The Marsh Preserve – Historical and Current Conditions

Los Peñasquitos Lagoon Enhancement Plan Update Workshop I

October 20, 2012

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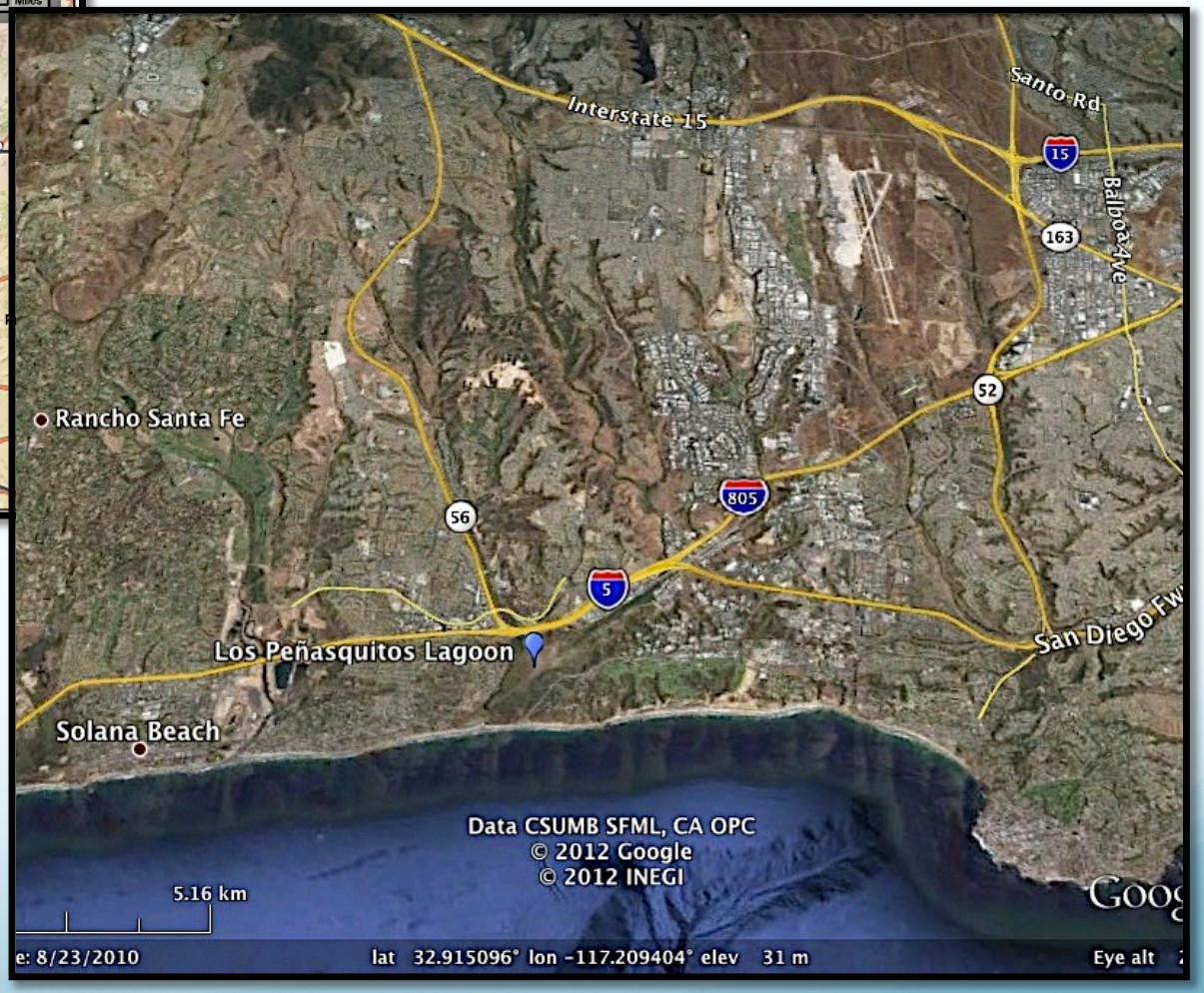
Los Peñasquitos Lagoon Foundation

Where is Los Peñasquitos Lagoon and its Watershed????

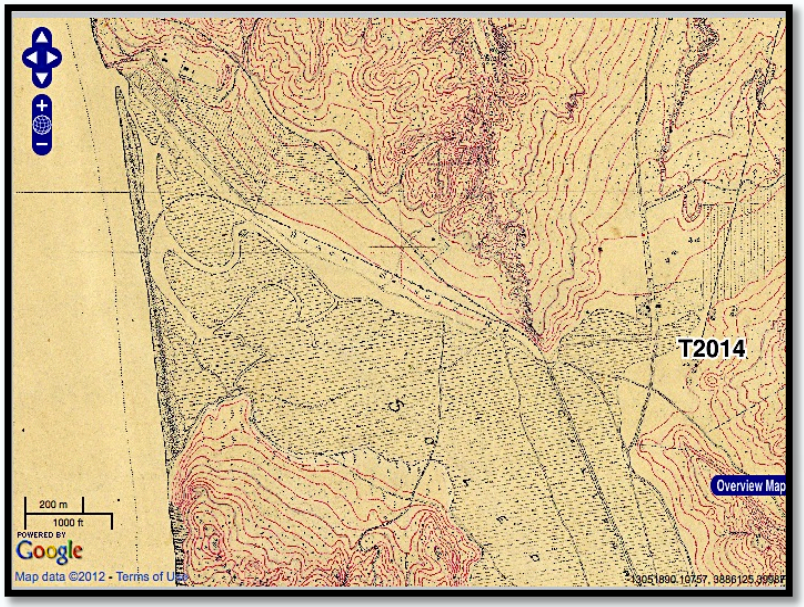
Graphic by Weston Solutions Inc. (2012)

