

Midcoast Shoreline Erosion & Armoring

Midcoast Community Council Study Session
May 10, 2023, Lisa Ketcham



Steve King

Moss Beach, view from Arbor Ln, Jan 2023

California Coastal Act

effective date Feb 1, 1977

Protect natural shorelines – limit use of shoreline armoring

Limits on use of shoreline armoring (Section 30235, in part)

Revetments, breakwaters, groins, harbor channels, seawalls, cliff retaining walls, and other such construction that alters natural shoreline processes shall be permitted when required to serve coastal-dependent uses or to protect existing structures or public beaches in danger from erosion, and when designed to eliminate or mitigate adverse impacts on local shoreline sand supply.

Minimize risk from coastal hazards when approving new development

New development shall: (Section 30253, in part)

- Minimize risks to life and property in areas of high geologic, flood, and fire hazard.
- Assure stability and structural integrity, and neither create nor contribute significantly to erosion, geologic instability, or destruction of the site or surrounding area or in any way require the construction of protective devices that would substantially alter natural landforms along bluffs and cliffs.

Public Trust Doctrine

In California, the state owns the beach seaward of the mean high tide line. This may fluctuate as sand is moved on and off shore with the seasons. It is also moving inland due to sea level rise.

Impacts of shoreline armoring

- Degradation of natural shoreline scenic resources – much greater impact to general public on the beach than to the private property owner above.
- Placement loss – portion of beach covered by new armoring -- greatest for riprap which requires slope of 1.5:1 or 2:1 for stability, e.g. 20-ft high could extend out 40 feet onto beach for length of wall.
- Reduced beach access, lateral or vertical
- Reduced sand supply – from natural process of eroding cliffs
- Passive erosion – artificial headland forms with loss of beach in front of revetment as adjacent natural shoreline migrates inland over long term
- Active erosion – accelerated erosion due to wave interaction with armoring structures (south of harbor jetty along Surfers' Beach)

Montara State Beach



Aesthetics (visual impacts)



Natural cliff face at Montara State Beach

Imported boulders & concrete slurry contrast harshly with surrounding natural landscape and scar the view. 4



Montara Beach
1983 El Niño storms

Only 4 years after construction,
emergency armoring installed on
the public beach to protect
the Chart House restaurant.



Early Permitting: Coastal Development Permit (CDP)

1977: Coastal Commission approved CDP for redevelopment of blufftop 50's motel/restaurant into Chart House restaurant.

Coastal Commission had CDP jurisdiction from 1977 Coastal Act effective date until 1980 County Local Coastal Program (LCP) certified.



1979: newly constructed Chart House restaurant



2004 CA Coastal Records Project

1984: County approved after-the-fact CDP to place riprap on 460 linear feet of ocean bluff, & install storm drainage in the parking lots.

