

US EPA ARCHIVE DOCUMENT

Carmel River Watershed: Water Supply Perspective

A presentation for the

**Western States Source Water and
Ground Water Protection Forum**

Tuesday, May 5, 2009

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Preamble

Ground Water vs. Groundwater

- That is not an earthquake you felt, it was the USGS changing its longstanding policy on the two-word vs. one-word spelling.
- On March 26, 2009, USGS Tech Memo 2009.03 issued, reversing Tech Memo 75.03, and the 35-year old policy on the two-word spelling.
- Change becomes effective on August 1, 2009
- Additional information at <http://water.usgs.gov/admin/memo/GW/gw09.03.html>

Topics

Overview

- Monterey Peninsula setting
- Water supply sources
- Historical water supply development

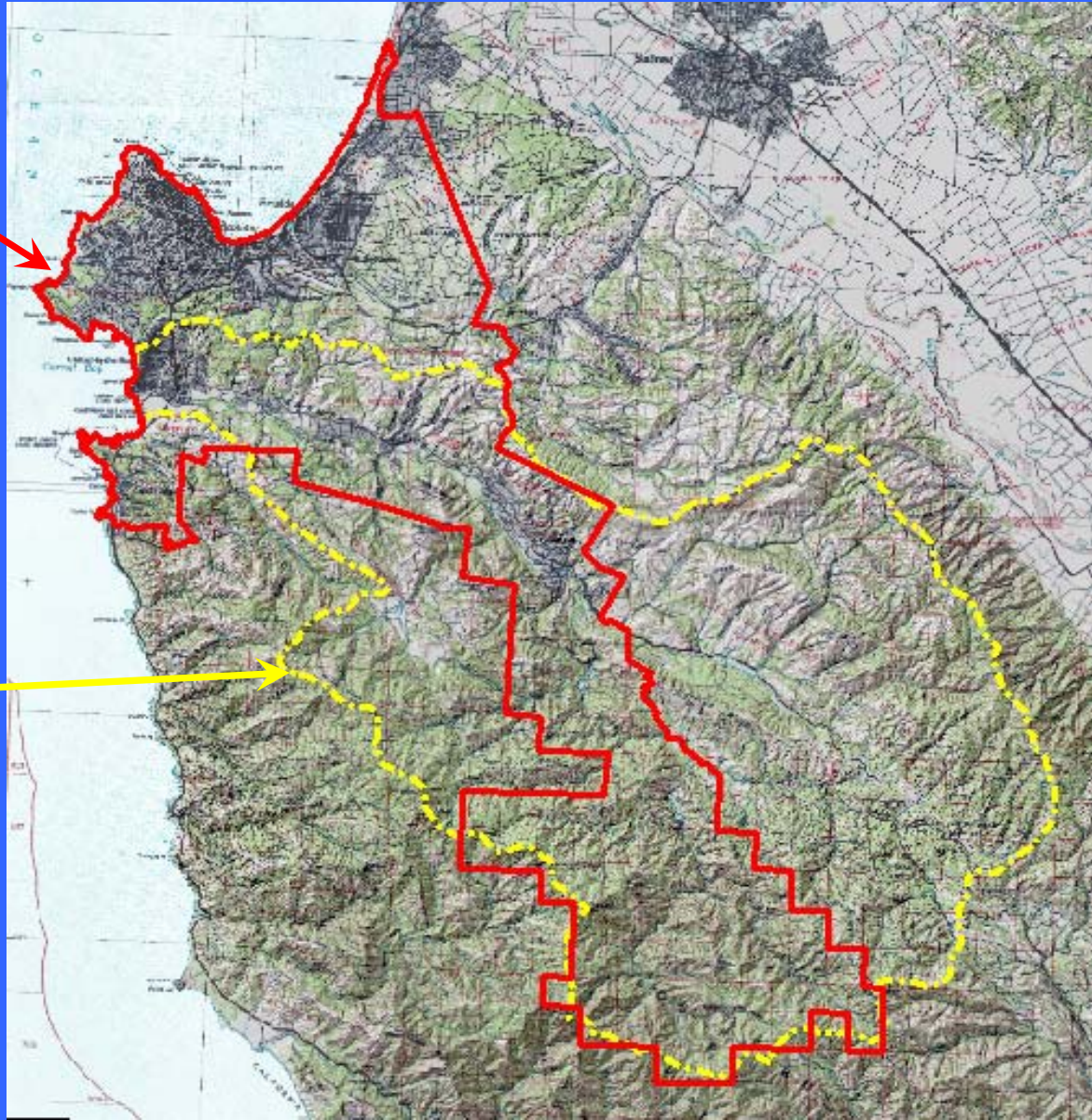
Issues, Constraints, Opportunities

- Water extractions
- Riparian vegetation, channel-bank stability
- Endangered Species Act
- Carmel River Dams: sedimentation, safety
- 2008 watershed fire
- Lagoon / wetland protection and enhancement
- Water supply planning