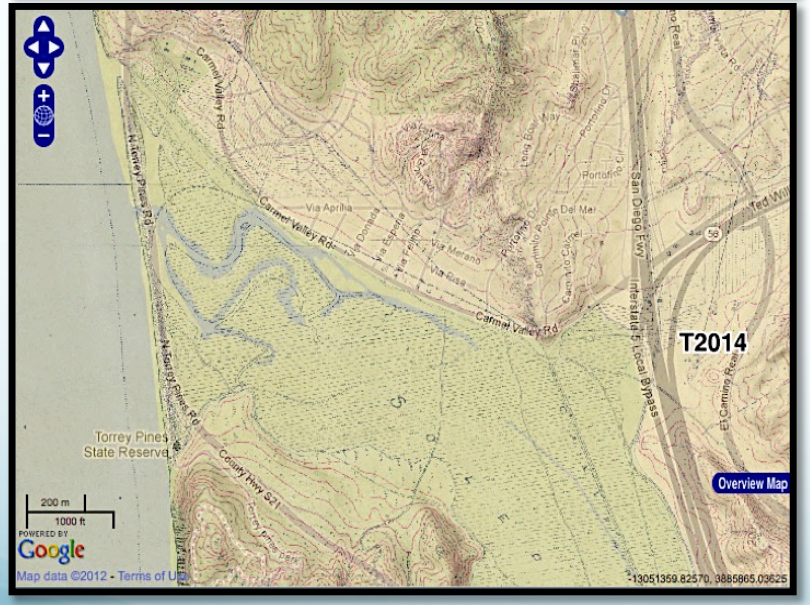


Graphic adapted from Google Earth. (2012)

