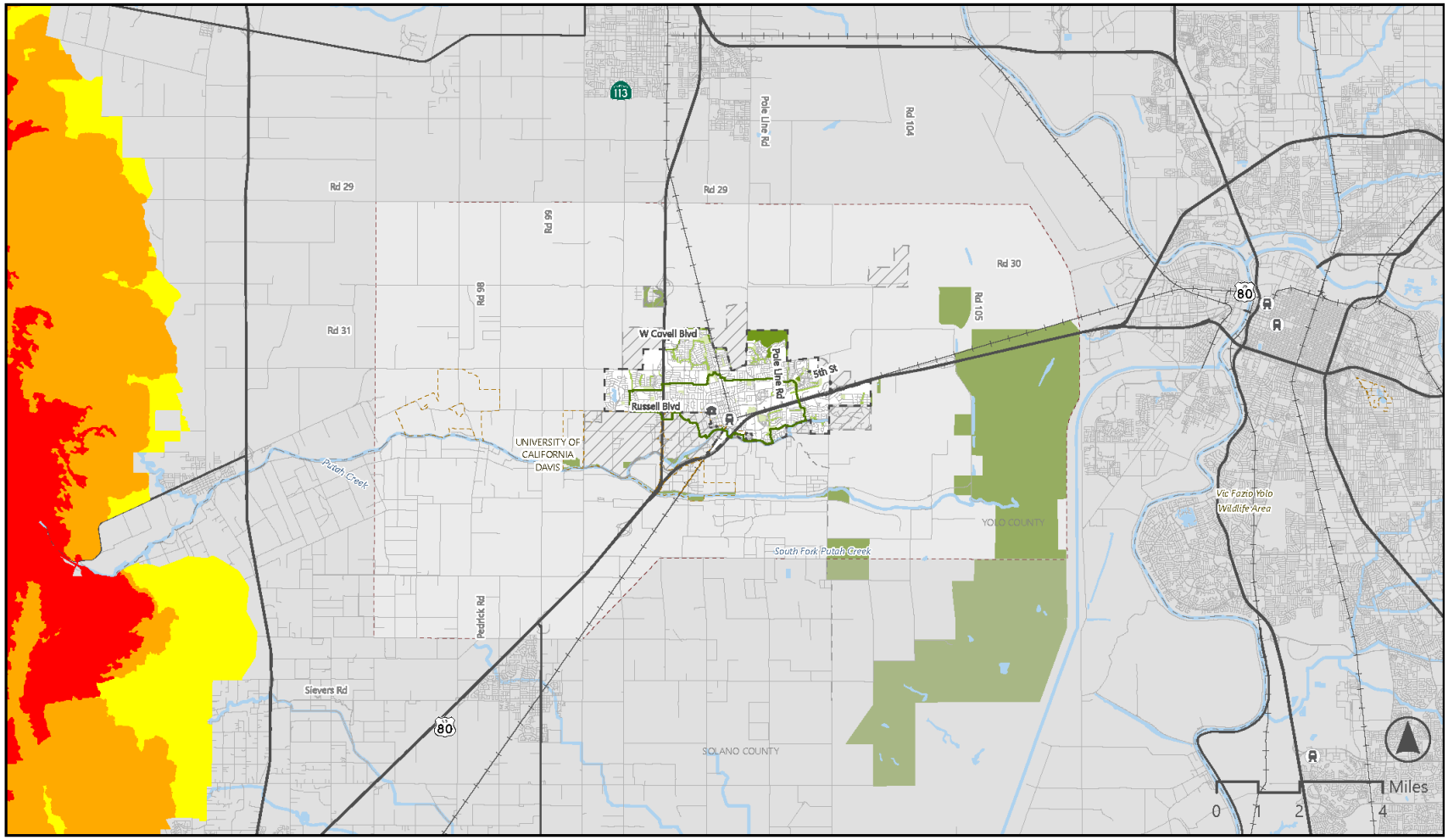
Davis is generally considered to be at low risk of direct wildland fire impacts, especially compared to other areas in the county with more extensive wildland areas. However, Davis, like the rest of the Central Valley, can experience significant indirect impacts from smoke and ashfall generated by wildland fires in the nearby mountains and foothills.[7]

The city is not located near any California Department of Forestry and Fire Protection (CAL FIRE) identified Very High Fire Hazard Severity Zones (VHFHSZ). This classification is used in California to designate areas with a very high risk of wildland fires. These zones are identified by CAL FIRE and are used to establish specific requirements for building construction, vegetation management, and wildland fire preparedness. Although Davis is not considered to have wildland fire danger, the presence of vegetation and the proximity to structures could still present fire danger to residents. **Figure 7** depicts the VHFHSZs near the city and in the larger region of Yolo County.