**MPWMD
Boundary**



**Carmel
River
Watershed
Boundary**



Monterey Peninsula Water Resource System



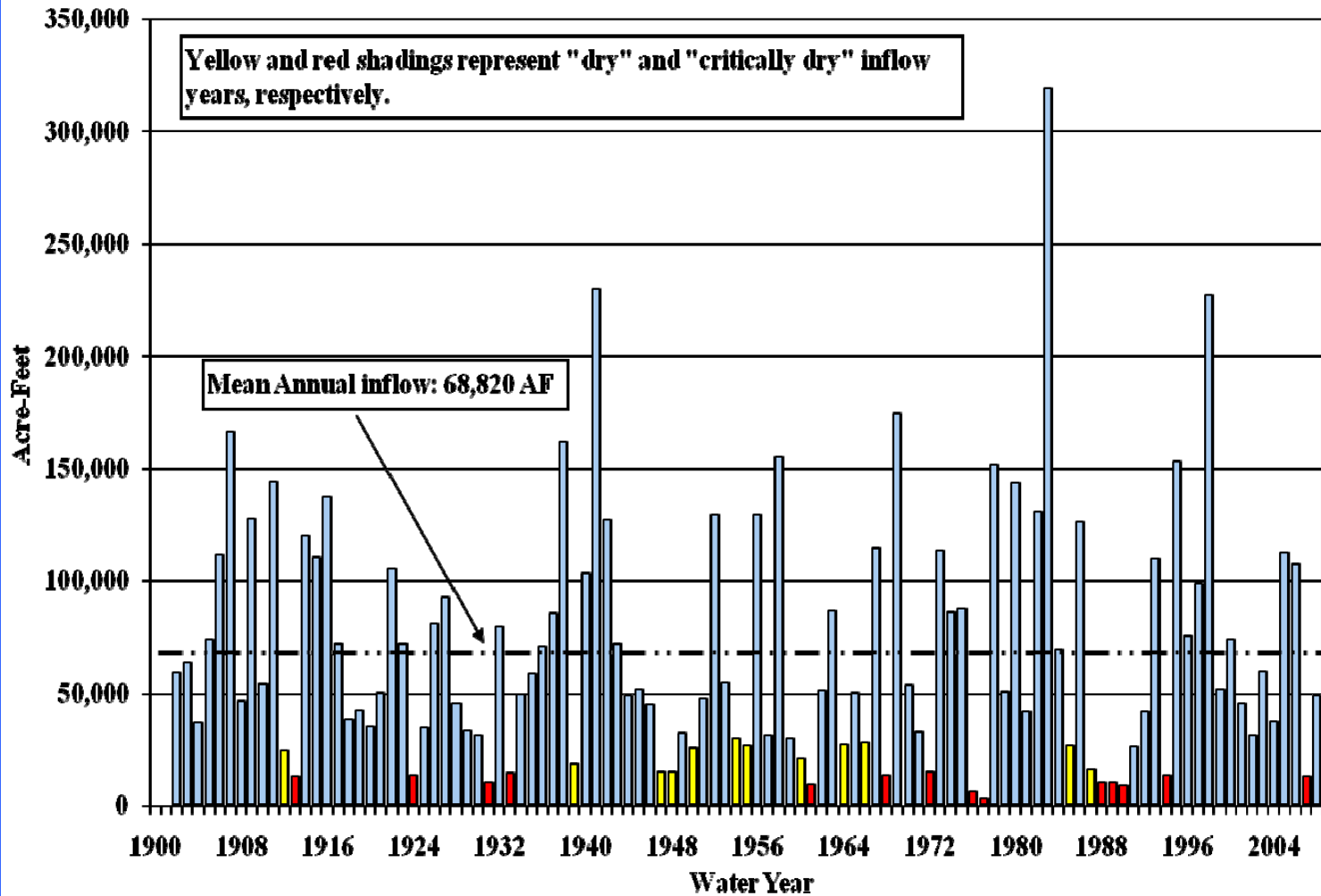
Carmel River Watershed - Physical Features

- **Area:** 255 square miles (163,000 acres)
- **River length:** 36 miles of main stem
- **Upper 20 river miles:** steep canyons, relatively undeveloped, headwaters in Ventana Wilderness Area
- **Lower 16 river miles:** alluvial valley floor, moderately to densely developed
- **River mouth:** Large lagoon and wetland (100 acres)

Rainfall in the basin

- Rainfall amounts vary significantly geographically and seasonally
 - annual rainfall at San Clemente Dam ranges from <3 inches to >46 inches
 - annual rainfall in the basin ranges from <15 inches at the coast to more than 40 inches in the headwaters
 - 10-inch overnight accumulations are rare, but occurred in 1995 and 1998

Unimpaired Carmel River Flow at San Clemente Dam Site: 1902- 2008



Mediterranean Climate



Above - Carmel River
steelhead, June 1988
(photo: MPWMD).

Left - San Clemente
Dam, March 10, 1995
(photo: California American
Water).