Drawing upon the Past to Plan the Future

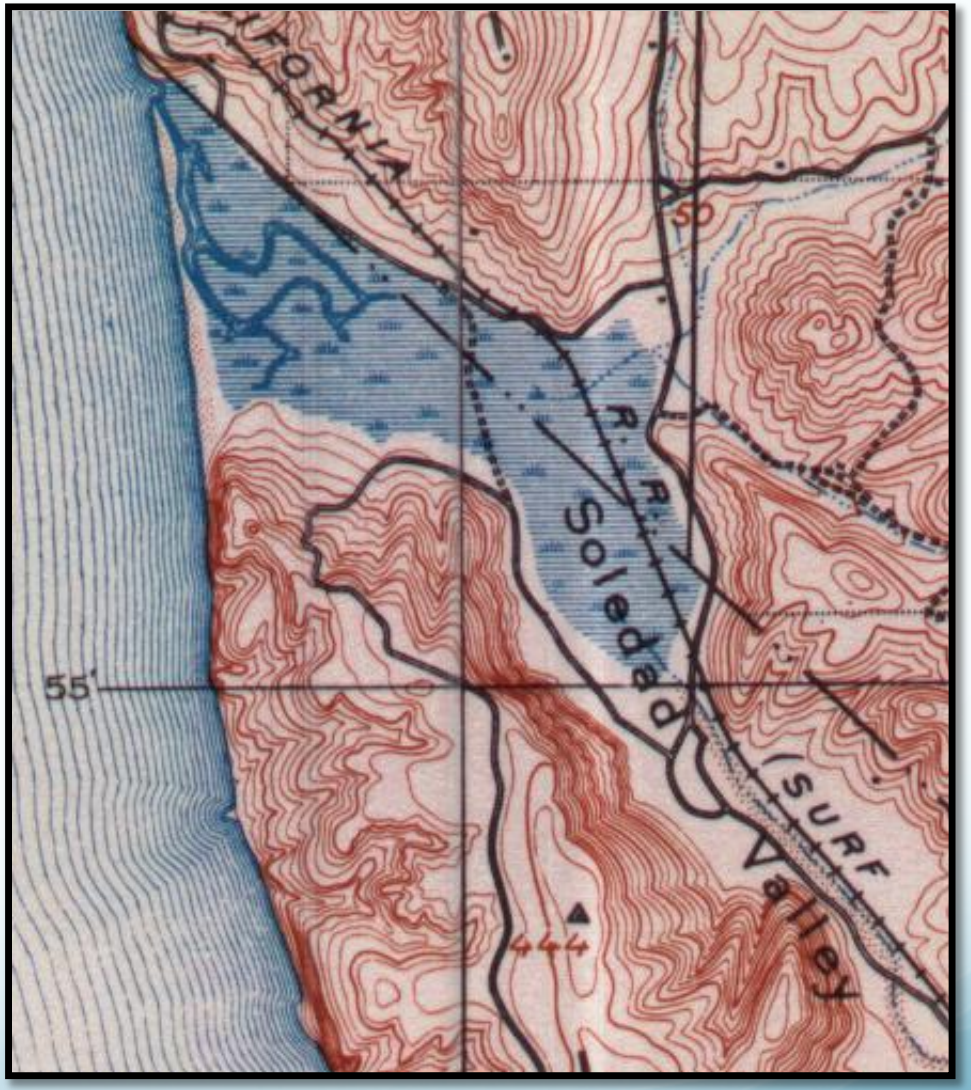
What a long, strange trip it's been……





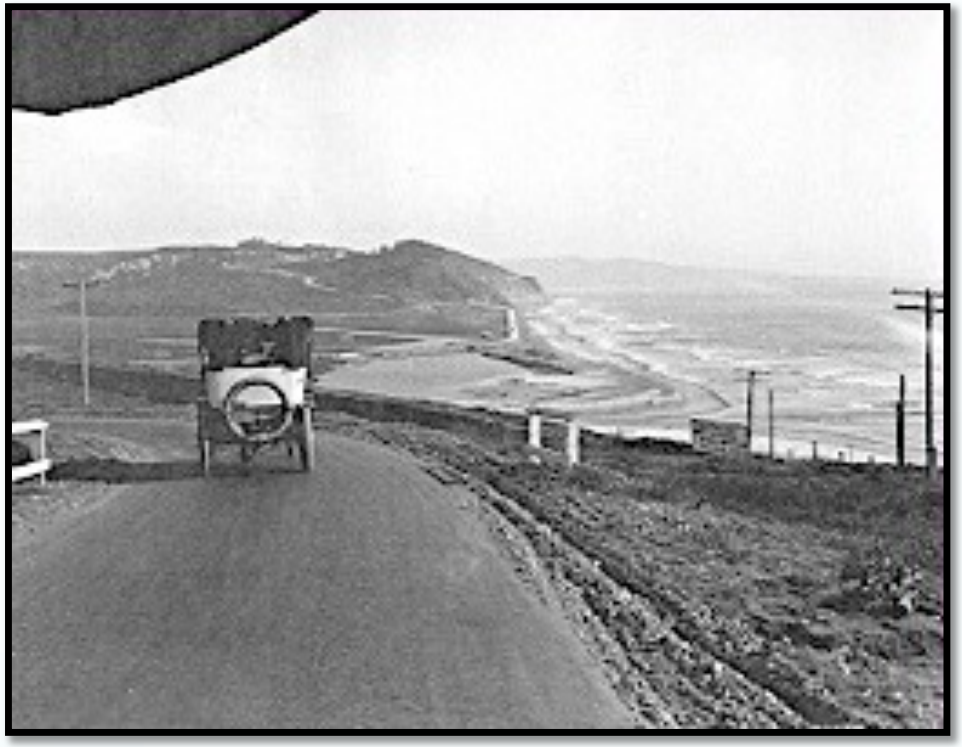
Los Peñasquitos Lagoon – 1889.

Graphic by Southern California Coast T-Sheets.
www.caltsheets.org



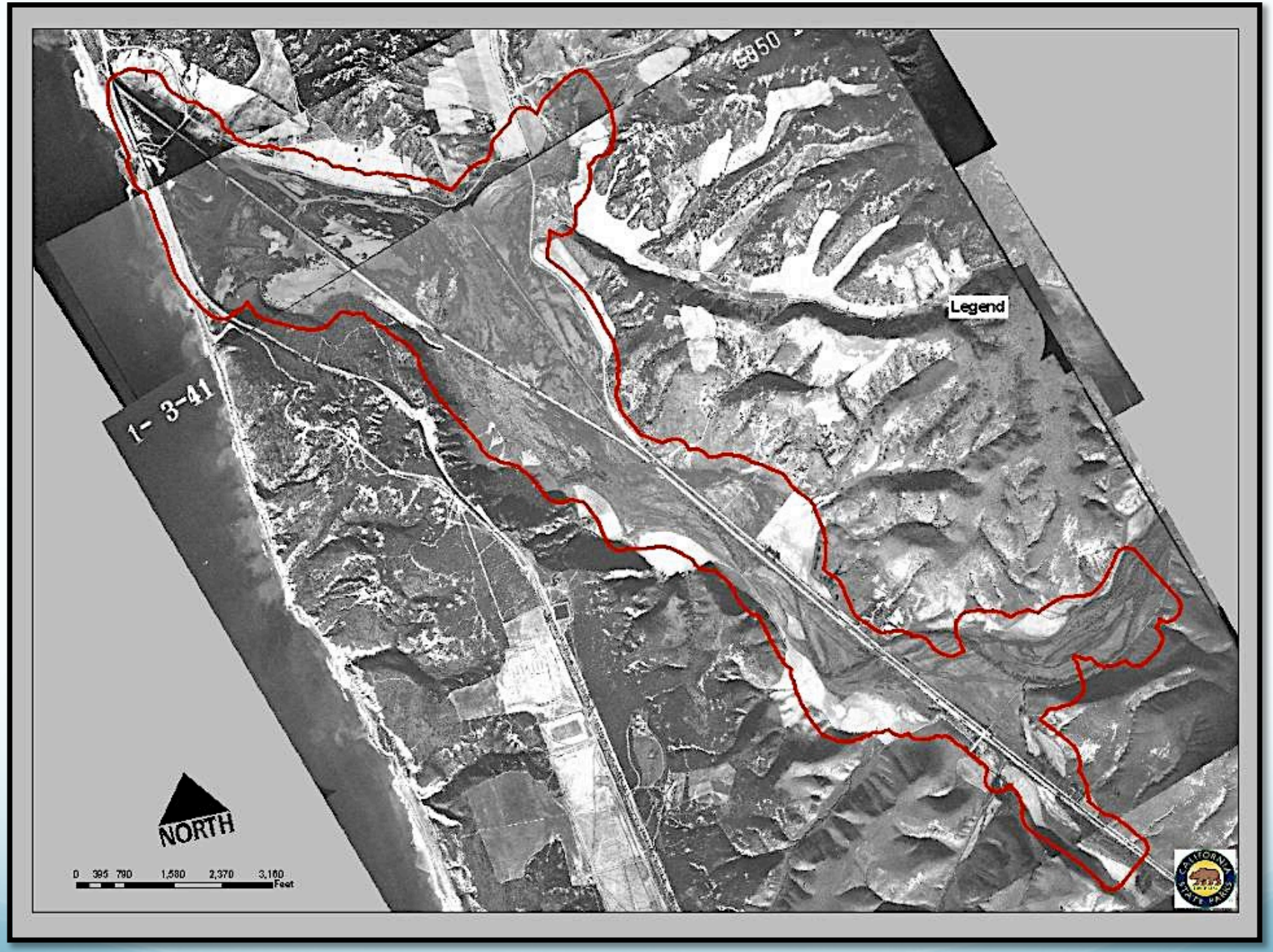
Los Peñasquitos Lagoon – 1905.