- The city has a low direct impact from wildland fires but can be affected by significant indirect impacts like smoke and ashfall.
- Defensible space and other wildland fire protection practices, while not required by law in the city, could be recommended for residents and businesses in the areas of the city where the risk may be higher than average.

[7] "Hazards | City of Davis, CA." City of Davis. Accessed June 10, 2025. https://www.cityofdavis.org/city-hall/emergency-information/hazards.

Figure 7. Fire Hazard Severity Zones



City of Davis
Sphere of Influence
Planning Area
UC Davis Campus
County Boundary

Publicly Accessible Open Space
Greenbelts
Parks
Publicly Accessible Open Space Outside the Planning Area
Lakes

Amtrak Station
City Hall
Rail Lines
Highways
Roads
Bike Loop
Rivers/Creeks

Fire Hazard Severity Zones
Very High
High
Moderate
Non-Wildland (Unzoned LRA)

Source: City of Davis (2025), UC Davis (2025), Yolo County (2025), CalTrans (2025), California Department of Fish and Wildlife (2025).

Severe Weather Phenomena

The information provided below is limited to severe weather hazards, including extreme heat, drought, and wind. These discussions focus on historical and current conditions within the city.

Extreme Heat

Extreme heat is a period when temperatures are abnormally high relative to the normal temperature range. There are generally three types of extreme heat events:

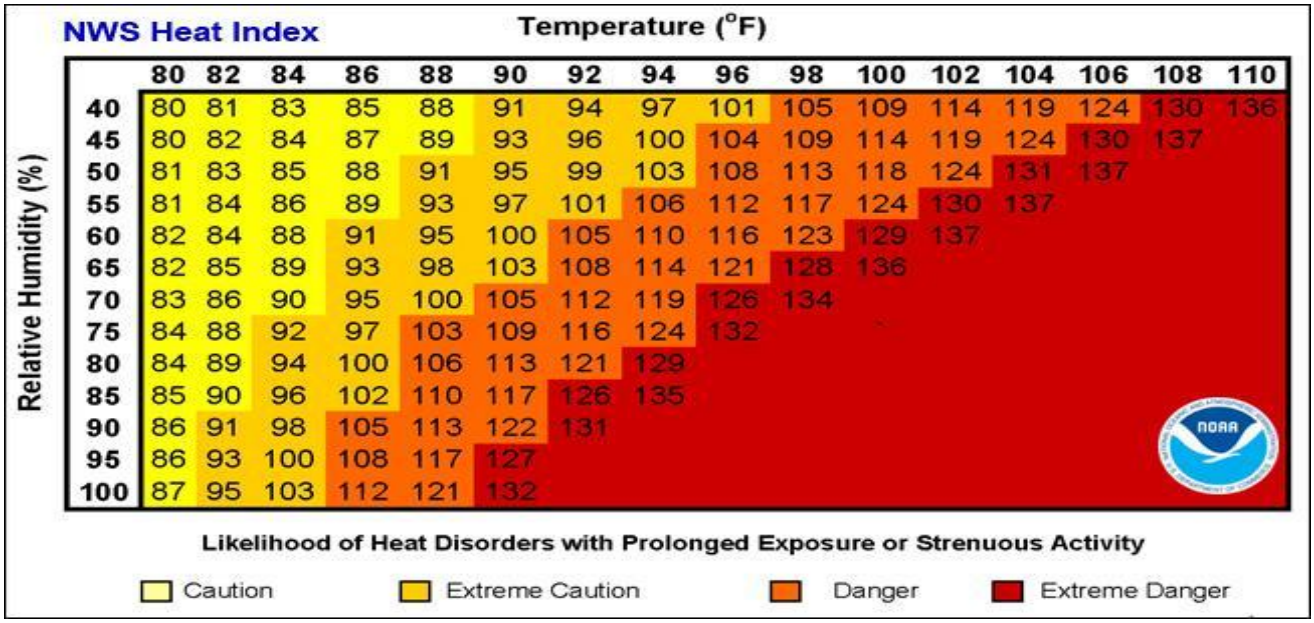
- **Extreme Heat Days:** a day during which the maximum temperature surpasses 98 percent of all historic high temperatures for the area, using the time between April and October from 1950 to 2005 as the baseline.
- **Warm Nights:** a day between April and October when the minimum temperature exceeds 98 percent of all historic minimum daytime temperatures observed between 1950 and 2005.
- **Extreme Heatwaves:** a successive series of extreme heat days and warm nights where extreme temperatures do not abate. While no universally accepted minimum length of time for a heatwave event exists, Cal-Adapt considers four successive extreme heat days and warm nights to be the minimum threshold for an extreme heatwave.