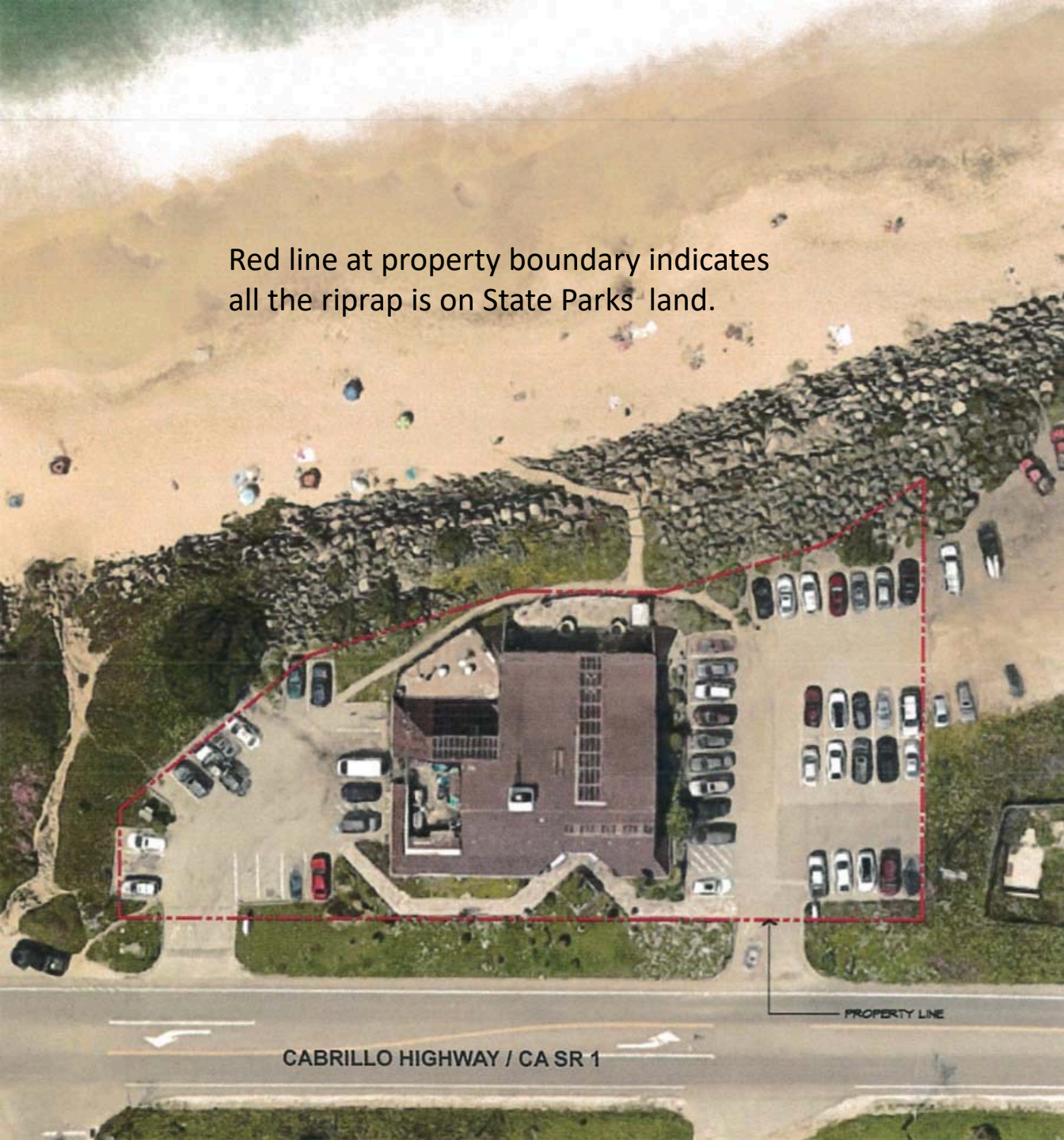
Maintenance & Useful Life:

Steep wall of boulders, 40 years old, undermined and hazardous.



2010 report “Poor Drainage and Rip Rap Erosion” by BAGG Engineers:

- Riprap was not keyed into the firm ground underlying the sand.
- Bottom 6 ft of the riprap has been grouted with cement (without permit).
- Parking lot drains discharge behind the riprap, causing undermining.
- Report recommends rerouting drainage pipes and repairing the riprap sea wall.



Red line at property boundary indicates all the riprap is on State Parks land.

2017 County Use Permit Amendment to legalize unpermitted development includes Condition of Approval to repair the riprap – to coordinate the plan with State Parks & CCC, and submit the plan within 1 year.

Plan for county-mandated riprap repairs was due Oct 2018.

CABRILLO HIGHWAY / CA SR 1

PROPERTY LINE

Riprap repairs should include removal of view-blocking boulders on the bluff top. (MCC 9/26/17)

Riprap extends onto top of bluff, far beyond where needed for erosion protection, blocking public access and views. Plan cross-sections of the riprap are conceptual, showing an even, gentle slope, but in reality the slope is much steeper along the bottom, and more level along the top.