Graphic provided by CA State Parks.



Driving to Los Peñasquitos Lagoon in a Ford Model A – Early 1920s (pre-Highway 101).
Photo from U.S. 101 Photo Gallery.

The new Highway 101 and railway alignment at Los Peñasquitos Lagoon – Early 1930s.
Photo from U.S. 101 Photo Gallery.



Los Peñasquitos Lagoon – 1941.

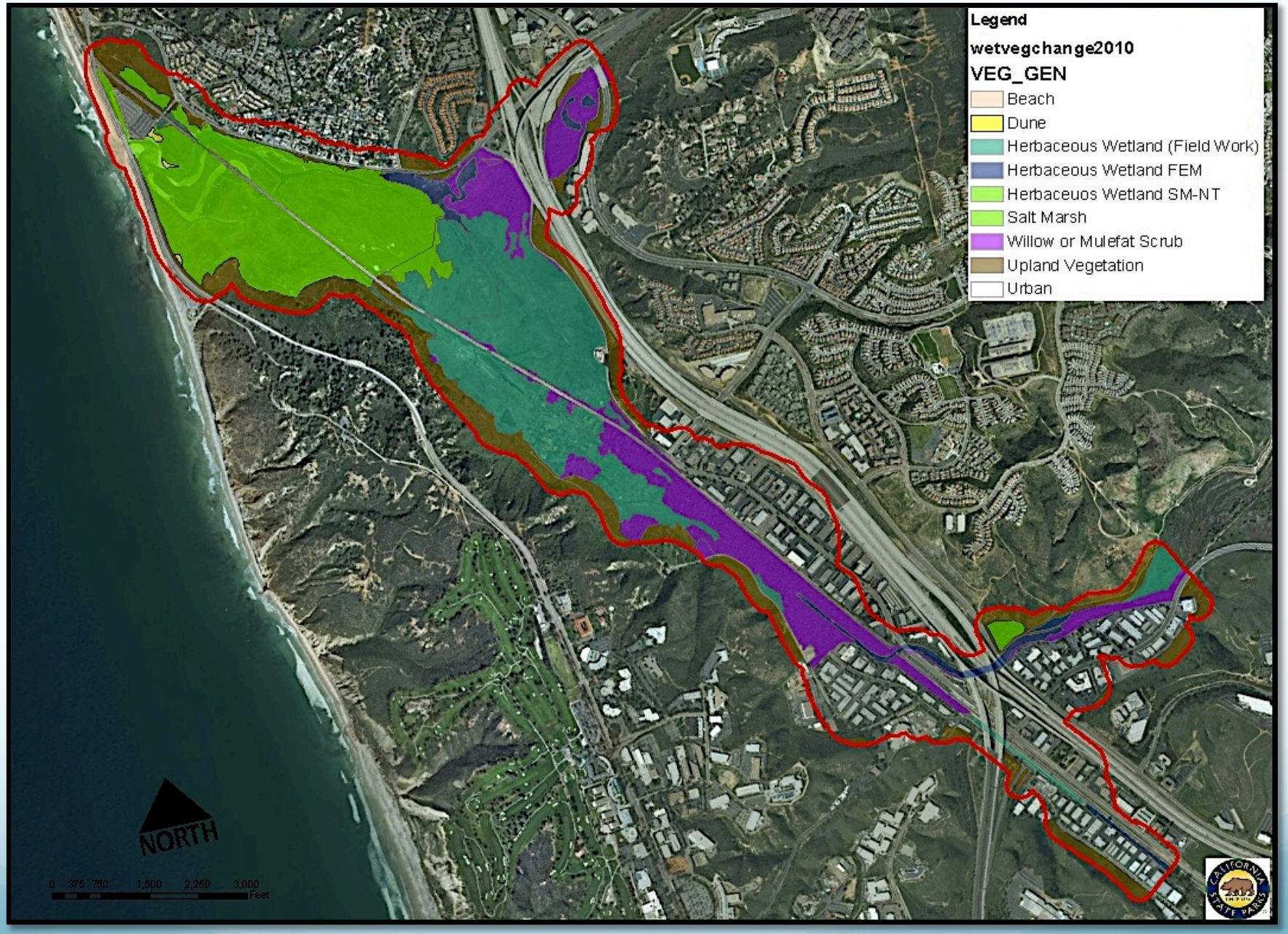
Graphic provided by CA State Parks. (2011)