Extreme heat events will differ from region to region since different areas have different historically high temperatures. For example, an extreme heat day in Oakland will feel different than an extreme heat day in the Sacramento Region. This is because Humid conditions will make a day feel hotter, even though the temperature may be the same. The difference between the perceived and actual temperatures is known as the "heat index." To illustrate the effect of the heat index, a 90-degree day with 50 percent humidity feels like 95°F, whereas a 90°F day with 90 percent humidity feels like 122°F. **Figure 8** shows the National Oceanic and Atmospheric Administration (NOAA) 's National Weather Service Heat Index.

- An extreme heat day in Davis involves a temperature exceeding 103.9° F. Warm nights involve a temperature greater than 64.9° F.
- Historically, the city has experienced an average of 4 extreme heat days from 1950 to 2005. During this same period, the city experienced one 3-day heatwave on average every year.
- By the mid-century (2035-2064), Davis is projected to experience between 22 and 28 extreme heat days, and by the end of the century (2070-2099), this number could increase to between 30 and 50 extreme heat days annually.[8]

[8] Cal Adapt Local Climate Change Snapshot Tool

Figure 8. NOAA National Weather Service Heat Index



Severe Wind

Wind is simply the movement of air caused by differences in atmospheric temperature. High-pressure air will naturally move to areas of low pressure. Usually, the distance between these high- and low-pressure zones is far. When this happens, air will flow dramatically, creating high-speed winds. In Northern California, strong, dry downslope winds are often referred to as "North winds" or sometimes as "Diablo winds." These winds can significantly exacerbate wildfires and the damage caused, particularly during the autumn and spring.

Areas along and west of I-5 in the Sacramento Valley and Carquinez Strait are prone to strong winds. These winds can gust up to 45 to 55 mph, making driving difficult, especially for high-profile vehicles. These strong winds are often associated with northerly winds and can lead to unsecured objects being blown around, tree limbs falling, and potential power outages.

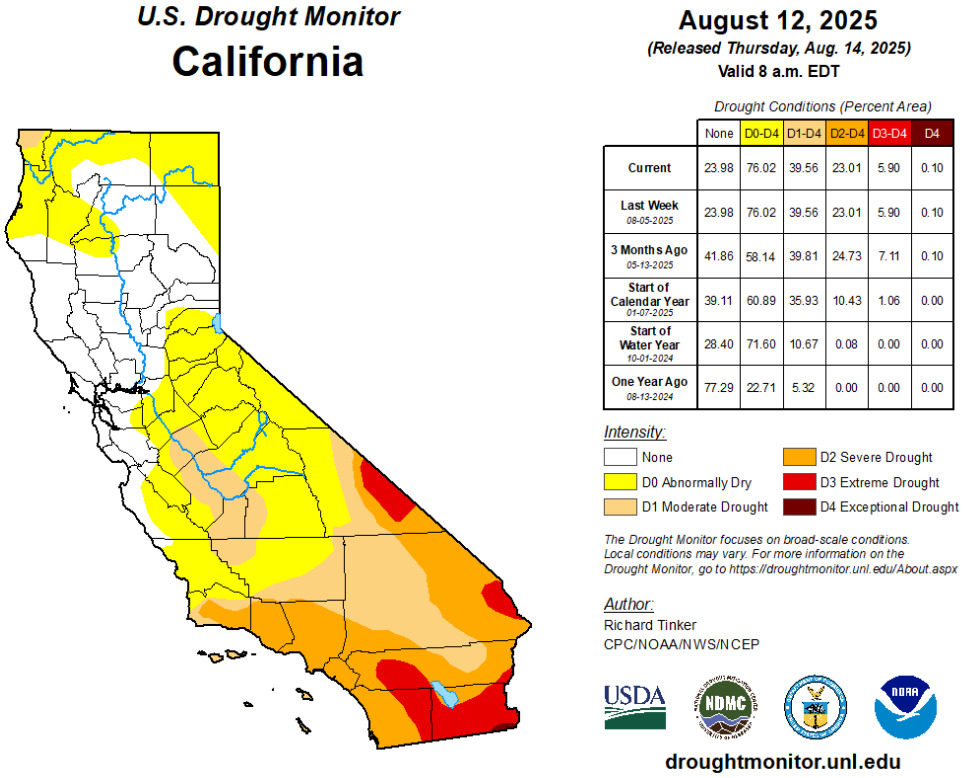
- Since "north wind" events can occur several times throughout the year, they are one of the most frequent hazard events that affect the city; however, significant incidents are not as common. Generally, 2-4 wind events occur on an annual basis that have the potential to cause damage.
- Significant wind events can exacerbate fire conditions within the region, which could impact residents, businesses, and city services.
- Strong, northerly winds have caused damage in Davis, particularly during winter storms and atmospheric river events, leading to downed trees, power outages, and property damage.

