

CULTURAL RESOURCES

Asset Profile: Cultural Resources

Marin County is rich with history. Miwok Native Americans inhabited the area for thousands of years and around 600 identified village sites remain throughout the county.¹²⁷ In the early 1800's, Mexican governors of Alta California issued 21 land grants and founded the Mission San Rafael Arcángel as a hospital to treat Native Americans dying of introduced diseases.¹²⁸ The Gold Rush increased demand for beef and dairy, leading migrants to settle in Marin, establishing ranches and businesses.¹²⁹ New ferries, trains, and bridges enabled more access allowing bayside communities to become commercial fishing, water based recreation and vacation hubs, as well as neighborhoods for commuters working in San Francisco¹³⁰. Many of Marin's Bayside communities have maintained their historic characters and downtowns with architectural styles including Shingle Style, Arts and Crafts, Mission Revival, Italianate, and Modern. Julia Morgan, Bernard Maybeck, Willis Polk, Frank Lloyd Wright, and Joseph Eichler are amongst the renowned architects who built in Marin County.¹³¹ The following are key sea level rise vulnerabilities related to cultural resources:

- Tidal and storm surge flooding can destroy bayside archaeological sites and/or compromise data acquisition.
- Historic buildings along Marin's shoreline could be vulnerable to tidal and storm surge flooding, including homes and businesses in Larkspur, Sausalito, Belvedere, Tiburon, San Rafael, and Novato.
- Several publicly accessible sites within state or federal parkland could be vulnerable. Failure to protect these sites could lead to economic and intrinsic losses.
- Additional vulnerabilities lie in lack of comprehensive data on Marin's archaeological resources. Because the shoreline is only partially surveyed, potential losses in unmapped areas cannot be fully assessed.

IMPACTS AT-A-GLANCE: SCENARIO 6

More than 90 historic buildings in private ownership	Archaeological Resources
6 National Register of Historic Places Sites	Public Sites in State and Federal Parkland
Lack of comprehensive surveys	State Parks National Park Service Local jurisdictions Marin County Property Owners Graton Rancheria Federated Indians



Downtown Sausalito Historic District is a social and economic hub. Credit: Marin County CDA

¹²⁷ Wikipedia, Marin County California. Last updated July 3, 2016. en.wikipedia.org/wiki/Marin_County,_California#History

¹²⁸ Futcher, Jane. 1981. Marin, The Place, The People.

¹²⁹ Ibid.

¹³⁰ Marin County Community Development Agency. 2007. Marin Countywide Plan.

¹³¹ Ibid.

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Vulnerable Assets

Cultural resources can be defined as “physical evidence or place of past human activity: site, object, landscape, structure; or a site, structure, landscape, object or natural feature of significance to a group of people traditionally associated with it.”¹³² Cultural resources analyzed in this assessment are archaeological sites and locally, state, and federally recognized historical structures.

Key resources include historic districts in Sausalito, Belvedere, Tiburon, San Rafael, Hamilton in Novato, and China Camp State Park. Often hubs for local businesses and heritage tourism, historic districts can play an important role in community economic development and sustainability. Historic sites may contribute to local sense of place, community character, and cultural identity. Historical sites can serve as museums or interpretive centers for educational purposes. Environmentally, the continued use of older buildings is generally much more energy efficient than new construction, thus helping to reduce greenhouse gas emissions.¹³³ Archaeological sites can provide scientific data such as plant and animal species that thrived under past climactic conditions which could be useful in informing future natural resource management plans.

Historic buildings are physically vulnerable to flooding just like any other building (see [Table 23](#)). However, additional considerations for historic buildings include:

- Direct/Tangible:
 - Increased sensitivity due to age/condition leading to more severe physical damage to building fabric.¹³⁴
 - Damage or destruction to character defining features
 - Damage or destruction of historic artifacts within the building
- Direct/Intangible: Irreplaceable loss of cultural heritage from deterioration/destruction of building or artifacts contained within building¹³⁵
- Indirect/Tangible: Loss of tourism revenue¹³⁶

¹³² National Park Service website. Last updated July 22, 2016. www.nps.gov/acad/learn/management/rm_culturalresources.htm

¹³³ National Trust for Historic Preservation. 2011. *The Greenest Building: Quantifying the Environmental Value of Building Reuse*.

¹³⁴ Stephenson, V. and D’Ayala, D. *A New Approach to Flood Vulnerability Assessment for Historic Buildings in England* (2014), 1036.

¹³⁵ *ibid*

- Indirect/Intangible: Loss of sense of place.¹³⁷

Due to available information, this Profile focuses on direct/tangible losses, primarily structural damage to historic buildings. Tourism revenue is not available for all of the sites therefore; indirect/tangible losses cannot be fully assessed. Additionally, while losing these sites would likely have negative cultural identity and sense of place impacts, quantifying the loss is a challenge with no known US precedents, and is beyond the scope of this report.

A handful of the vulnerable historic sites including, China Camp State Park’s Shrimp Shed, Marinship’s Bay Model Visitor Center and Hamilton Army Air Field Fire House museum collections are open to the public. National Park Service’s 2016 *Cultural Resources Climate Change Strategy* compiles possible types of impacts to museum collections from increased flooding, inundation, increased storm surge, shoreline erosion and more, and consequently, the collections could face increased rusting, corrosion, rot, mold, mildew, infestation, swelling, direct damage, or destruction.¹³⁸

To date, Marin County’s Architectural Commission has identified only one historic structure,¹³⁹ though it is outside the study area for this assessment.