Red line marks the upper reach of riprap in front of the restaurant, and the dirt State Parks lot, which have no view obstruction.



View of beach from parking lot blocked by boulders

Excess alien boulders strewn over the blufftop, block access and mar the mountain view.

Moss Beach – Reef Point Rd

Pre-Coastal Act armoring is grandfathered (without CDP), but modification or repair requires a CDP.

60's-era coastal armoring has required extensive repairs over the years, under County permits.



Reaction to the natural process of coastal bluff erosion has been piecemeal emergency armoring to protect development, mostly without regard to aesthetics, coastal access, or long-term area shoreline dynamics.

Fitzgerald Marine Reserve (FMR) Sunshine Valley (Dean Creek) to San Vicente Creek



Prior to 1983, public beach access existed both north & south of the FMR access ramp.

County 1980's armoring permit approvals noted the wide beach and that lateral access would not be blocked by riprap placed on the public beach to protect 3 houses: 97 & 101 Beach, and 201 Nevada



199 Arbor Ln, 2018 CDP:
no future armoring

263 Nevada, 2012 CDP:
no future armoring

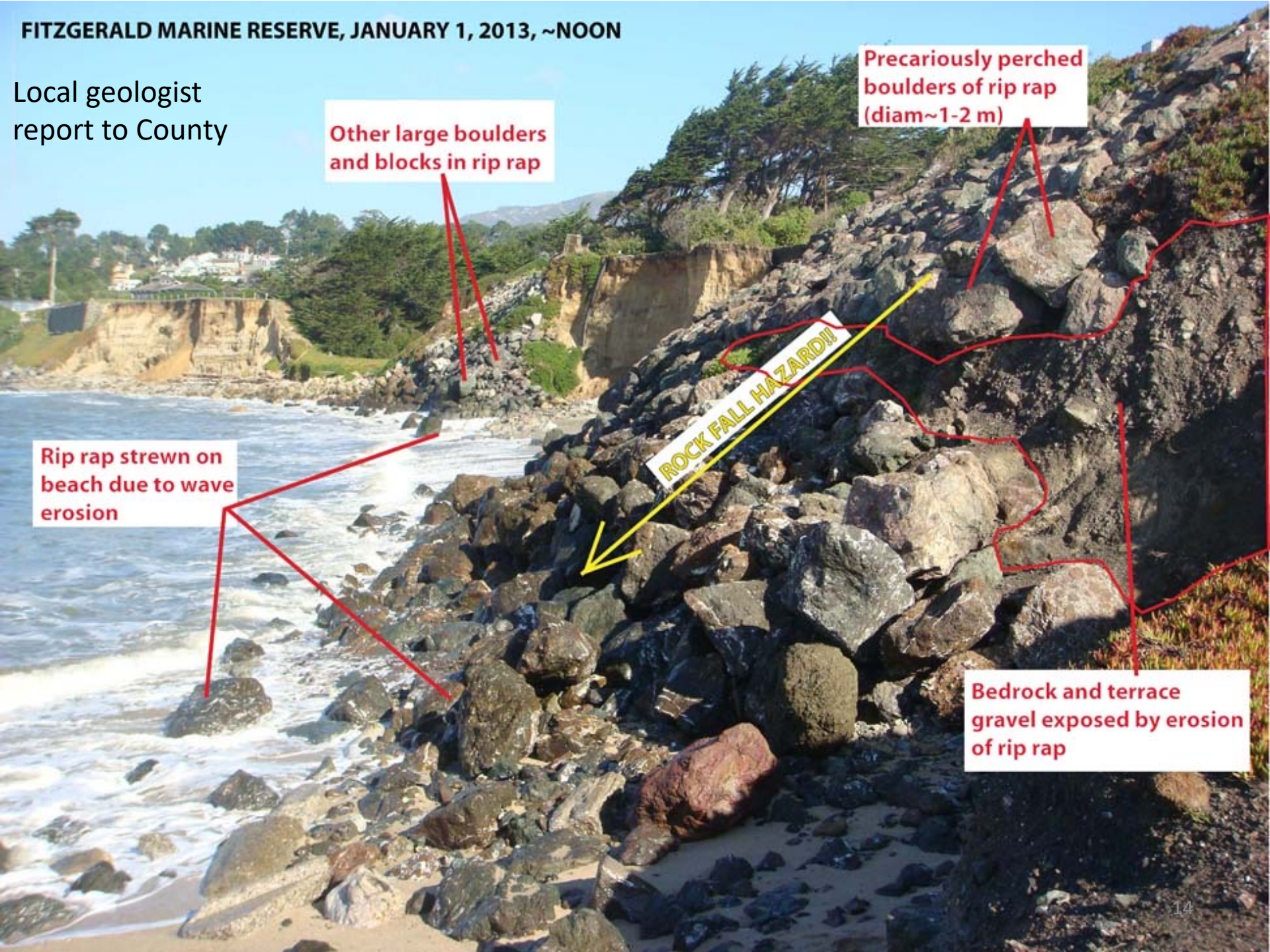
Managed Retreat

Threatened by bluff erosion in 2002, instead of armoring the cliff, the historic house at 100 Beach St was moved inland onto the neighboring parcel, 263 Nevada.