Highly Variable
Landscape from
the ocean to
headwaters

Above - river flow through
the "slot" at the Carmel River
mouth, April 25, 2008

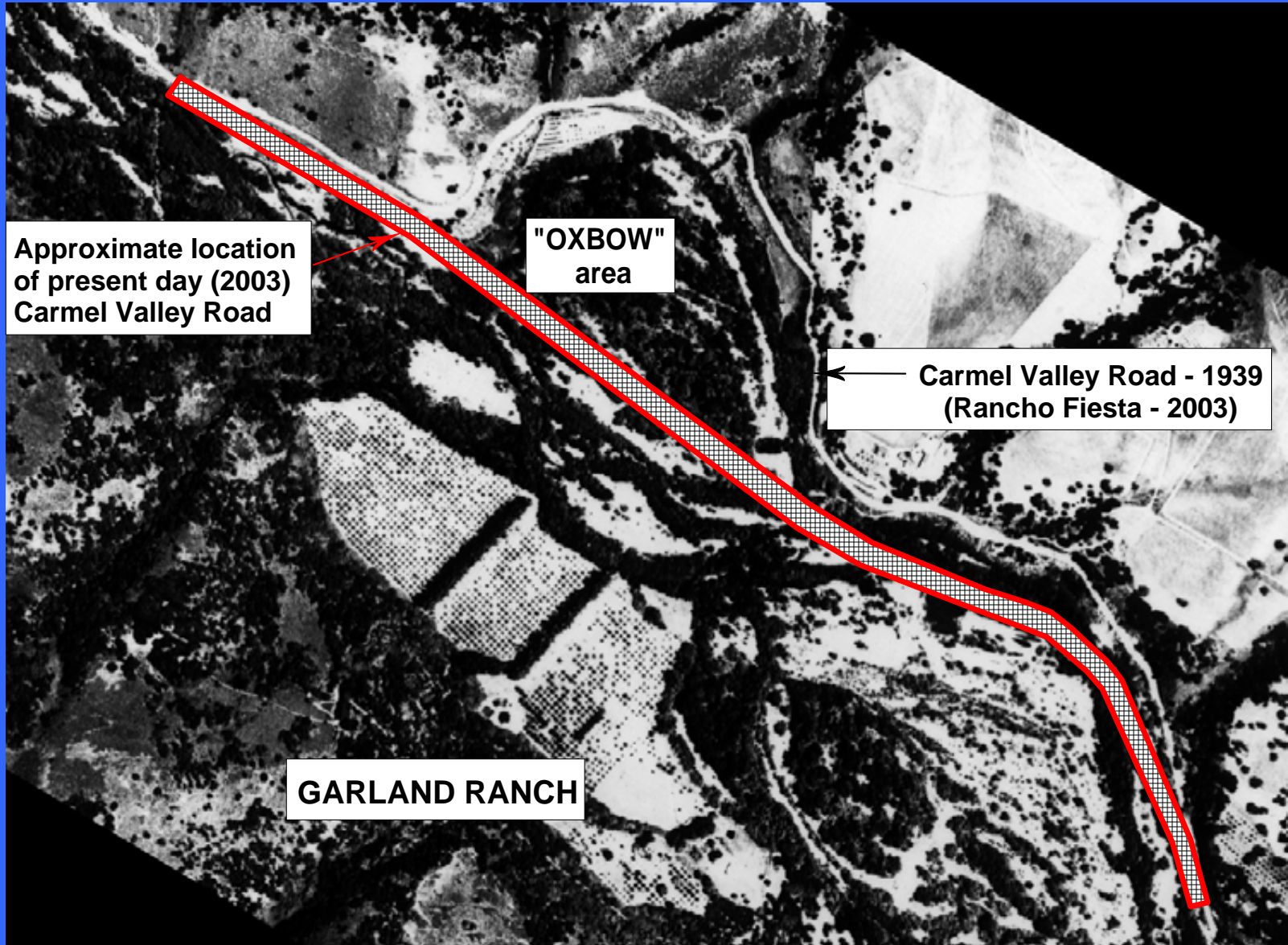
Right - Upper Carmel
River, 2007



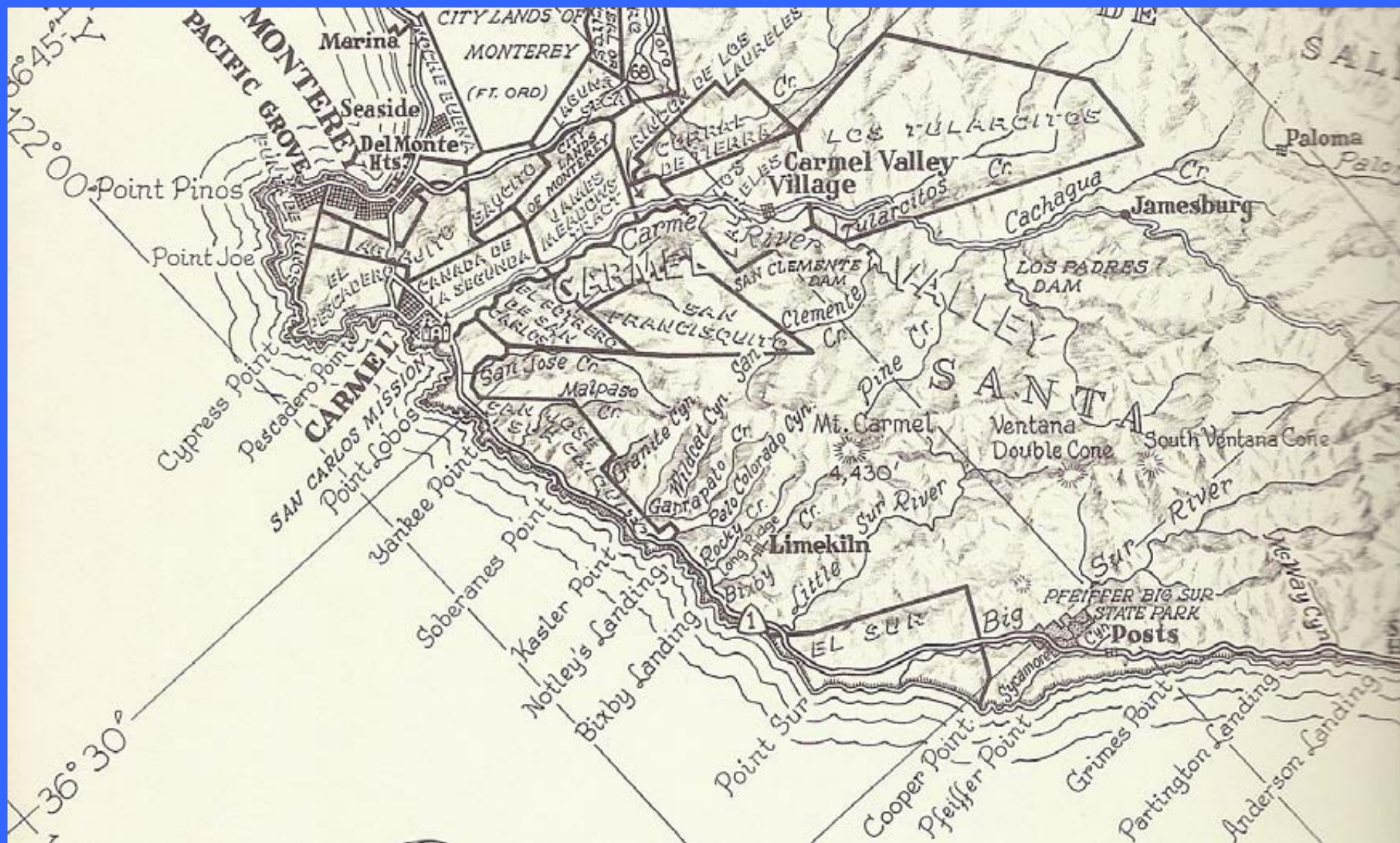
Lower Carmel River - Cultural Features

- Highly erodible channel banks
- 19 bridges, 3 dams
- >420 riverfront properties
- >1,500 parcels in 100-year floodplain
- Alluvial portion of the river has been straightened and narrowed since the early 1900's
- About 438 acres of riparian area along the lower 18.6 miles of the river

River Straightening



Early Carmel River Water Supply Development: Ranchos (granted 1820's-1840's)



Joining of Carmel Valley to the Monterey Peninsula



Hotel Del Monte opened June 10, 1880 by Charles Crocker (Pacific Improvement Company)

Old Carmel Dam



May 6, 1985

Constructed circa 1880

- 700 Chinese laborers
- 25 miles of 12-inch iron pipe crossed river in five places
- first Monterey Peninsula municipal water supply