Archaeological Sites

The State of California recognizes 630 archaeological sites in Marin County including, permanent Miwok settlements, seasonal camps, hunting camps/special use sites, and petroglyphs. The Anthropological Studies Center at Sonoma State University is inventorying additional sites in anticipation of sea level rise and erosion. The blue lines depicted in [Map 43](#) represent sixty-nine miles of surveyed public lands, and eight miles that are partially surveyed. Much of the southern Marin shoreline is not applicable for the survey, as depicted in red. The marshlands in Corte Madera and Larkspur, China Camp State Park, and St. Vincent’s spanning up to Bel Marin Keys could feature archeological sites.

¹³⁶ *ibid*

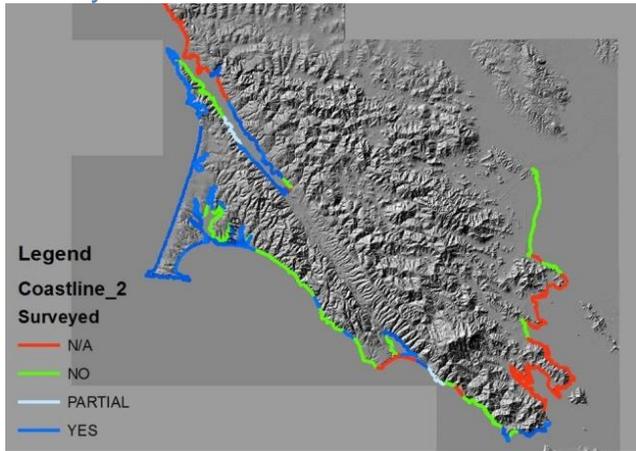
¹³⁷ *ibid*

¹³⁸ *ibid*, 22-23

¹³⁹ Bill Kelley and Marty Zwick (Marin County Architectural Commission), personal communications July 2016.

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Map 43. Archaeological surveying in Marin County



Source: Anthropological Studies Center, 2015

Table 46. Number of Known Vulnerable Archeological Sites

Near-term	3
Medium-term	5
Long-term	19

Source: Marin County CDA

Based on the County's limited available spatial data, 19 sites could be vulnerable spanning all of the scenarios. Most of the sites are at or near the edge of the Bay. Vulnerable sites include permanent settlements represented by shell mounds or middens associated with marshes and other locations at or near the edge of the bay where shellfish/marine resources were available. Most of the sites are subject to tidal flooding at MHHW, with an additional handful subject to temporary flooding from seasonal storm surges. In addition to total submersion, sites could be vulnerable from direct physical flood damage, destruction/loss of artifacts, post-flood subsidence, changes in pH, disturbance during flood clean-up, and more.¹⁴⁰ Specific locations of archaeological sites are confidential.

Sites located along sheltered bays may be protected from destructive storm surges; however, once a site becomes submerged, data recovery

¹⁴⁰ Rockman, Marcy, Marissa Morgan, Sonya Ziaja, George Hambrecht, Alison Meadow. 2016. *Cultural Resources Climate Change Strategy*. Cultural Resources, Partnerships, and Science and Climate Change Response Program, National Park Service, 22-23

through "wet site archeology" becomes more difficult, dangerous, and costly.¹⁴¹ Therefore, it is important to conduct cultural resource surveys prior to inundation to document what will be lost.¹⁴² At this time, without certified and dedicated staff or financial resources, Marin County's capability to conduct a comprehensive vulnerability assessment of archaeological sites is limited.

Fort Baker

National Register of Historic Places

Vulnerable Resources: Marine Hoist and Dock, Refueling Dock and Marine Railway

Scenarios: All

Flood Depths: 0-7'10"+100-year storm surge

Primary Building Materials: Concrete, Wood, Steel

Fort Baker was acquired by the Federal Government in 1866 and served as an Army Post until the mid-1990s when it became part of the Golden Gate National Recreation Area. Two structures, the Marine Hoist and the Refueling Dock and Marine Railway (replacement value of \$2,142,003¹⁴³) the low lying area looking out to Horseshoe Bay could be vulnerable to flood depths of more than 4 feet in the near-term and nearly 8 feet with storm surge waters in the long-term.



Horseshoe Cove and Fort Baker (circa 1950s) Credit: Golden Gate National Recreation Area Park and Archives Record Center

¹⁴¹ *ibid*, pg. 69.

¹⁴² *ibid*, pg. 70

¹⁴³ 2016 dollars

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In the long-term flooding could impact Bridgeway and Downtown Historic District buildings lining its west side. Credit: Marin County CDA

Sausalito

National Register of Historic Places (Downtown Historic District)

National Park Service Certified Historic District

City of Sausalito Historic Resources Inventory Listing

Vulnerable Resources: 26 National register district contributing sites, 17 noteworthy structures, 2 landmark buildings

Scenarios: All

Flood Depths: 09'04"+100-year storm surge

Primary Building Materials: Wood, concrete, brick, stucco, concrete

Prior to development of the Golden Gate Bridge, Sausalito was an important hub for rail, car, and ferry traffic. During World War II, the city developed rapidly as a shipbuilding center. The Downtown Historic District centers on a ferry terminal with service to San Francisco, and remains an important area for commerce, and as a popular visitor destination. The district is a National Park Service Certified Historic District.¹⁴⁴

Sea level rise is projected to inundate parts of Sausalito's Downtown Historic District in the near-term, with storms expanding the vulnerable area and exacerbating impacts. By long-term scenario 6, 26 sites could be vulnerable.