- September 30, 2019, A tornado touched down in a California field near Davis as weekend thunderstorms swept through the central part of the state, dropping rain and dime-sized hail. Considered a landspout tornado, these tornadoes originate below the storm and have a large condensation funnel that leads into the thunderstorm, allowing for heavy rain and hail in addition to high velocity winds.[9]

Drought

California often experiences droughts when there's a prolonged period of limited precipitation. Rain reaches the state through atmospheric rivers (air currents high in the atmosphere carrying moisture) and the El Niño Southern Oscillation (ENSO) cycle. The ENSO has two phases: El Niño, a warm and wet phase, and La Niña, a dry and cold phase. Droughts in California usually occur when there are fewer atmospheric rivers or an active La Niña phase, leading to lower rainfall. Additionally, even if one area isn't experiencing a drought locally if the water source regions are experiencing drought conditions, it can still impact the local area. Figure 9 identifies the current US Drought Monitor drought conditions within California. Davis and Yolo County are not currently experiencing drought conditions.

Figure 9. Current Drought Conditions

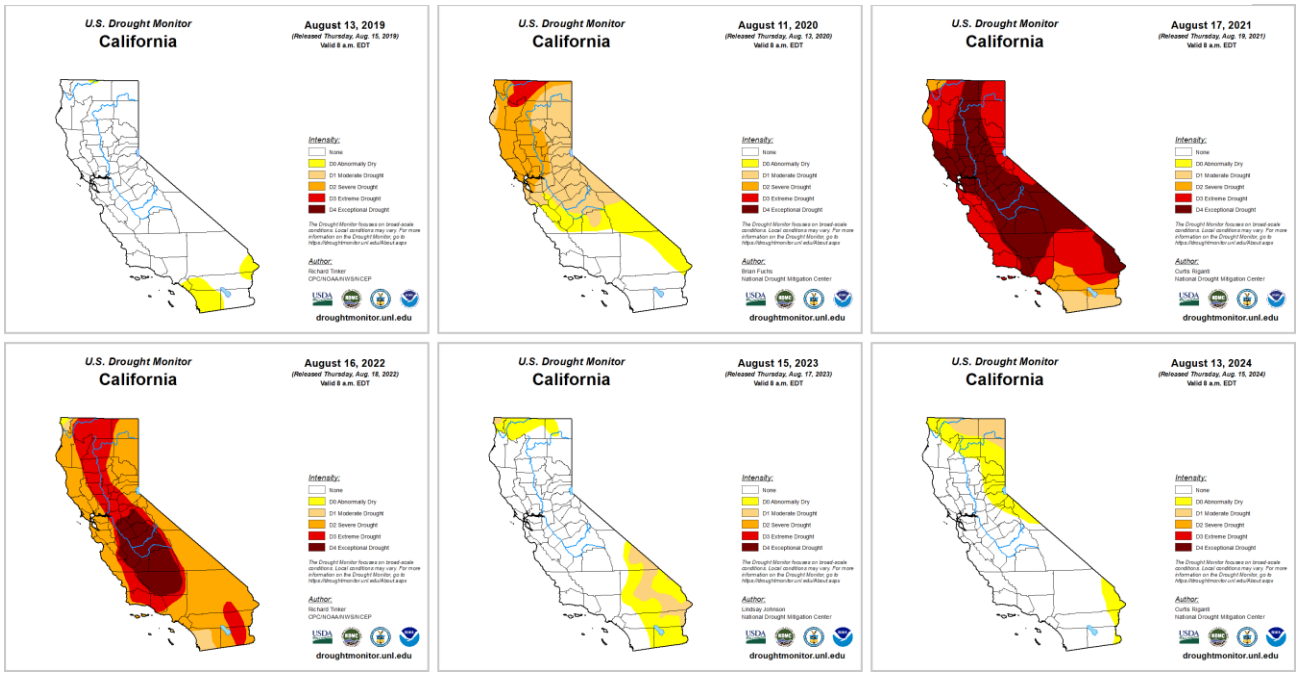


[9] Gomez, Carly. Tornado touches down in Davis as early Autumn storm rips through Norther California, September 30, 2019.

Despite this Davis and the surrounding region have seen multiple multi-year droughts over the last 25 years. The droughts have ranged from below normal to critically dry, with the 2012-2014 drought being notably severe. The average drought duration in California tends to be around 2-3 years, but some drought episodes last longer. Figure 10 illustrates the drought conditions for California between 2019 and 2024 (during the second week of August). During this six year period many parts of the state experienced severe to exceptional drought conditions.

- Northern California is not currently considered to be in a drought condition, while other parts of Southern California and portions of the Sierra Nevada mountain range—are experiencing moderate to extreme drought conditions due to lower-than-average precipitation.
- Communities that rely on water supplies from these parts of the state may feel the effects of drought versus communities that source their water supplies locally from Northern California. Currently, the City of Davis Utility Department sources 80% of its water from the Sacramento River, and the remaining 20% comes from groundwater and the local aquifer.