In 2012 on appeal of CDP for expansion of the relocated house, CCC prohibited future armoring.



Local geologist
report to County



Other large boulders
and blocks in rip rap

Precariously perched
boulders of rip rap
(diam~1-2 m)

ROCK FALL HAZARD!!

Rip rap strewn on
beach due to wave
erosion

Bedrock and terrace
gravel exposed by erosion
of rip rap



Coastal armoring is a government-sanctioned taking from the public.

Even at low tide, public access along the shoreline is difficult and hazardous due to deteriorating riprap with precariously perched boulders overhead and strewn over the beach.

New sign was added in response to geologist's 2013 report of rock fall hazard.

Peninsulas of rock expand across the beach at FMR as riprap deteriorates and surrounding cliffs erode naturally, nourishing the beach.

May 2023



Even at low tide, shoreline access is severely hindered by armoring rocks spread uselessly, far across the beach, blocking access to and from Sunshine Valley, also part of FMR.

CDP exemption approved by staff March 2023 for major remodel of 97 Beach St, but no discussion of deteriorating riprap or opportunity for managed retreat on the large lot as several more feet of yard slumped downhill in winter storms.



FMR Moss Beach Reef Overlook



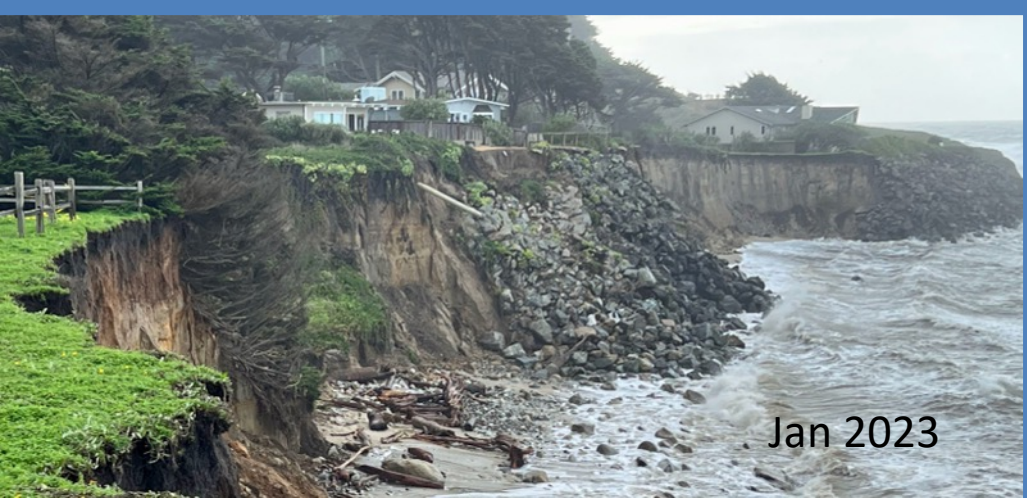
-- promontory constructed of rock and concrete rubble on the shoreline at San Vicente Creek
-- before the Marine Reserve was established in 1969.