Los Peñasquitos Lagoon – Early 1970's.

Graphic provided by CA State Parks. (2011)

Los Peñasquitos Lagoon – 2010.

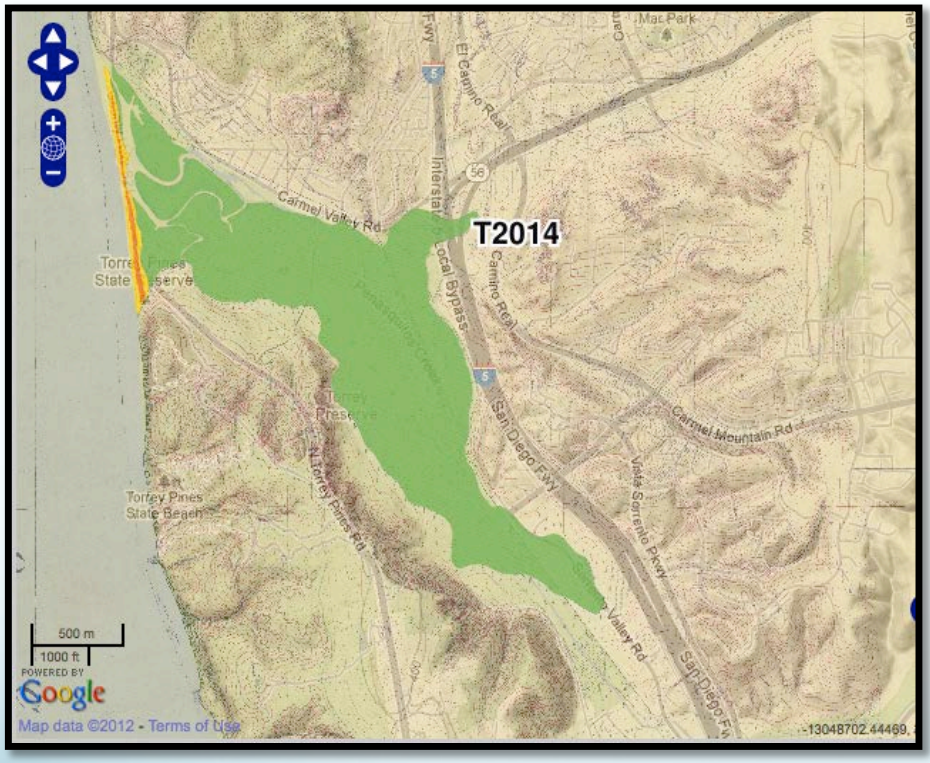
Graphic provided by CA State Parks.



Habitat Distribution in Los Peñasquitos Lagoon – 2010.

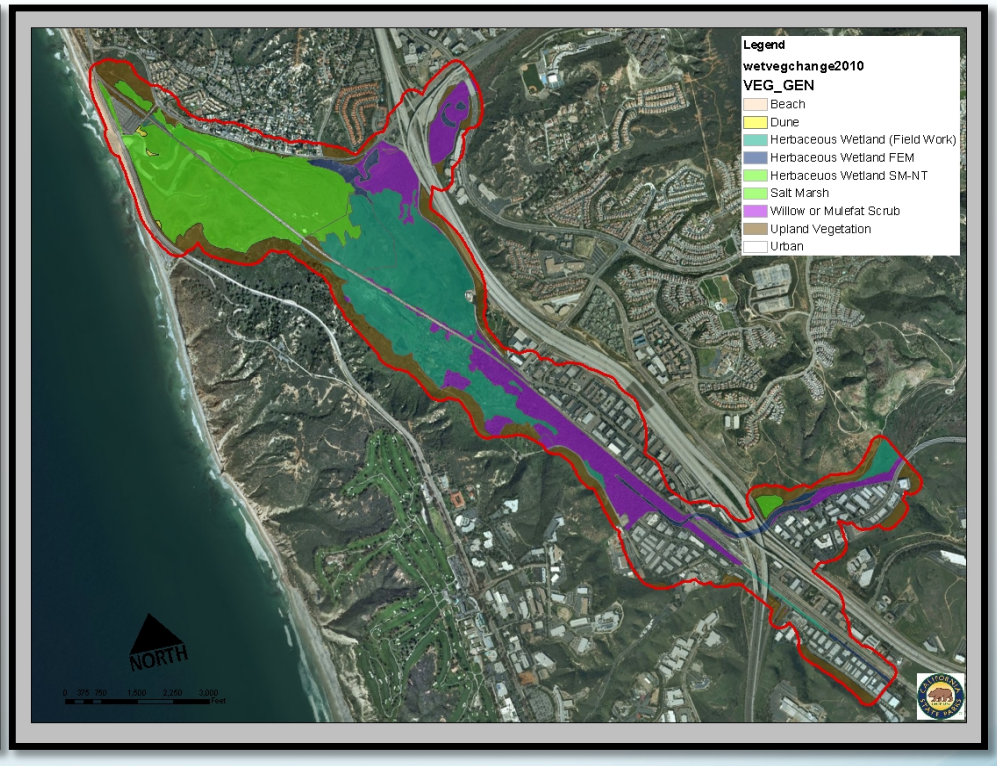
Graphic provided by CA State Parks. (2011)