- The Sacramento River watershed is highly drought-sensitive. During droughts, reservoirs like Lake Shasta, a key source feeding the river, experience dramatically reduced water levels — for example, Lake Shasta storage dropped to roughly half its average capacity in recent dry years. This leads to substantial cuts in water deliveries to urban water suppliers like Davis, as well as agricultural users downstream. Water allocations under drought conditions can be drastically reduced (sometimes as low as 0-18% of contracted amounts). This reduction affects availability for drinking water, irrigation, and ecosystem needs and increases water scarcity stress in Davis.
- There are seven active groundwater wells throughout town, with most of the city's potable water supplied by five deep aquifer wells.

Figure 10. 2019-2024 Drought Conditions (August)



Emerging Hazards (Climate Change Adaptation)

Climate Action and Adaptation Plan

The City of Davis 2020-2040 Climate Action and Adaptation Plan (CAAP) is the result of the community's vision to attain 2040 carbon neutrality by building transformative networks and policies. The CAAP is a living document that shares how the City will address climate change and collaborate with residents and businesses. The CAAP provides a framework for further developing and elevating these efforts and describes achievable, measurable greenhouse gas (GHG) emissions reduction and climate change adaptation actions that align with the City's goals and priorities. The CAAP actions will prepare the community for climate change impacts, improve public safety, address environmental justice, and enhance the quality of life for residents. The CAAP will be updated every five years beginning in 2025, and greenhouse gas (GHG) inventories will be conducted biannually.

A Climate Change Vulnerability Assessment (VA), conducted as part of the City's CAAP and in accordance with California Government Code Section 65302 (g), investigates the potential impacts of climate change hazards on city infrastructure, natural resources, residents, and businesses. Like many California communities, Davis faces climate change impacts, including extreme heat, increased flooding and precipitation, drought, and poor air quality from wildfire smoke. The VA identified how these impacts will likely intensify by the middle and end of the century. The hazards potentially impacting Davis the most include Extreme Heat, Wildland Fire and Air Quality, Precipitation, and Drought.