2016 FMR Master Plan Assessment calls for managed retreat as the overlook degrades.

2022 shoreline, Sunshine Valley to San Vicente Creek



Cliff erosion is cutting in behind the riprap.
Red arrows at 97 Beach and 201 Nevada show where those houses on large lots could be moved away from the eroding shoreline.



Jan 2023

County Permit Conditions of Approval to maintain the riprap have never been enforced.



Seal Cove beach
south of FMR staircase

House at 96 Terrace,
destroyed by fire in 2018
(20' above sea level per contour map)

New owners plan to re-build in
same location with CDP exemption
(SMC Zoning Regs Section 6328.5)



Seaward extent & level of house
footprint.

Status of armoring boulders
seen here on beach
is being investigated.

Seal Cove neighborhood west of Ocean Blvd

1979 CA Coastal Records Project



All 4 houses seen here in 1979 west of Ocean Blvd have been relocated or demolished.

Ocean Blvd between the Distillery and San Lucas was permanently closed by 2011 due to ongoing deep landslide, followed by paving of some new inland streets for access.

To the north and south of Seal Cove neighborhood, the cliffs at FMR County Park, which extends south to Pillar Point, can erode naturally with gradual retreat of any trails and fencing. 21

Deed-restricted conditions of approval prohibiting future armoring
added to shoreline Coastal Development Permits
per expectation of the Coastal Commission
(in Moss Beach & Princeton)

- Applicant assumption of Risk, Responsibility, Waiver of Liability, and Indemnity Agreement regarding coastal hazards.
- Shoreline armoring prohibited now or in the future.
- Applicant remove/relocate development when unsafe for use without shoreline protective device. Immediately remove & dispose of development debris that falls from bluff onto beach or coastal waters.
- Recorded Deed Restriction imposing these permit conditions.
- Full disclosure to potential buyers.

Coastal Commission on appeal:

1999: Vassar 101

2012: Nevada 263

2014: Princeton 354 & 358

2020: Arbor Ln 199*

County CDP:

2019: Vallemar Bluff 4 houses

2021: Ocean Bl 989

2022: Ocean Bl at Precita

*Added by CCC on appeal in 2020:

- Prohibit deep piers & tie-back foundation which itself constitutes a form of shoreline armoring.
- Apply prohibitions to adjacent steep banks of creeks/ravines >10 ft high which fall under LCP definition of coastal bluff.

Additional Conditions of Approval

Vallemar Bluff, 2019

preserve public coastal access & sensitive habitat:

Four houses approved on 2.5 acres, with conservation easement over the rare coastal prairie habitat, and provision for the public trail to retreat inland when required by bluff erosion.