Both water and land routes to Sausalito's Downtown Historic District could be vulnerable in the near-term. GGF's Sausalito Ferry could experience inundation at MHHW in the near-term. In the long-term, parts of Bridgeway could be tidally flooded, and impacts will worsen with storms.

¹⁴⁴ Office of Historic Places, accessed July 14, 2016. http://ohp.parks.ca.gov/?page_id=27283

In other parts of Sausalito, a handful of private properties on the city's Historic Resources Inventory could also be vulnerable at varying scenarios. Sausalito's Ark Row District includes seven noteworthy properties, vulnerable to more than six feet of water at MHHW in the near-term, and more than nine feet of water at MHHW in the long-term. An additional ten other properties could be vulnerable in the long-term, including the original firehouse (eight of the ten only subject to storm surges). Lastly, two of Sausalito's landmark buildings, Castle by the Sea and the Ice House, could be vulnerable to a 100-year storm surge in the long-term.

Marinship, Sausalito

Potential National/State Register Sites

Vulnerable Resources: 10 potential historic resources

Scenarios: All

Flood Depths: 2'1" - 2'8"+100-year storm surge; flood depth data limited

Primary Building Materials: Concrete, wood, stucco, steel

The former Marinship yard, an approximately 210-acre site, was one of six Emergency Shipyards in the San Francisco Bay Area established during World War II. Marinship was built on bay fill, and some areas, such as Heath Way, have experienced approximately five feet of subsidence since 1943 based on photographic records.¹⁴⁵ In 2010, the Marinship Historic Context Statement inventoried and recorded every major World War II era building and structure. The effort concluded:

- Marinship retains a higher degree of architectural integrity than any of the other Bay Area World War II emergency shipyards,
- Eight surviving buildings could form a California Register eligible district in the southernmost portion of the district,
- Two sites are individually eligible for the National Register of Historic Place, and
- Four sites are individually eligible for the California Register of Historic Places.

Since the report was released, the WWII machine shop has received National Historic Landmark

¹⁴⁵ Robin Petravic (Heath Ceramics), personal communications. July 2016.

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designation. The site is slated for renovation and repair. The remaining sites can be considered potential historic resources.

In the near term, shipways that are part of Building 23, the Marinship Shipways and Offices, could be vulnerable to 10 inches of sea level rise. In the long-term, two buildings, the Marinship Maintenance Garage and the Marinship Mold Loft and Yard Office, could be vulnerable to tidal flooding at depths deeper than two feet. Both buildings were erected in 1942 with cinderblock construction and could be vulnerable to standing water. Recently added to the National Register for historic places, the machine shop is also vulnerable and will be undergoing renovations.

Seven other properties could be vulnerable to the 100-year storm surge in long-term scenario 6 including Building 29 and Marinship Warehouse. This building serves as the Bay Model Visitors Center, and houses the US Army Corps of Engineers Bay Model, a working hydraulic scale model of the SF Bay-Delta completed in 1957.¹⁴⁶

Belvedere

Historic Resource Inventory database and local register
Vulnerable resources: 1 California Register of Historic Places site, 4 additional locally registered historic sites
Scenarios: All
Flood Depths: 6"- 3'2" + 100-year storm surge
Primary Building Materials: Wood



Gate 5 Road in Marinship. Jan. 2004. Credit: R. Petrav

¹⁴⁶ US Army Corps of Engineers Bay Model. Last updated August 18, 2016.
en.wikipedia.org/wiki/US_Army_Corps_of_Engineers_Bay_Model

Originally a fishing community, Belvedere was settled in the late 19th century and incorporated in 1896.¹⁴⁷ Vulnerable historic resources in Belvedere include:

- Properties on Beach Road, along the northwest edge of Belvedere Cove are vulnerable in the near term. Some of these properties were designed by well-known architect Albert Farr including, the Farr cottages/Farr apartments and the Belvedere Land Company. The China Cabin is also located here. This saloon was once housed by the S.S. China, built in 1866 to carry passengers from San Francisco to Asia.¹⁴⁸
- The Belvedere Presbyterian Church/City Hall/Community Center.



The 1905 Belvedere Land Company building, designed by Albert Farr.¹⁴⁹

¹⁴⁷ Belvedere, CA. Last updated January 9, 2017.
en.wikipedia.org/wiki/Belvedere,_California

¹⁴⁸ Belvedere-Tiburon Landmarks Society, China Cabin. Accessed January 18, 2017.
landmarkssociety.com/landmarks/china-cabin/

¹⁴⁹ Albert L. Farr. Last updated October 10, 2016.
en.wikipedia.org/wiki/Albert_L._Farr

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Tiburon

Local Historic Inventory for Downtown Tiburon/List of Buildings Included and Eligible for California State Historic Building Code

National Register of Historic Places (Peter Donahue Building)

Vulnerable Resources: 21 buildings

Scenarios: All

Flood Depths: 1'4" - 8'6"+100-year storm surge

Primary Building Materials: Wood

Vulnerable historic sites include more than 20 buildings along upper and lower Main Street. Built in the 1920s, original uses included saloons, apartments, a bank, hotel, grocery store, and butcher. Then and now, commercial uses provide commuters and visitors using the Tiburon Ferry Terminal with shops and restaurants. Several lower Main Street sites could be subject to tidal inundation in the near-term. Upper Main Street sites are subject to storm surge flooding in the long-term.