- **Extreme Heat** – the number of extreme heat days and heat waves are expected to increase in frequency and intensity. These may have serious health-related impacts, degrade air quality, and increase the gradual wear and tear on infrastructure (energy grid, mechanical systems, roadway pavement, etc.), increasing the cost and frequency of maintenance.
- **Wildland Fire and Air Quality** - Warmer spring and summer temperatures and earlier snowmelt could lead to more frequent and intense wildland fires. Furthermore, wildland fires occurring elsewhere in Yolo County and California may cause periods of poor air quality in Davis. With rising wildland fire risk, the frequency and severity of wildland fire impacts are projected to increase, leading to a wider range of health consequences for those exposed to smoke and particulate matter, from simple eye irritation to potentially fatal conditions like heart failure, reduced lung function, or even death.
- **Precipitation** - More intense precipitation events, delivered in a shorter wet season, are projected to increase annual precipitation levels. An increase in severe storms is likely to increase the frequency of flooding events, which could impact lives, structures, property, roads, emergency services, and critical facilities. Quantitatively,

Northern California—including Davis in the Sacramento River region—has historically averaged around 38 inches of precipitation per water year, and the 2025 California Hydrology Update reported about 37.9 inches through June 30, 2025, which is 107% of average for that region. Year-to-year variability remains high.

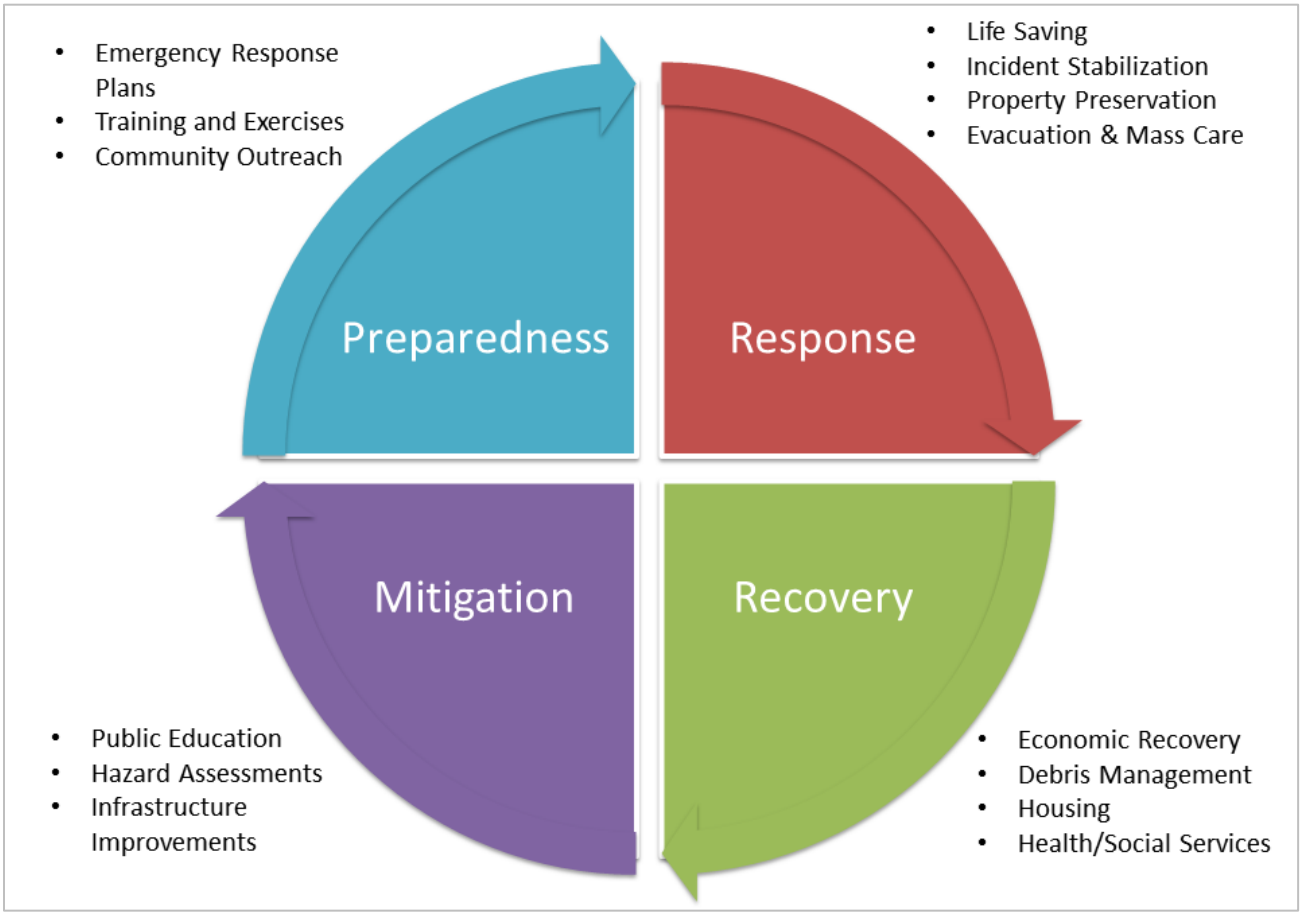
- **Drought** - Changes in precipitation patterns could increase the frequency of prolonged droughts, and as a result, the city's surface water and groundwater supply allocation may be reduced substantially. Potential water supply and quality issues could also affect the region's agricultural economy and those that depend on it. Drought-driven changes in precipitation and warming climate are projected to reduce Davis's surface water allocations by approximately 30-60% during drought years, with required groundwater allocation reductions of about 20-40% to avoid over pumping. These reductions reflect ongoing trends to more frequent, severe, and prolonged drought events, lasting on average 2-3 years but with increasing risk of multi-year droughts longer than 5 years. Such water supply constraints will also negatively impact regional agricultural productivity and water quality.