Ocean Blvd, 2022

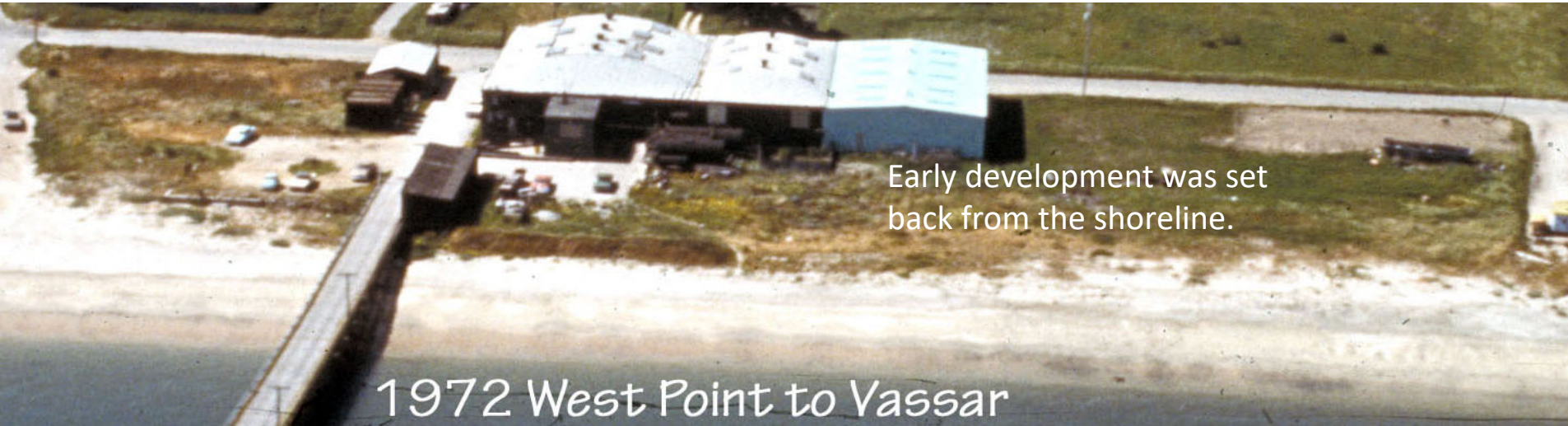
mid-block development (Precita/Bernal)

County not required to maintain access or utility infrastructure when coastal hazards eliminate access to the site due to degradation and eventual failure of Ocean Boulevard as a viable roadway.

Princeton Shoreline - western-most block

Plan Princeton (incomplete planning effort 2013-2015)
expected to include Princeton Shoreline Management Plan

<https://midcoastcommunitycouncil.org/princeton-shoreline>



remains of Romeo Pier

Princeton Shoreline at Romeo Pier

1997: County ZHO approved 7 “marine warehouses” w/caretaker units on Ocean Blvd, a paper street on the beach. Substandard 25’W lots, all previously under same ownership, now luxury waterfront homes, not a coastal-dependent use



Emergency armoring added before construction of last building even complete.

1999: an 8th building in this waterfront row, at 101 Vassar, had CDP appealed to CCC and condition added: Deed restricted prohibition of shoreline armoring – a first for the Midcoast.



Princeton shoreline



Lateral beach access at foot of Romeo Pier blocked in 2009 by illegally-placed riprap



... trucked down the street from 380 Princeton Av boulder stockpiles stored there since CCC riprap enforcement action in 2008.

Long-Range Planning -- State & others

<https://midcoastcommunitycouncil.org/ocean-shoreline>

2015 Coastal Regional Sediment (Sand) Management Plan for Santa Cruz Littoral Cell
(Pillar Point to Moss Landing)

2018 Ocean Protection Council's State of California Sea-Level Rise Guidance Update

CA Coastal Commission Guidance on Sea Level Rise Planning

<https://www.coastal.ca.gov/climate/slr/>

2018 Sea Level Rise Policy Guidance

2018 Residential Adaptation Guidance

2021 Critical Infrastructure Guidance

2023 Public Trust Guiding Principles and Action Plan

USGS Coastal Storm Modeling System (CoSMoS) science-based online mapping tools to help coastal planners anticipate local impacts from SLR and storms.

2020 Half Moon Bay LCP Land Use Plan update

<https://www.half-moon-bay.ca.us/154/Local-Coastal-Program-Land-Use-Plan>

- Compare the HMB Ch 7 Shoreline Hazard Policies with County LCP policies in Ch. 9 Hazards Component (not updated and not yet in Long-Range Planning queue).
- HMB is particularly appropriate resource for shoreline hazard policies due to proximity and overlap with unincorporated Midcoast where HMB city limit cherry stem extends along Mirada Rd and Surfers' Beach.