Just beyond downtown, the wood framed San Francisco and North Pacific Railroad Station House-Depot, or the Peter Donahue Building could be vulnerable to the 100-year storm surge. The building is listed on the National Register of Historic Places as the old station house at the ferry railroad terminus¹⁵⁰ and is the only surviving dual use terminal west of the Hudson River. The building now houses the Tiburon Railroad and Ferry Depot Museums. On the bottom floor is scale model of Tiburon circa 1900-1910.

Road access would be drastically compromised including permanent flooding of Main Street and Tiburon Blvd., the main thoroughfare connecting Tiburon with Highway 101. Water access would also be compromised, as the Tiburon Ferry buildings, land, and docks could be flooded in the near-term.



Tiburon once served as the southern terminus of the Northwestern Pacific Railroad. Credit: Photographer on San Francisco and North Pacific Railroad Station House-Depot National Register of Historic Places Nomination Form



Tiburon's Main Street commercial buildings date back to the early 1900s, and are adjacent to the ferry terminal. Credit: Marin County CDA

Angel Island

California State Landmark

National Register of Historic Places (Immigration Station)

Vulnerable Resources: Ferry terminal (access, non-historic)

Scenarios: All

Flood Depths: 0- 6'9"+100-year storm surge

Historically, Angel Island was best known for its immigration station, sometimes referred to as the "Ellis Island of the West." From 1910-1940, hundreds of thousands of immigrants, often from China and Japan, were detained on the island,

¹⁵⁰ Arnett, Victoria Mason. 1994. National Register of Historic Places Form - San Francisco and North Pacific Railroad Station House/Depot.

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sometimes for months as part of immigration control. Now, the island is a popular destination with a variety of outdoor recreational activities and interpretation throughout its historical buildings.

Angel Island's historic structures are generally at higher elevations and therefore not vulnerable to sea level rise. However, the Angel Island ferry is vulnerable in the near-term, with flood depths increasing in the medium- and long-term scenarios. If the ferry terminal floods it could cause a reduction or loss in important tourism revenue needed to sustain the historic buildings.

Larkspur

Larkspur Historic Resources Inventory

Vulnerable Resources: 6 homes

Scenarios: All

Flood Depths: 1'1" - 6'8"+100-year storm surge

Primary Building Materials: Wood

Six vulnerable historic homes lie along Boardwalk One, the only remaining boardwalk of four with arks, or small canal homes, accessed by boardwalks above the marshland.

San Rafael

San Rafael Historical/Architectural Survey & Historic Properties List

Vulnerable Resources: 1 Landmark, 1 District, at minimum 2 potentially historic areas, at minimum 4 potentially historic buildings

Scenarios: 2, 3, 4, 5, 6

Flood Depths: 0 to 6'+100-year storm surge

Primary Building Materials: Wood, Brick

San Rafael's exposed historic resources could be vulnerable to both tidal flooding and 100-year storm surge flooding from San Rafael Creek, generally in close proximity to US Highway 101. Resources include the Litchfield Sign (local landmark), the French Quarter, two potentially historic areas, Ritter Street and Gerstle Park (partial), and four potentially historic structures.

China Camp State Park

National Register of Historic Places

Vulnerable Resources: Shrimp Shed and 305' Pier

Scenarios: All

Flood Depths: 0-10'0"+100-year storm surge

Primary Building Materials: Wood

Historic American Landscape Survey: Underway

China Camp was once home to Miwok Indians. The site contains a shellmound from their settlements here. This site is also the only remaining historic Chinese-American shrimp village in the Bay Area. In the late 1800's, China Camp housed around 500 residents, many from Canton, who made a living in shrimp harvesting. Several of the historic structures are intact and a seventy-five acre district encompassing them was added to the National Register of Historic Places in 1979. Finally, a Historic American Landscape Survey is underway to document the site's historic resources.¹⁵¹



Larkspur's Boardwalk #1 with canal homes accessed via boardwalks. Credit: Marin County CDA



San Rafael's French Quarter Historic District. Credit: Marin County CDA

¹⁵¹ Patillo, C. *China Camp HALS*. Last updated July 1, 2012. <http://halsca.blogspot.com/2012/07/china-camp-hals.html>

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Vulnerable structures at China Camp include the wood-framed shrimp shed and 305 foot pier along its waterfront. Flood depths could reach up to 10 feet of tidal water potentially drowning the pier and damaging both resources. The Shrimp Shed currently serves a visitor center with interpretive panels and artifacts educating the public on the early immigrant history, traditional fishing practices and more. These historic artifacts could also be damaged as the building is flooded. Erosion could further exacerbate impacts to the site, damaging cultural landscape features such as the beach itself. Furthermore, North San Pedro Road Camp floods at king tides, compromising public and maintenance access. This would worsen with higher sea levels.



China Camp drying grounds. 1889. Credit: Wikipedia.