Emergency Management

The City's emergency management personnel work closely with the Yolo County Office of Emergency Services (OES) in the event of an emergency. If Davis emergency services capabilities become overwhelmed or additional resources are needed, Yolo County OES can assist as their function is to coordinate county-wide emergency planning, response, and recovery. The University of California, Davis, has its own internal emergency management system, including department-specific plans and safety coordinators. The City and Yolo County OES rely on FEMA's four phases of emergency management, as illustrated in Figure 11.

Key components of this program include the County's adoption of the 2023 Yolo County Operational Area Hazard Mitigation Plan, Emergency Operations Plan, and evacuation plans, which support City functions during emergencies and assist in day-to-day activities.

Figure 11. The Four Phases of Emergency Management



2023 Yolo County Operational Area Hazard Mitigation Plan

The Yolo County Operational Area Hazard Mitigation Plan (HMP) was approved by FEMA on October 15, 2024 and subsequently adopted by the County Board of Supervisors. As a countywide plan, the hazard addressed include levee failure, wildfire, drought, extreme heat, flooding, high wind, dam failure, earthquake, freeze, land subsidence, fog, tornado, landslide, and volcano. Those marked in bold text are hazards most likely to affect the City of Davis.

Currently, the City of Davis does not have an adopted Annex to the Yolo County Operational Area Hazard Mitigation Plan. The City participated in the overall update process conducted by the County; however, the annex that is prepared during this process was never completed, and therefore the City does not have a local hazard mitigation plan to rely on for compliance with federal and state requirements.

Emergency Operations Plan

The Davis Emergency Operations Plan (EOP) addresses the City's planned response to extraordinary emergency situations associated with natural disasters, technological incidents, and national security emergencies in both war and peacetime. This plan supports the City's preparedness functions and is designed to be read, understood, and exercised before an emergency. The EOP provides the planning basis for hazard identification, hazard mitigation, disaster preparedness, emergency response, and recovery efforts.

Evacuation

Since there are a variety of hazards within the city that could impact businesses and residents, it is vital to identify critical routes for evacuation purposes. **Figure 12** identifies recommended evacuation routes along many of the major thoroughfares throughout the city. While these routes are recommended, they are not anticipated to be the only routes used for evacuation purposes. Future evacuations will consider the type of hazard event, areas impacted by the event, expected migration from areas of impact, and establishment of the safest routes necessary to move people to safety.

The Yolo County Office of Emergency Services has created the Yolo County OES "Know Your Zone" website. This project analyzed and mapped all evacuation routes throughout the county and individual cities/jurisdictions and created interactive maps allowing residents to learn which evacuation route is best for their address and plan for evacuation. **Table 2** lists some of the larger evacuation routes out of the city when evacuation becomes necessary.