Long-Range Planning – County

<https://midcoastcommunitycouncil.org/ocean-shoreline>

Plan Princeton 2013-2015, then dormant, still lacking shoreline management plan

2016 Adaptation Design Charrette for Mirada Rd area of Miramar:

Explored scenario for managed retreat to Alameda Av

2018 SMC Sea Level Rise Vulnerability Assessment: Asset Vulnerability profiles for:

FMR -- Mirada Rd -- Surfers' Beach -- HMB landfill -- SAM sewer plant

2021 Local Hazard Mitigation Plan:

- “Mitigating the impacts from sea-level rise will take resources and tough land use decisions, starting immediately.”
- “County should consider adoption of higher regulatory standards to mitigate impacts of sea-level rise on redevelopment.”

LCP policies need updating to address sea level rise (such as HMB has done)

- CCC recommends minimum 100-yr time frame for residential development when evaluating coastal hazards including the effects of SLR. The County is still looking at only a 50-yr time frame.
- County plans to wait beyond 2024 for completion of County-wide Safety Element update and Princeton Shoreline Management Plan before beginning this LCP update.

Pillar Point Harbor breakwater and Surfers' Beach

Issues:

- erosion, deteriorating riprap
- threatened critical infrastructure
- sediment buildup in harbor

Government agencies:

- Harbor District
- OneShoreline
- Caltrans
- Coastal Commission
- Army Corps of Engineers
- San Mateo County
- City of Half Moon Bay
- National Marine Sanctuaries

OneShoreline

(San Mateo County Flood and Sea Level Rise Resiliency District)

<https://onshoreline.org/projects/pacific-coastline-projects-in-development-with-other-partners/>

Pillar Point Harbor Shoreline Management Study

Pillar Point to Miramar

May 17, 1pm, Harbor Commission meeting:

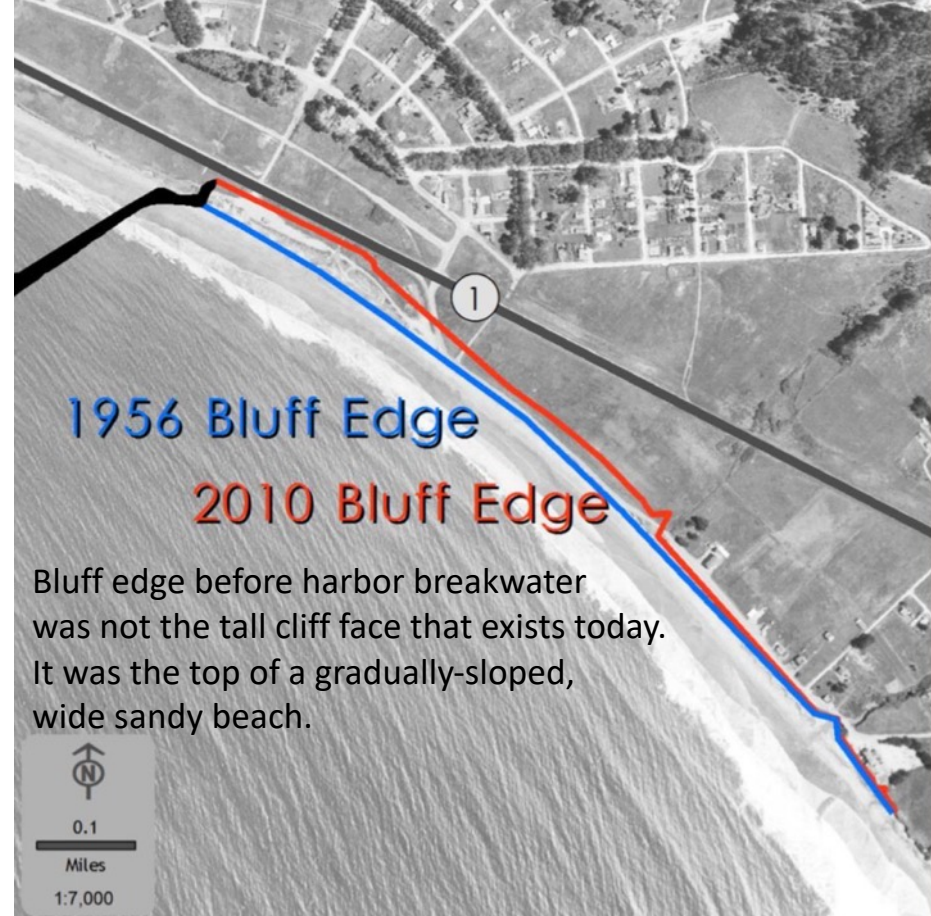
Bob Battalio of ESA, consultant of OneShoreline, will present the results of their review of existing studies of the Harbor breakwater and Half Moon Bay shoreline and their recommendations to address sea level rise.