June 2008

San Clemente Dam



San Clemente Dam • March 29, 1932

Pat Hathaway Collection

Constructed
in 1921:
\$1-2 million

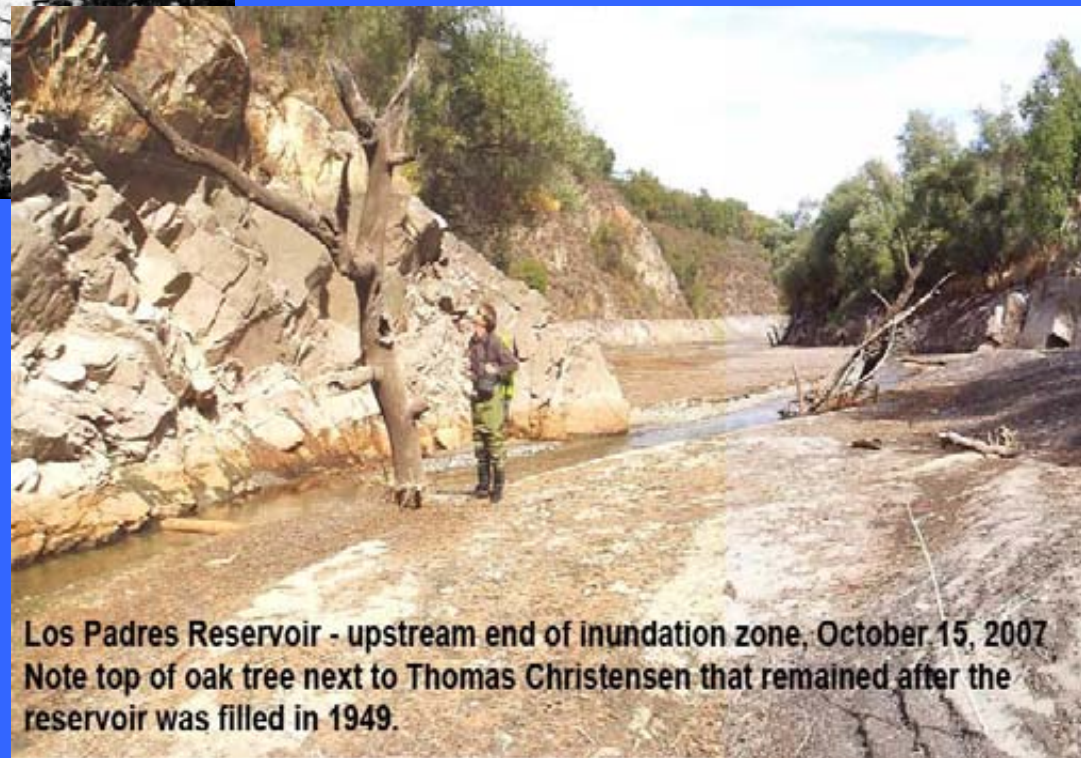


2007 cost to remove
> \$80 million

Los Padres Dam



Constructed
in 1949:
\$1.5 million

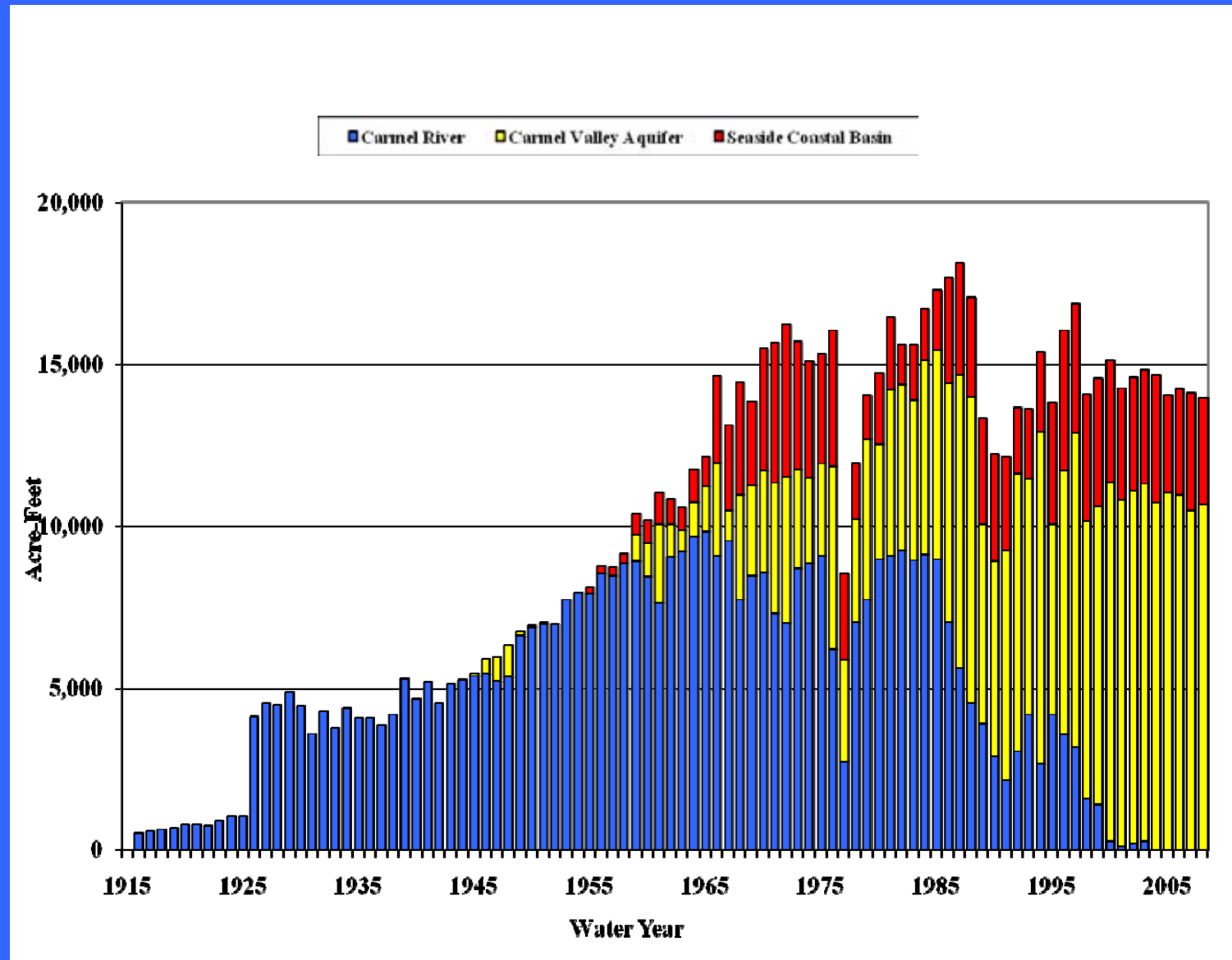


Los Padres Reservoir - upstream end of inundation zone, October 15, 2007
Note top of oak tree next to Thomas Christensen that remained after the reservoir was filled in 1949.