King Tide floods N. San Pedro Road in China Camp. Nov. 2015. Credit: Marin County CDA

Hamilton Army Air Field

National Register of Historic Places

Vulnerable Resources: 8 buildings, 1 structure, 1 object

Scenarios: 5, 6

Flood Depths: 2'5"-10'4"+100-year storm surge

Primary Building Materials: Concrete, Stucco

Historic American Building Survey: CA-2398

In the 1930's, the 1,779 acre Hamilton Army Air Field was constructed as headquarters for the First Wing of the Air Force, one of only three such bases in the nation.¹⁵² The site was transferred to the US Navy, Army, and Coast Guard in 1974, and is now part of Novato. The National Register of Historic Places Registration Form identifies 3 areas of the historic district.¹⁵³ Of the three areas, Area C could be subject to average higher high tide flood depths of 2'5" to 10'4" by long-term scenario 5. All ten of its resources could flood, including:

- Double hangars- 3 identical H-shaped buildings with a central shop and hangar on either end,
- Air Corps shops and hangar #9: Identical exterior to other hangar buildings, with half of its interior designed as a shop,
- Flagpole- 75 foot metal flagpole with historic plaque,
- Headquarters building- T-shaped with central two-story section and one-story wings,
- Non-Commissioned Officers' Barracks- 3 H-shaped 3-story buildings, and
- Electrical transformer vault.

Additionally, the Hamilton Field History Museum housed in the historic 1934 firehouse directly adjacent to Area C is also exposed by long-term scenario 5. The museum opened in 2010 to collect, preserve, exhibit, and interpret Hamilton field and Hamilton air force base history.

Table 47 highlights the vulnerable cultural resource assets and ranks them by onset and flood depth at MHHW. In addition to these sites, a few others could be vulnerable under long-term scenario 6 sea level rise conditions with a 100-year storm surge. These are:

¹⁵² Maniery, M.L., and C.L. Baker. 1998. National Register of Historic Places Registration Form – Hamilton army Air Field Discontiguous Historic District.

¹⁵³ Ibid.

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- Sausalito, two landmark buildings,
- Belvedere Presbyterian Church/Belvedere City Hall/Community Center, and
- Tiburon Railroad Station House-Depot.



Hamilton Field's Headquarters now serves as the Novato Arts Center. Credit: Marin County CDA

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Table 47. Vulnerable Cultural Resource Assets Ranked by Onset and Flooding at MHHW

Location	Asset	Near-term	Medium-term	Long-term
		Scenario 1	Scenario 3	Scenario 5
Confidential locations	Archaeological sites	3 sites	5 sites	14 sites @ 1'11"-10'8"
Belvedere	Four Waterfront Properties along Beach Road	6"	1'3"	3'0"-3'2"
Sausalito	Ark Row District	3'6"-6'2"	3'1"-6'10"	6'1"-9'5"
Tiburon	Main Street	2 buildings @ 7'3"-7'4'	6 buildings @ 6'8"-7'11"	11 buildings @ 1'4"-8'6"
Pt. San Pedro	China Camp Historic District*	0-7'3"	0-7'8"	0-10'0"
Larkspur	Boardwalk One	1'1"-3'1"	1'10"-3'10"	4'7"-6'8"
Fort Baker*	National Recreation Area	0-4'5"	0'-5'2"	0-7'10"
Angel Island	Angel Island* Ferry Terminal	0-3"	0-11"	0-6'9"
Sausalito	Downtown Historic District*	4 sites	4 sites	4 sites @ 0-9'4" (22 sites w/ storm surge)
San Rafael	The Litchfield Sign	w/ storm surge	3'3"	6'0"
San Rafael	The French Quarter District			2'2"-2'4"
San Rafael	2 potentially historic areas and at minimum 4 additional potentially historic structures			0-2'11"
Sausalito	Noteworthy structures outside the Downtown Historic District			2 sites @ 1'4"-6'1" (8 sites w/ storm surge)
Sausalito	Marinship potential resources	1 resource		2 resources @ 2'1"-2'8" (7 resources w/ storm surge)
Novato	Hamilton Army Air Field* Area C			2'5"-0'4"

*indicates listing on National Register of Historic Places

Source: MarinMap; CoSMoS, Marin County CDA; City of Sausalito, Historic Resource Inventory Listing, Marinship Historic Context Statement; Local Historic Inventory for Downtown Tiburon; China Camp National Register of Historic Places Inventory – Nomination Form; Update of the Historic Resources Inventory (Larkspur); Fort Baker, Barry and Cronkhite National Register of Historic Places Inventory – Nomination Form; Sausalito Historic District National Register of Historic Places Inventory – Nomination Form; City of Sausalito, Historic Resource Inventory Listing; Historic Properties List (San Rafael); San Rafael Historical/Architectural Survey; Marinship Historic Context Statement; National Register of Historic Places Registration Form – Hamilton Army Air Field Discontiguous Historic District; City of Belvedere General Plan Update – Cultural Resources.

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Other Considerations

Economic

Historic preservation has proven to be an effective tool for small business sustainability, community development, renewal, and revitalization, heritage tourism development, and more.¹⁵⁴ Several of Marin's vulnerable historical areas house important local businesses. Loss or deterioration of these resources could have negative economic impacts. Additionally, Marin's historic sites contribute to the county's unique charm and character, adding to the appeal for tourism, and visitor spending, sales tax, and transient occupancy tax. In some cases, historic sites adjacent to the Bay may serve as shoreline armoring or buffer storm impacts helping to protect lands and properties inland, thus helping to prolong their continued economic use.