Habitat Type and Distribution in Los Peñasquitos Lagoon: Historical vs. Contemporary



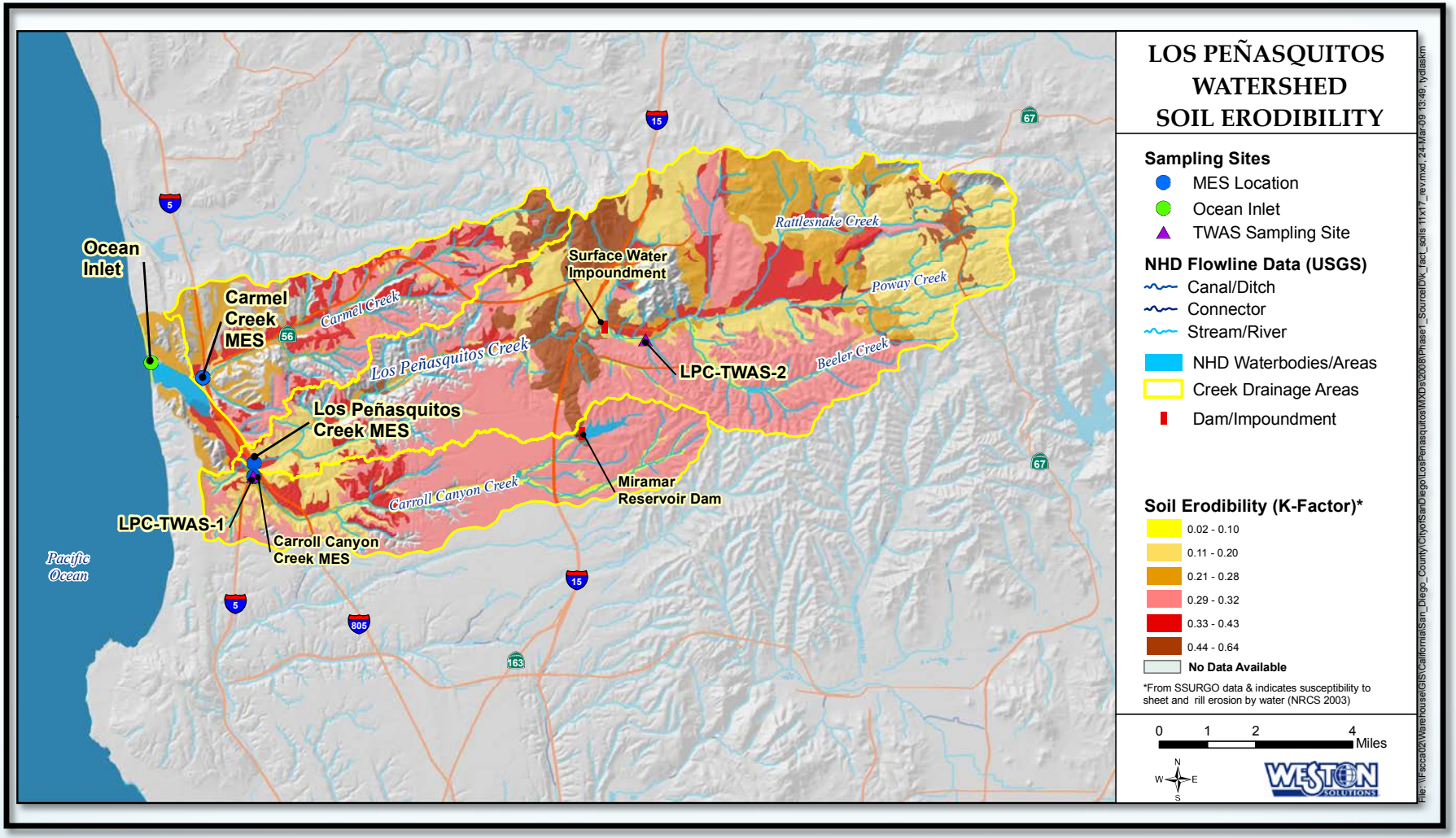
1889

Graphic by Southern California Coast T-Sheets



2010

Graphic provided by CA State Parks. (2011)



The Majority of Soils are Moderate to Highly Erosive

Yellow = Resistant

Pink and Red = Moderately Erosive

Brown = Resistant/Moderately Erosive

Dark Brown = Highly Erosive

Graphic by Weston Solutions, Inc. (2009)