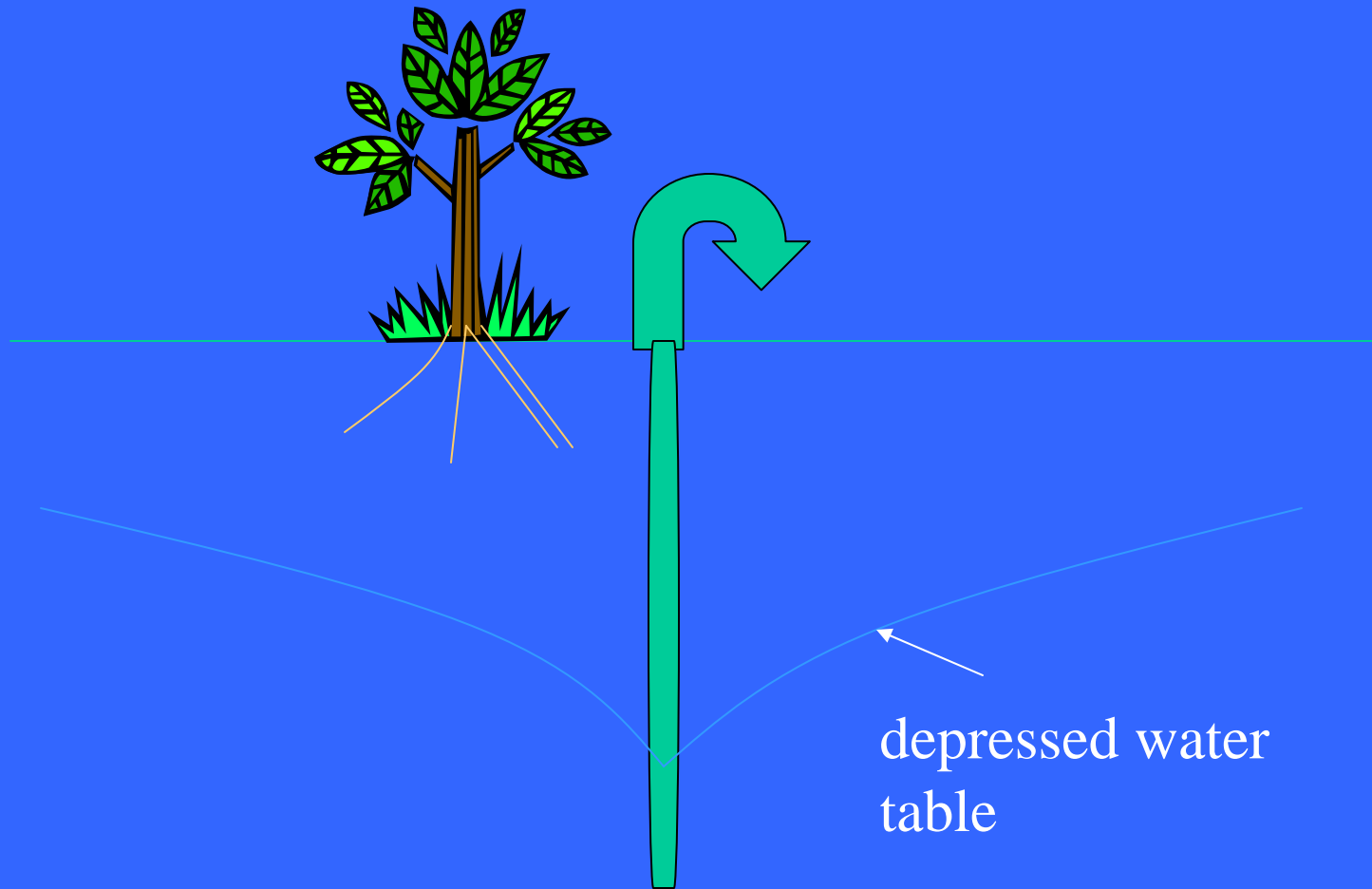
Monterey Peninsula Water Supply at a Glance

- Largest municipal water purveyor – California American Water – 15,000 AFY
- Cal-Am water supply from two source areas:
 1. Carmel River alluvial aquifer system – 75%
 2. Seaside Groundwater Basin – 25%

California American Water Production By Source: 1916 through 2008



Issue: Groundwater pumping impacts riparian vegetation and channel-bank stability