Environmental

In addition to providing valuable information on cultural history, archaeological resources can be important information sources on natural history. Through analysis of elements such as pollen, seeds, shells, and bones, archaeological data can reveal the plants and animals that thrived during past climactic periods (e.g., the mid Holocene) with land and water temperatures comparable to potential future conditions with climate changes, including secondary impacts, such as, increased ocean acidification.¹⁵⁵ Such data could be applied for future ecosystem restoration and management plans.

In addition to allowing communities to remain intact, continued use of older buildings has environmental benefits. Retrofitting existing buildings through elevation and flood proofing can extend their lives in the face of SLR and increased storms, thus avoiding the immediate need for new construction. Building reuse is almost always less environmentally taxing than new construction, and it can take 10 to 80 years for a new building that is 30% more energy efficient than an average performing existing building to overcome negative climate impacts from construction.¹⁵⁶

¹⁵⁴ Rypkema, Donovan D., 2005. The Economics of Preservation: A Community Leader's Guide.

¹⁵⁵ Newland, Michael (Sonoma State Anthropological Studies Center). 2015. Personal Communications

¹⁵⁶ National Trust for Historic Preservation. 2011. The Greenest Building: Quantifying the Environmental Value of Building Reuse.

Social Equity

In addition to losing valuable historic information about the region, the loss of archaeological sites can have significant sense of place impacts, particularly for Native American's who consider the sites sacred, While documenting the sites can help preserve some of the valuable historical information, the loss of these irreplaceable resources could represent an unprecedented loss to history and culture with no established processes to mitigate their disappearance.

Social equity is important in the field of historic preservation. Both China Camp and Angel Island hold stories of historically marginalized Asian immigrants. Preservation of these irreplaceable sites is important to ensure they remain in the collective memory and contribute to a more inclusive understanding of local and national history.

Several of the public historic sites offer educational experiences that can be enjoyed by many people regardless of socioeconomic circumstances and age. China Camp, the San Francisco Bay Model, and Fort Baker can all be accessed for relatively low costs adding to their appeal for families with children. These costs could increase if the sites have to undergo improvements to prevent or recover from flooding.

Management

The loss of archaeological sites can present management challenges including the need for increased documentation and protection of sites, particularly those of high intrinsic value. Close coordination with Native American groups will be critical to ensure that adaptation strategies protect vulnerable archaeological sites.

Little guidance exists to inform the challenge of adapting historic sites in the face of sea level rise. Elevation may be structurally feasible, but could have negative integrity impacts. Levees and seawalls could have negative impacts to the cultural landscape. Relocation could remove sites from the historic districts or contexts. Such strategies may therefore not be allowed under current local design review guidelines.

Section 106 of the National Historic Preservation Act of 1966 requires federal agencies to take into account project impacts on historic properties. This includes projects located on federal properties or using federal funding. Under Section 106, any

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alterations would need to be consistent with the Secretary of the Interior's Standards for the Treatment of Historic Properties. Adaptation strategies that have negative impacts on historic integrity, introduce incompatible elements, change the use or setting, or relocate landward are amongst the types of projects that would likely be deemed adverse effects.¹⁵⁷ Neglect and deterioration can also be adverse effects¹⁵⁸ that merit consideration as sea level rise and increased storms could exacerbate the deterioration of historic properties if not properly managed for.

¹⁵⁷ Advisory Council on Historic Preservation. 2015. Protecting Historic Properties: A Citizen's Guide to Section 106 Review.

¹⁵⁸ Ibid.

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Map 44: Northern Study Area Vulnerable Cultural Resource Assets