Proposed Date (A.D.)	Sedimentation Rate (mm/year)	Pollen or Sediment Data	Probable Cause
1965-1975	4.1	First Tamarisk (Salt Cedar) pollen	Expansion of Tamarisk in watershed.
		Increase in Salix (Willow) pollen	Expansion of Salix in watershed.
		First Picea (Spruce) pollen	Landscaping in adjacent developments.
		Increase in Pb deposition	Interstate 5 built in 1964.
1925-1935	5	Minimum of Sarcoconia (Pickle Weed) pollen	Bare mud flats of fresh sediment fill estuary - Railway berm relocated to middle of the Lagoon (1925), completion of Highway 101 (1932).
		Maximum of Tubuliflorae pollen	Weeds propagate in areas disturbed by ranching and agriculture within the watershed and around Lagoon.
1910-1925	4	Shift toward finer grained sediments	Mouth of the Lagoon closed by accumulating sediments, road construction (1905), railway berm relocated to middle of the Lagoon (1925).
1860-1880	3.2	*Erodium* pollen rises	Intensive cattle grazing era (Ruiz-Alvarado Rancho) - decline in grass forage, increase in *Erodium.*
1820-1840	3.8	Magnetic susceptibility rises, Mn concentration rises	Disturbance of magnetite and manganese bearing sandstone on uplands.
		High charcoal values	Fire used to clear chaparral forage - Ranching begins in Los Peñasquitos Canyon in 1823.
		Trace *Erodium* (Storksbill) pollen	*Erodium* already present in the watershed.
1650-1760	0.23 to 0.29	Absence of settlement indicators	No presence of *Erodium* until Mission Period (1769).

Table adapted from Cole and Wahl (2000)

Key Points from Previous Table

Sedimentation rates increased by an order of magnitude in conjunction with settlement.

- 1650 – 1740: 0.25 mm/year.
- 1820 – 1975: 3.2 – 5 mm/year.
- 49 – 55 cm (19 – 22 inches) of excess sediment since 1749 at the core site.
- Shift toward finer grain sediments between 1910 – 1925 due to inlet closures and obstructions caused by two railway berms

Graphic adapted from Google Earth (2012)

So What's the Big Deal about 49 – 55 cm (19 – 22 inches) of Excess Sediment ?

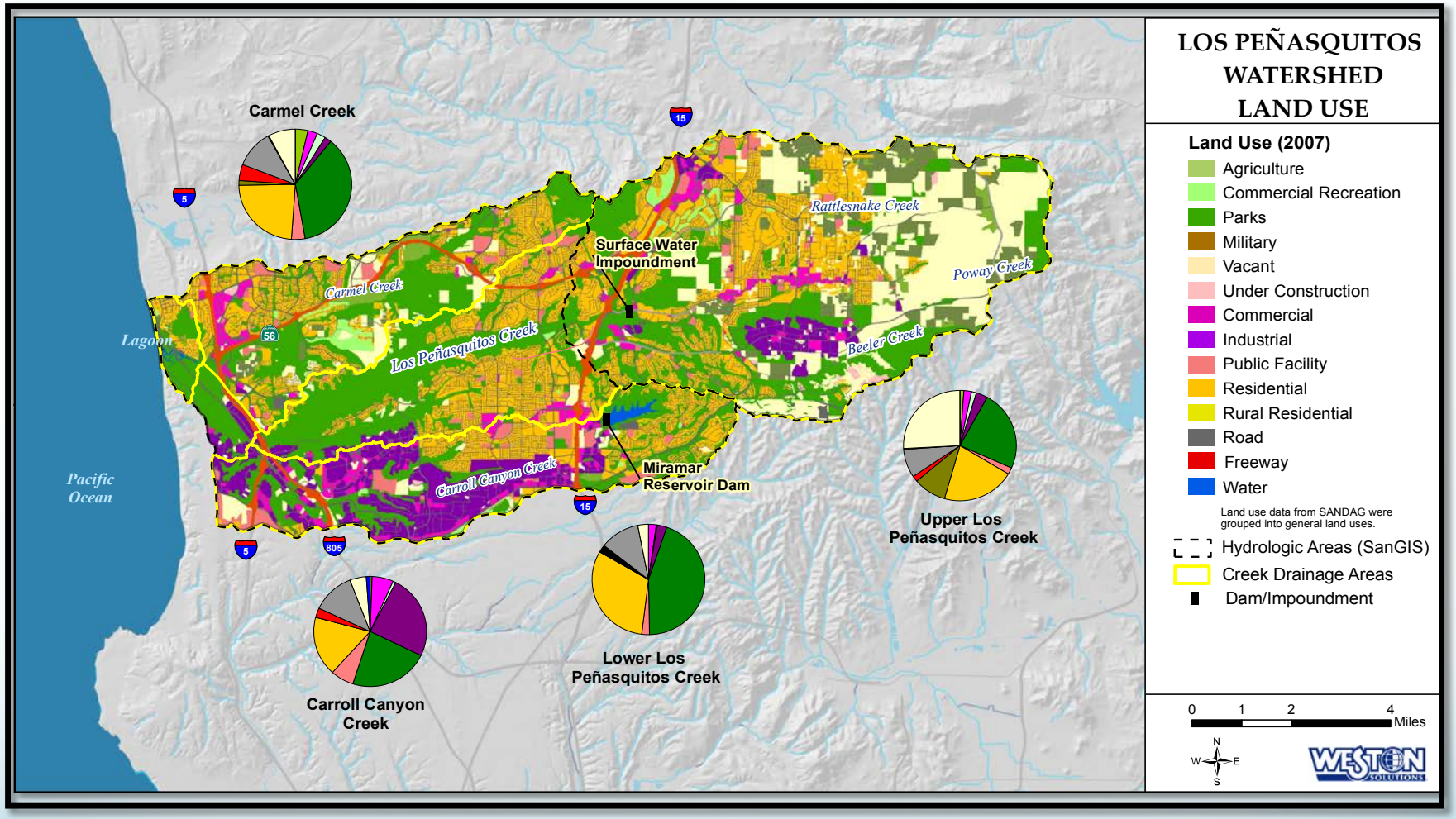
Elevation Range for California Salt Marsh Vegetation =