Schulte Project Area 1988

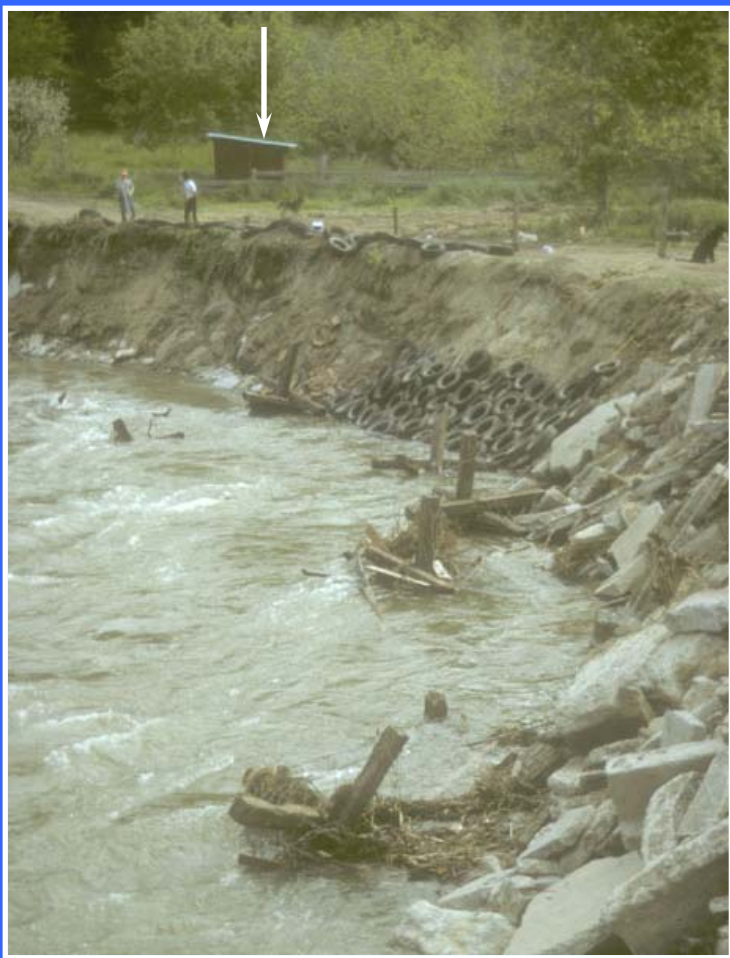


Schulte Project Area 2001



Schulte Project – 1982 and 2003

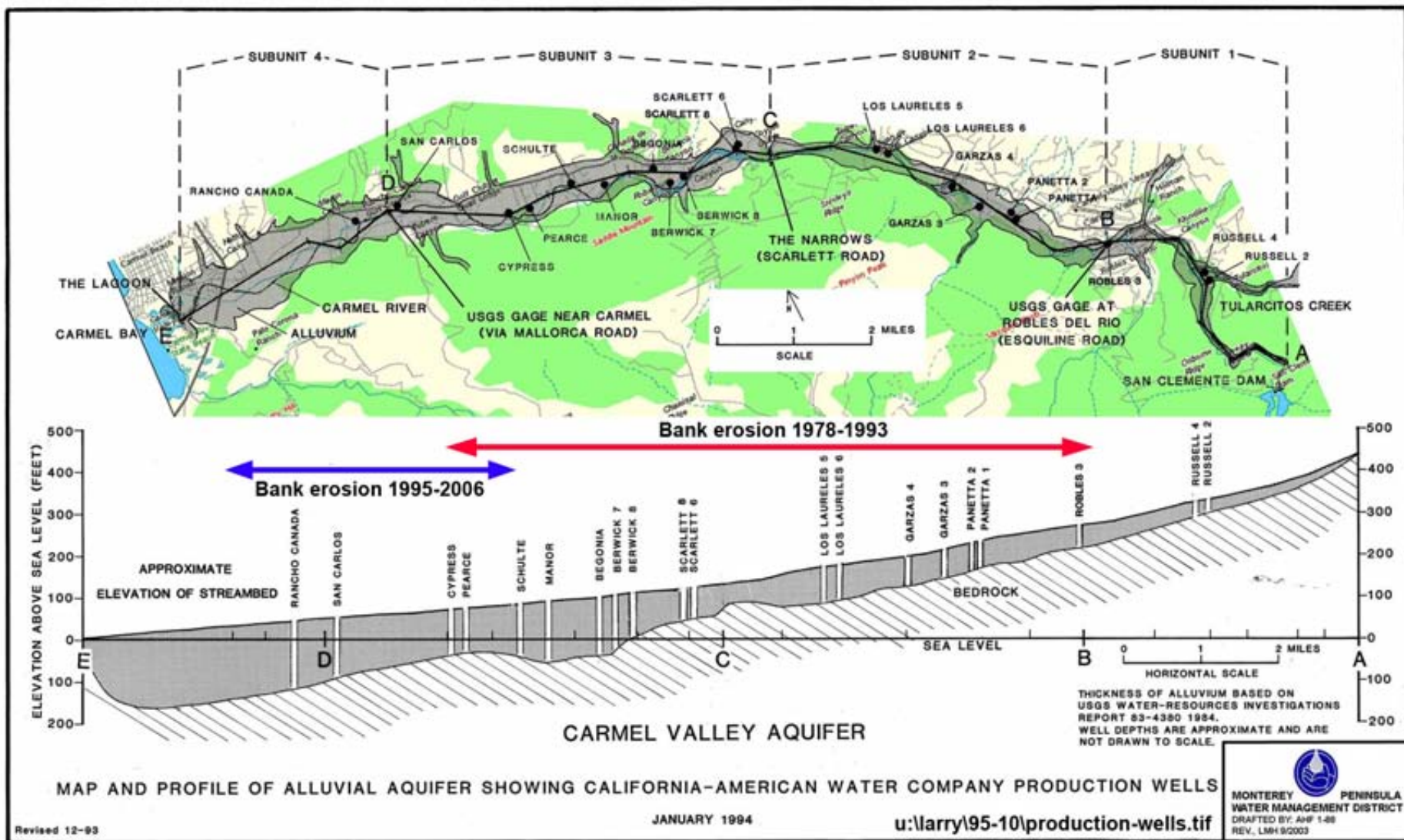
Left - Looking upstream from Schulte Bridge, April 1982. Note tires, wooden jacks, and concrete rubble dumped by the owner on the streambank to slow erosion.



Right - May 2003 - after MPWMD-sponsored restoration work. The arrow shows where the brown well pump building was at the upper left of the 1982 photo. MPWMD continues to maintain and monitor this project area.



Bank Erosion Problem Areas



Issue: ESA listings

- Red-Legged Frog, Steelhead listed as threatened species



Issue: Reservoir sedimentation and seismic safety

San Clemente Dam and Reservoir

Storage loss

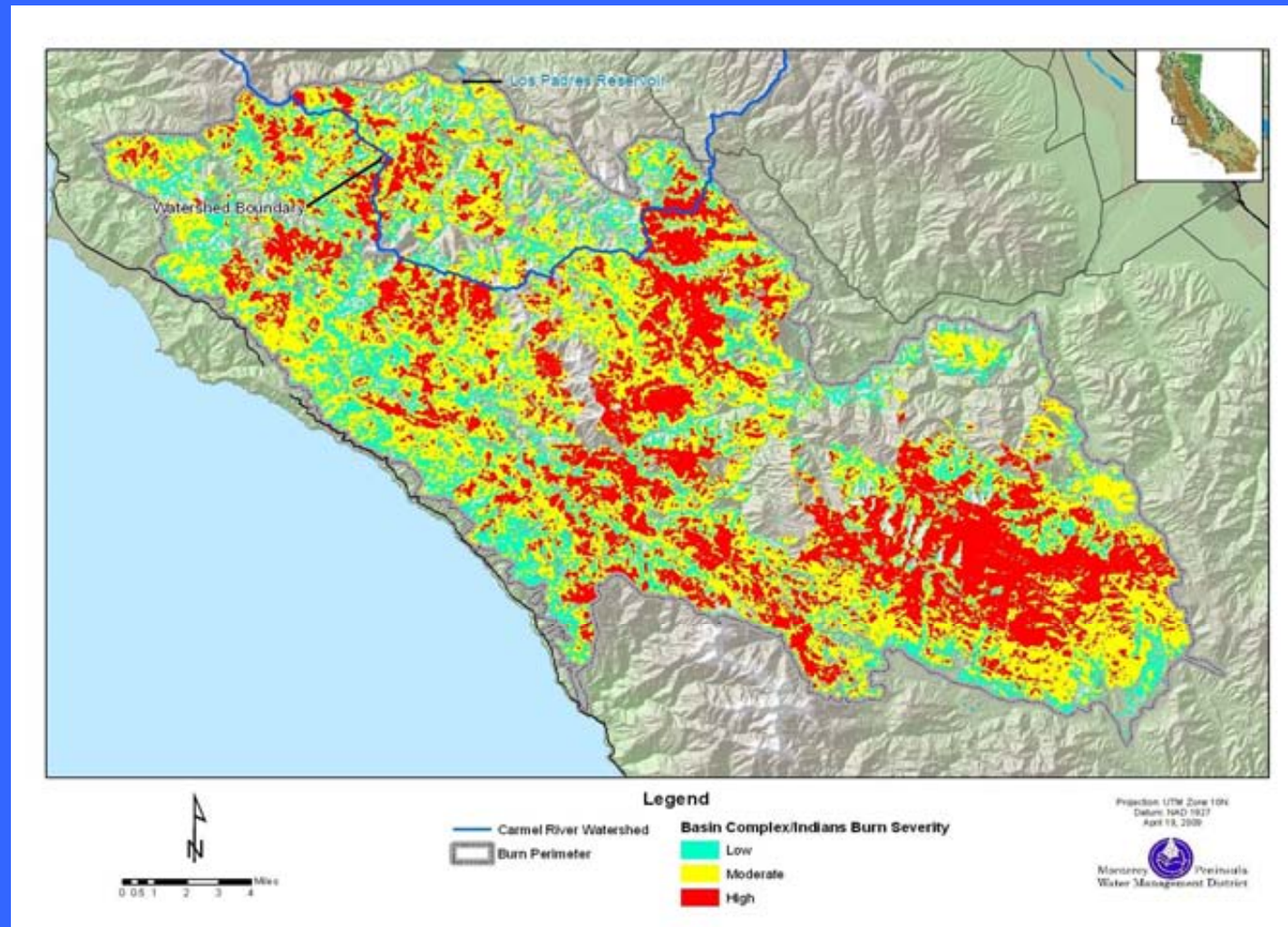
1921: 1,425 acre-feet
2008: < 100 acre-feet