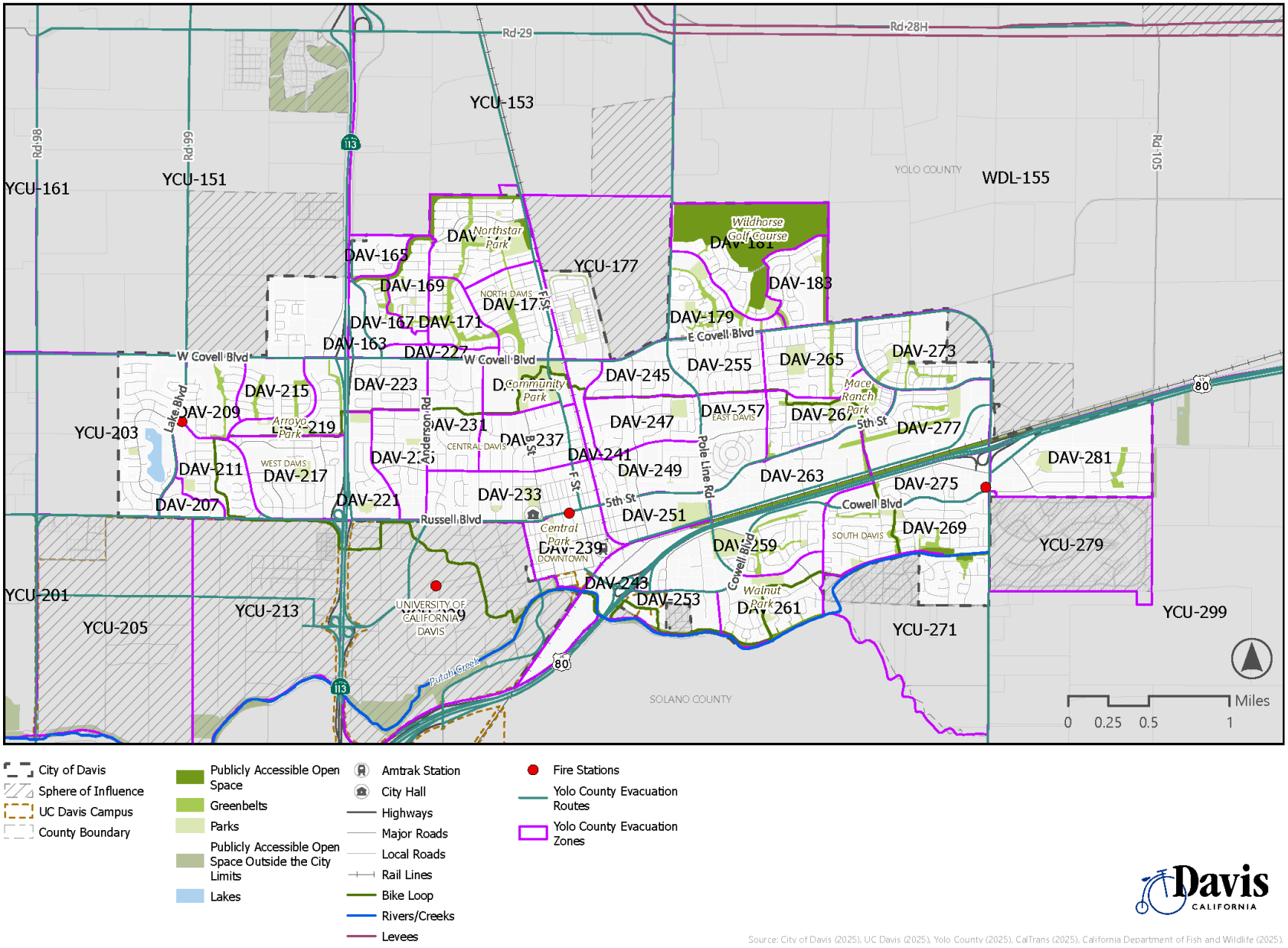
Table 2. Evacuation Routes

North/South	East/West
State Route (SR) - 113	Interstate (I) -80
H St	W Covell Blvd/E Covell Blvd
F St	W 8th St/E 8th St
Arlington Blvd	Cowell Blvd
Lake Blvd	Russel Blvd
Oak Ave	Villanova Dr
Anderson Rd	W 14th St
Mace Blvd	2nd St
La Rue Rd	Alhambra Dr

To better understand the city's evacuation constraints and meet the requirements of SB 99 and AB 747, evacuation routes will need to be analyzed to determine:

- Areas where routes are lacking or inadequate
- Areas where the circulation network is undersized or inefficient
- Roadway extensions or modifications that can enhance evacuation.
- Addressing these issues will play a key role, as a critical evacuation concern for the City is the connectivity across Interstate (I) 80 and State Route (SR) 113. These freeways are the primary routes out of the city and will have to accommodate large volumes of traffic.

Figure 12. Evacuation Zones and Routes



Source: City of Davis (2025), UC Davis (2025), Yolo County (2025), CalTrans (2025), California Department of Fish and Wildlife (2025).