0 – 70 cm (27.5")

(Zedler 1999)

Graphic adapted from Google Earth (2012)

Land Use in the Los Peñasquitos Watershed



54% = Developed 46% = Impervious Surfaces

Graphic by Weston Solutions, Inc. (2009)

Hydromodification + Erosive Soils = Impacts

Dry Weather Flows
Photo by Mike Hastings (2011)

Increased Volume & Peak Flows
Photo by Mike Hastings (2011)

Scour and Gullies
Photo by Mike Hastings (2002)

Deposition
Photo by Mike Hastings (2010)

Post Rain Event - 2003.
Photo provided by the City of San Diego

Sediment Plume - 1983.
Aerial provided by CA State Parks.

Habitat Conversion - 2000.
Aerial provided by CA State Parks.

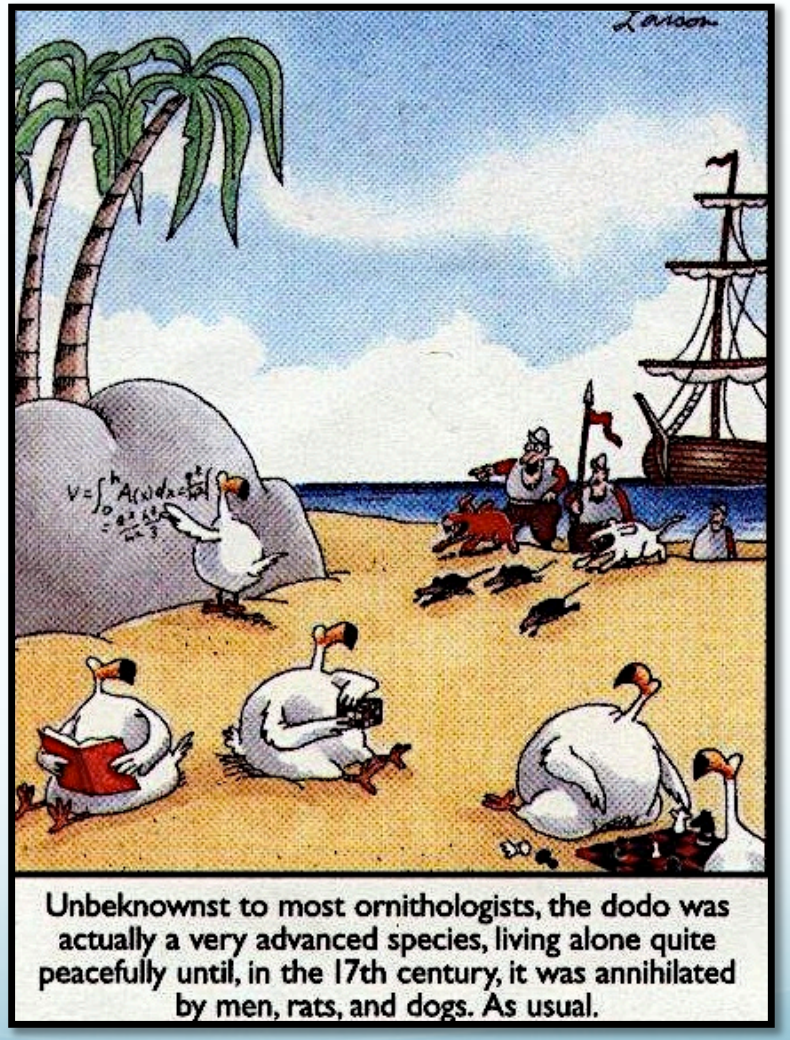
Established Riparian - 2010.
Aerial provided by CA State Parks.

So What Do We Do?

Given what we know, will we use the right approach?

Comic by Gary Larson

Will we do more harm than good?



Comic by Gary Larson

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Special Thanks

Los Peñasquitos Lagoon Foundation
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Scripps Institute of Oceanography
Gary Larsen

REFERENCES

Cole, K. and E. Wahl. 2000. *A Late Holocene Paleoecological Record from Torrey Pines State Reserve, California*. Quaternary Research 53, pp. 341-351.

Southern California Coast T-Sheets. www.caltsheets.org

Zelder, J. *et al*. 1999. California Salt-Marsh Vegetation: An Improved Model of Spatial Pattern. Ecosystems. Vol. 2, No. 1 (Jan-Feb 1999), pp. 19-35.