Proposals:

- Strengthen dam
- Remove dam and re-route river



Issue: 2008 Basin Complex Fire burned approximately 20% of Carmel River Watershed



From Los Tulares – July 2, 2008



Fire
Hastens
Mass
Wasting

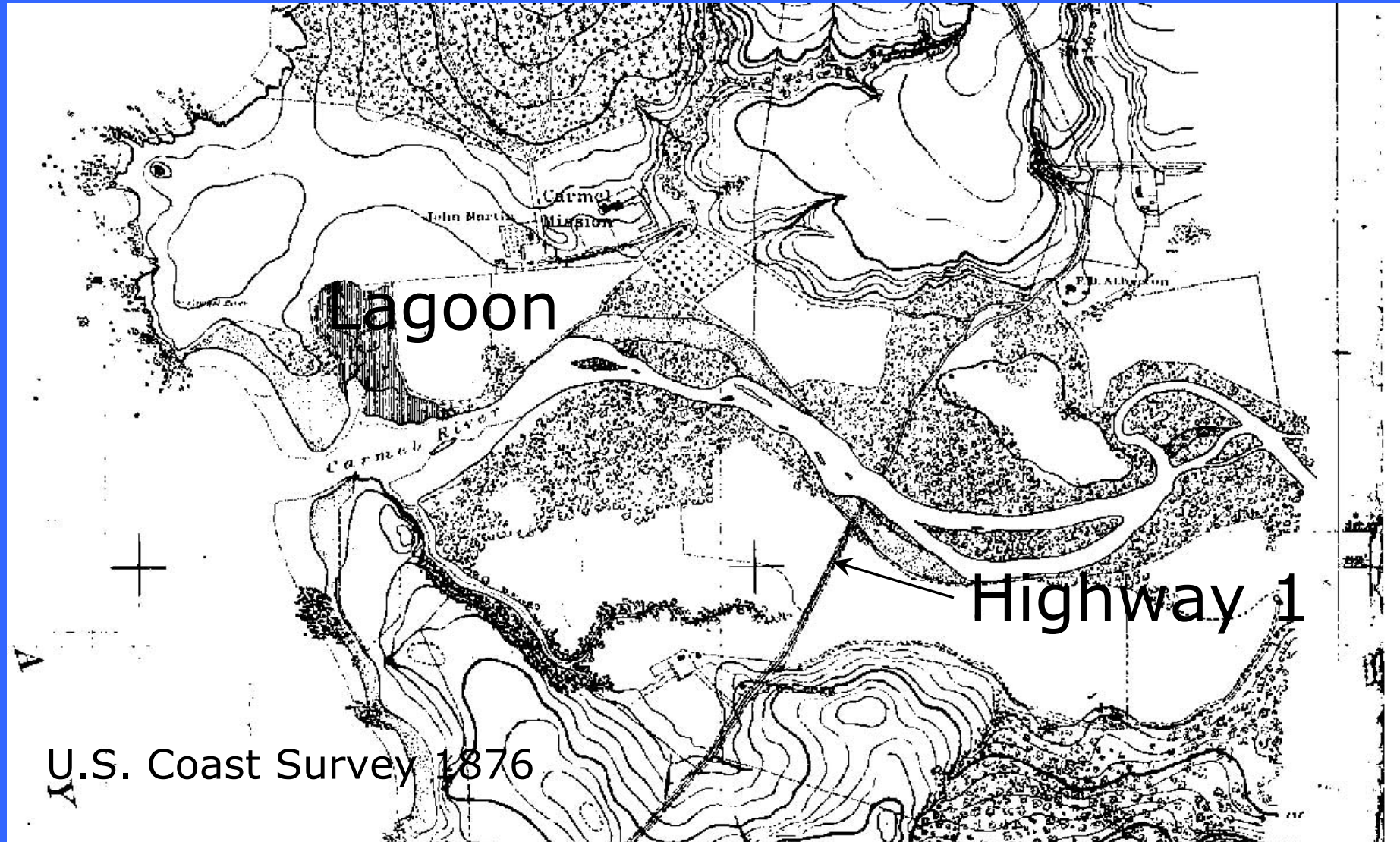
Below - Danish Creek watershed – July 12, 2008