Surfers' Beach Reports & Projects

<http://www.midcoastcommunitycouncil.org/surfers-beach/>

US Army Corps of Engineers:

- 2009 report determined that construction of the harbor breakwater 1959-61 dramatically increased the rate of erosion south of the jetty to Medio Creek.
- 2016 report determined the preferred alternative to address the issue was to move 150,000 cy of harbor dredge material to Surfers' Beach and southward to the Miramar revetment, however no federally-funded Army Corps project was recommended due to inadequate cost/benefit ratio.



Caltrans:

2016 project (original CDP 1998, as amended 2015): 10-yr interim (renewable) permit amendment for 175-ft armoring extension & beach-access stairway to allow time to implement a long-term solution.

SMC Harbor District:

2015 initiated Surfers' Beach Pilot Restoration Project: transfer up to 100K cy harbor dredge material to beach south of jetty. If follow-up 2-year monitoring program finds that project is effective and does not cause unacceptable environmental impacts, then a larger beach nourishment project would be pursued in future.



1956
pre-breakwater

Mirada Road

1956



Coronado

1972

Mirada Rd north of Magellan was abandoned to erosion in 1965.



Magellan

CA Coastal Records Project

Miramar

In Jan 2023 storm
some restaurant front windows
were broken out by storm waves.

Waves overtop Mirada Rd revetment
2016



Jack Sutton
Wildbayarea.com



1930's Mirada Rd in front of Miramar Beach
Restaurant, with perpendicular parking
west of the road and direct access
to the wide gently-sloping beach.

Mirada Rd revetment created a fixed back beach -- forming a new headland jutting out over the beach as Mirada Surf bluffs retreat naturally.

New armoring rocks have been privately placed inland along the northern edge of the expanding peninsula where the beach now ends.





CA Coastal Records Project

Options for managed retreat become increasingly difficult as infill development continues.

Recommended Near-Term County Actions (proposed)

1. Update County planning policies and regulations for reviewing new development and redevelopment subject to coastal hazards to reflect the latest science-based guidance from the Coastal Commission.
2. When approving new development or redevelopment, use as broad interpretation of existing policies and regulations as possible for best ability to protect natural shorelines and locate development away from coastal hazards.
3. Require that existing permitted coastal armoring of private property be maintained such that it does not become a public safety hazard due to rocks or debris fall from above, or increase natural shoreline and public access impacts by expanding beyond its original footprint such as when riprap is moved out over the beach by wave action.
4. A shoreline plan is needed for FMR segment Sunshine Valley to San Vicente Creek. (This is specifically in addition to the already identified sub-regional segments needed for Princeton shoreline and Mirada Road, and the long-term plan for Hwy 1 at Surfers' Beach.)