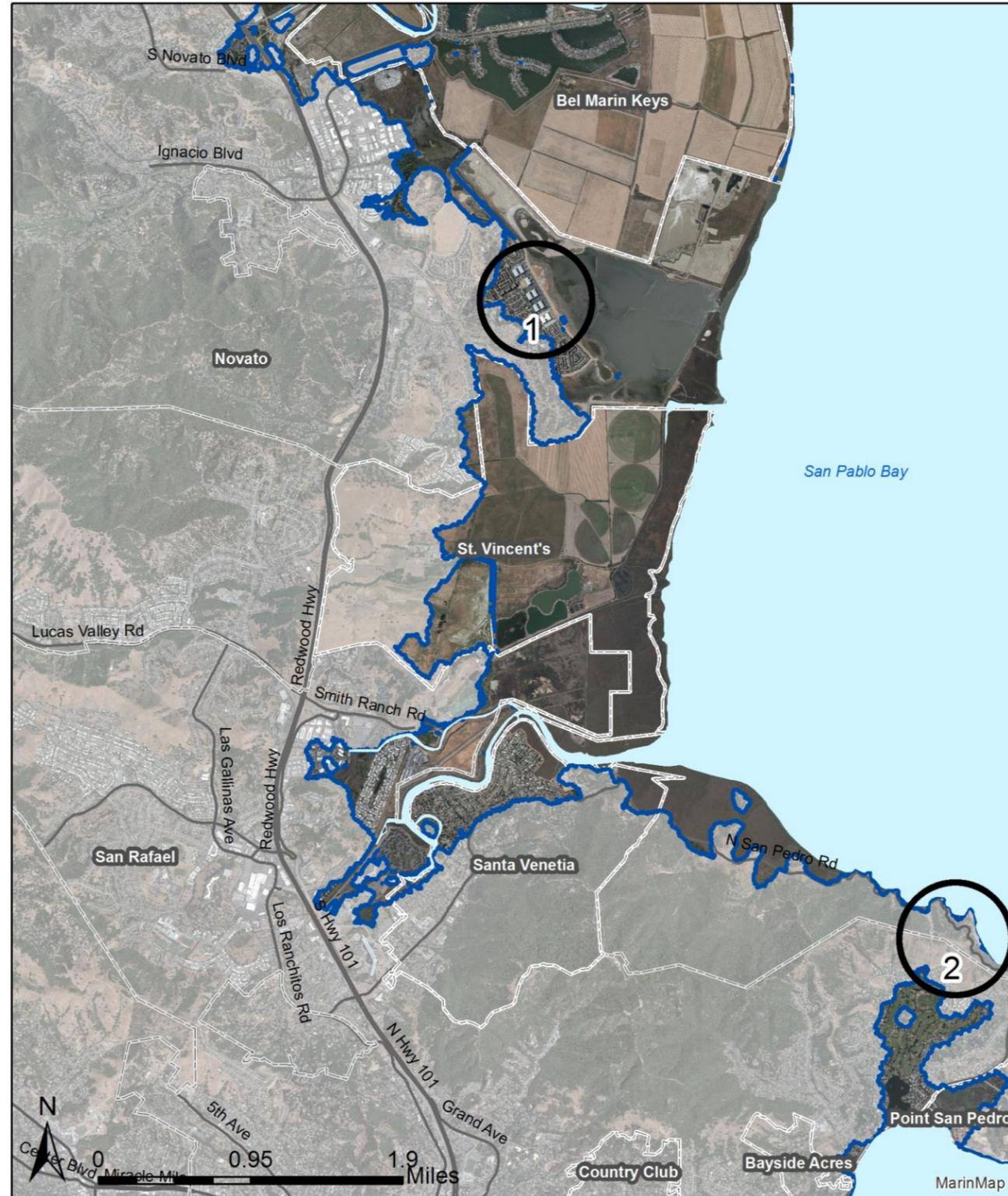
Vulnerable Historic Buildings

- Scen. 1: 10" Sea Level Rise (SLR)
- Scen. 2: 10" SLR+Storm Surge
- Scen. 3: 20" Sea Level Rise
- Scen. 4: 20" SLR+Storm Surge
- Scen. 5: 60" Sea Level Rise
- Scen. 6: 60" SLR+Storm Surge

Location Indicators

- Municipality
- Major Road
- ~ Inland Extent: Sea Level @ 60"+100-year Storm

Archaeological resources may be present.
 Source: MarinMap; CoSMoS, Marin County CDA; China Camp National Register of Historic Places Inventory – Nomination Form; National Register of Historic Places Registration Form – Hamilton Army Air Field Discontiguous Historic District;

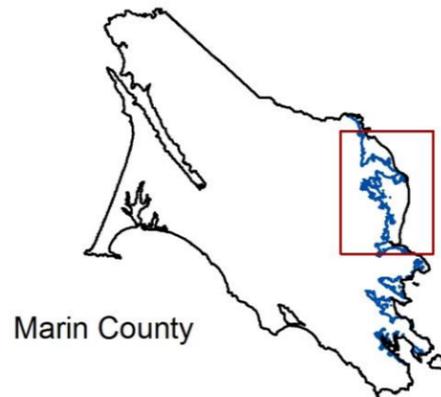


1: Hamilton Army Air Field



2: China Camp State Park

Disclaimer: Vulnerability Assessment maps, tables, etc. can be used as a resource to help identify potential hazardous areas and vulnerable assets. Marin County, and data providers here in, make no warranties of the accuracy or completeness of maps and data. Maps are representational and subject to future revision. Local site conditions must be examined. Commercial use is prohibited.



Date:
2/17/2017



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Map 45: Southern Study Area Vulnerable Cultural Resource Asset