Basin Complex Fire Will Increase Sediment Load into Los Padres Reservoir



Issue: Lagoon and Wetlands Management





ca 1900

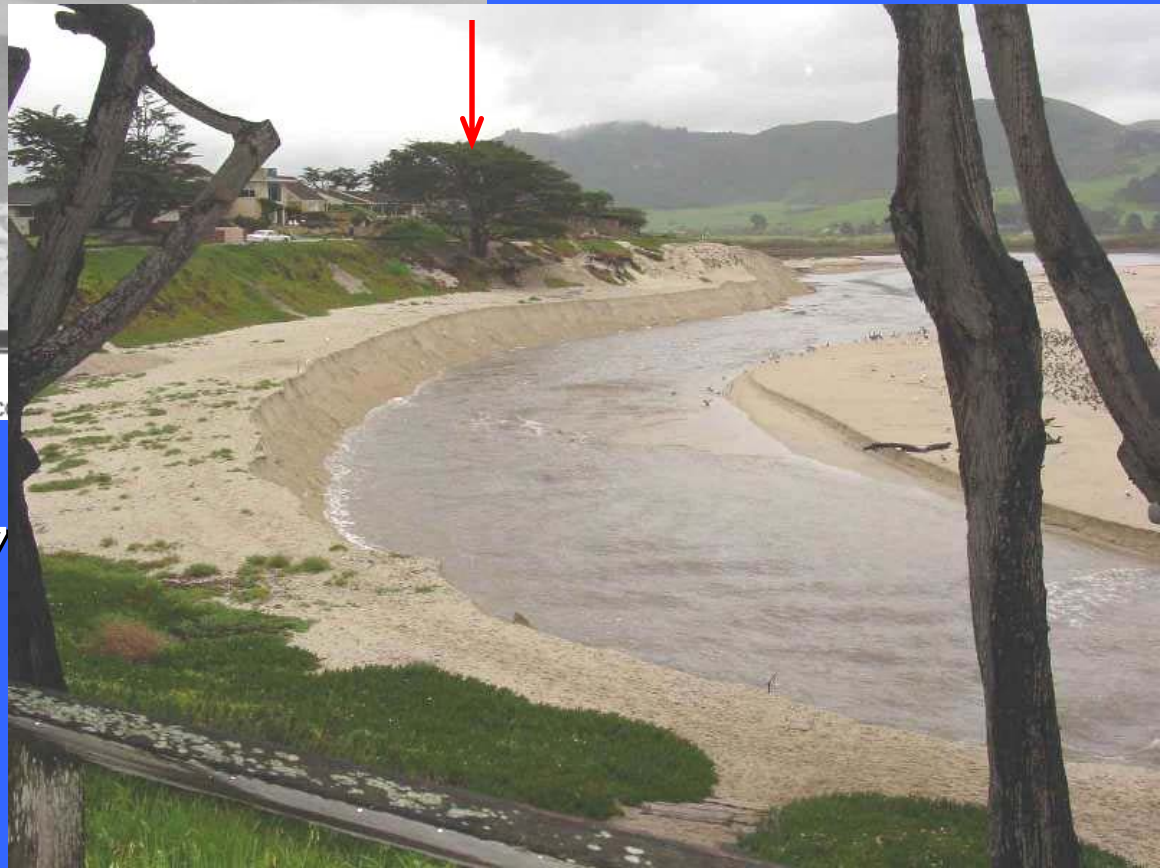


2005

JUN 23 2005

Breaching
the the
Carmel River
State Beach
– an old
tradition

Stewart's Cove



Pat Hathaway Photo Collection (831) 373-3811 www.caviews.com

above – ca spring 1937

right - March 4, 2005

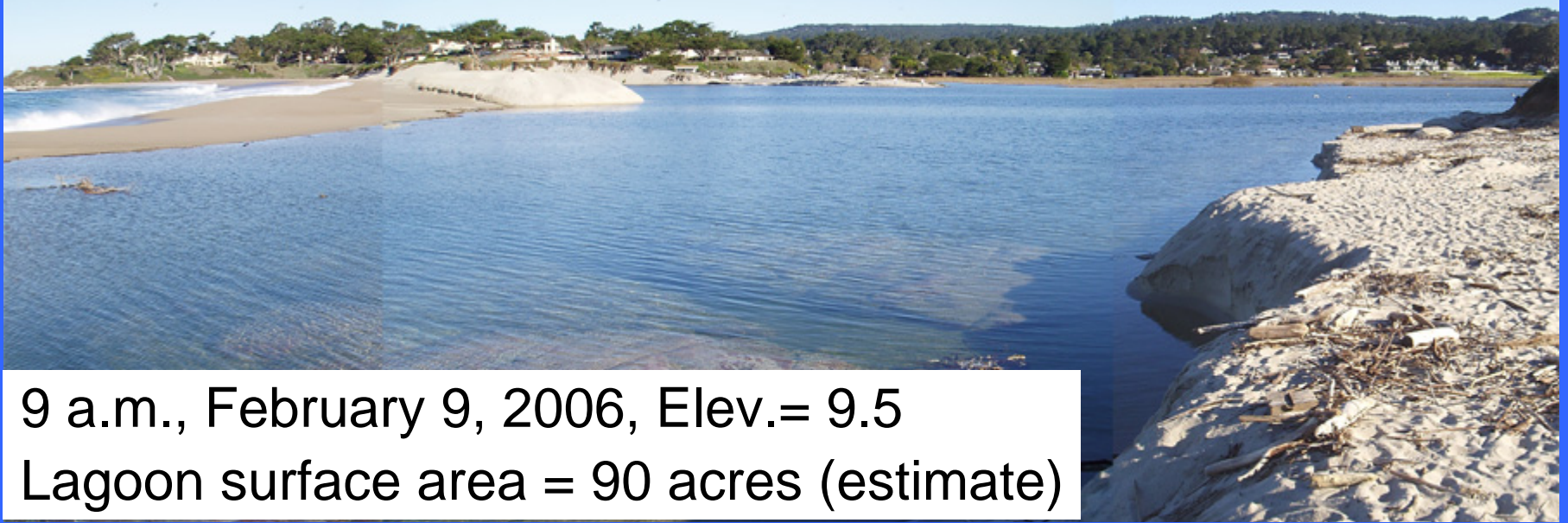


**35-FOOT
WAVES
HIT THE
BEACH**



**STORM SURGE
JANUARY 5, 2008**

High and low water comparison



Constraints: Water Supply Regulations

- State Water Resources Control Board Order (1995): Orders reduction in Cal-Am Carmel River extractions by 70 %
- Seaside Basin Groundwater Adjudication (2006): Orders reduction by Cal-Am and other pumpers by 46 %



Opportunities:

- Coastal Water Project
- Regional Project



**Thank you for your
attention.**

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