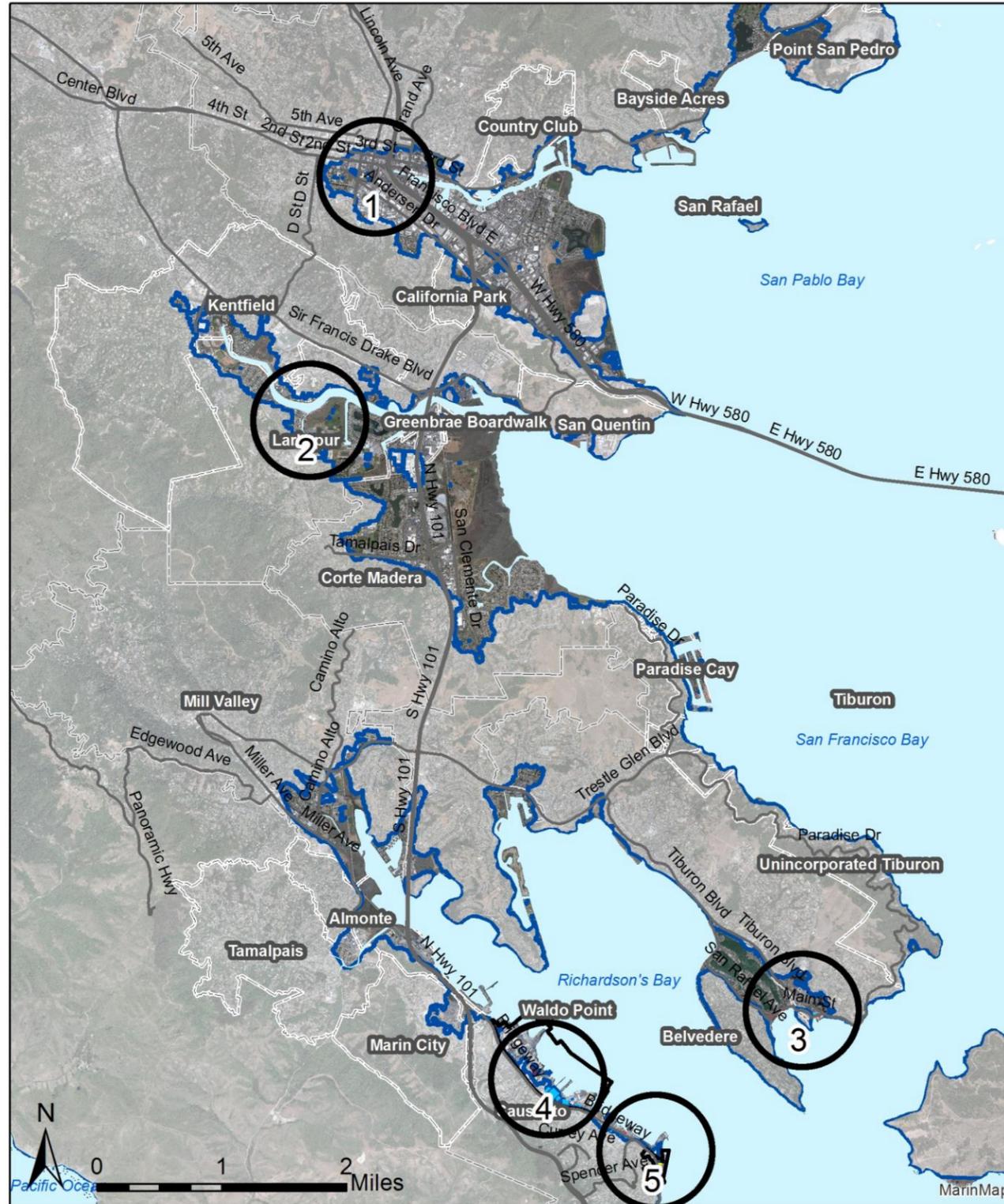
Vulnerable Historic Buildings

- Scen. 1: 10" Sea Level Rise (SLR)
- Scen. 2: 10" SLR+Storm Surge
- Scen. 3: 20" Sea Level Rise
- Scen. 4: 20" SLR+Storm Surge
- Scen. 5: 60" Sea Level Rise
- Scen. 6: 60" SLR+Storm Surge

Location Indicators

- Municipality
- Major Road
- ~ Inland Extent: Sea Level @ 60"+100-year Storm

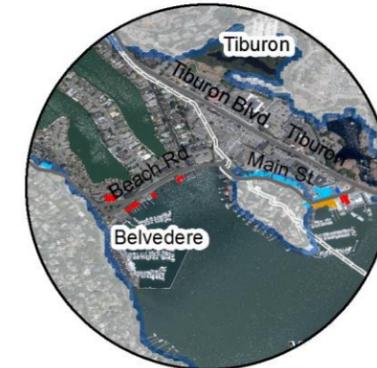
Archaeological resources may be present.
 Source: MarinMap; CoSMoS, Marin County CDA; City of Sausalito, Historic Resource Inventory Listing, Marinship Historic Context Statement; Local Historic Inventory for Downtown Tiburon; Update of the Historic Resources Inventory (Larkspur); Sausalito Historic District National Register of Historic Places Inventory – Nomination Form; City of Sausalito, Historic Resource Inventory Listing; Historic Properties List (San Rafael); San Rafael Historical/Architectural Survey; Marinship Historic Context Statement; City of Belvedere General Plan Update – Cultural Resources



1: San Rafael



2: Larkspur



3: Tiburon-Belvedere

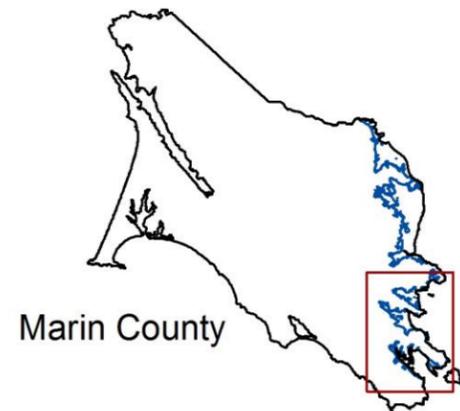


4: Marinship



5: Sausalito Downtown Historic District

Disclaimer: Vulnerability Assessment maps, tables, etc. can be used as a resource to help identify potential hazardous areas and vulnerable assets. Marin County, and data providers here in, make no warranties of the accuracy or completeness of maps and data. Maps are representational and subject to future revision. Local site conditions must be examined. Commercial use is prohibited.



Marin County



Date:
2/17/2017

