

SAN DIEGUITO LAGOON RESTORATION PROJECT

LAGOONS, INLETS, AND BEACHES

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Why Do We Need to Keep the Lagoon Inlet Open?

Biologically

- ▶ Lagoons are important ecological systems. Southern California lagoons have been recognized by pioneering wetlands scientists for their value in supporting endangered species and diversity.
- ▶ Lagoons provide habitat for migratory birds.

Economically

- ▶ These lagoons support fish spawning, which supports local commercial and sport fishermen.
- ▶ These lagoons provide recreation to the public.



When the Lagoon Inlet Is Closed...

Biologically

- ▶ The system begins to deteriorate rapidly.
- ▶ Invertebrates and fish species die.
- ▶ Loss of habitat for commercial fish species (e.g., halibut) occurs.
- ▶ Loss of migratory bird use occurs.
- ▶ Increase of freshwater leads to habitat change (e.g., invasive species and algae).
- ▶ Potential increases for mosquitoes and viral outbreaks (e.g., West Nile virus).



- Salinity high
- Oxygen low
- Temperature high
- Algae growth



Do We Know the Effects of Opening Southern California Lagoons on Beaches?

- ▶ **YES.** *There are no effects.*

On What Basis Do We Know That There Are No Effects?

SCE conducted an extensive monitoring program from the project start date in 1992 until the present. The program consisted of:

1. Beach profile surveys,
2. Lagoon channel cross-section surveys,
3. Water quality surveys,
4. Water level measurements,
5. Flood flow measurements, and
6. MORE (the project is designed such that it will have no impact on river sediment charge or longshore sand transport.

What Information Does the Data Give Us About Beaches?

1. Beach conditions in summer and winter,
2. Effects of floods on beaches,
3. Effects of wave storms on beaches,
4. Effects of artificial lagoon openings on beaches,
5. Inlet cross-sections (access), and
6. Inlet area at high and low tides (access).

Beach Conditions in Summer and Winter



SUMMER



WINTER

Difference between beach widths during summer and winter is 150 feet (regardless of whether inlet is open or closed).

Beach Conditions in Summer and Winter



SUMMER

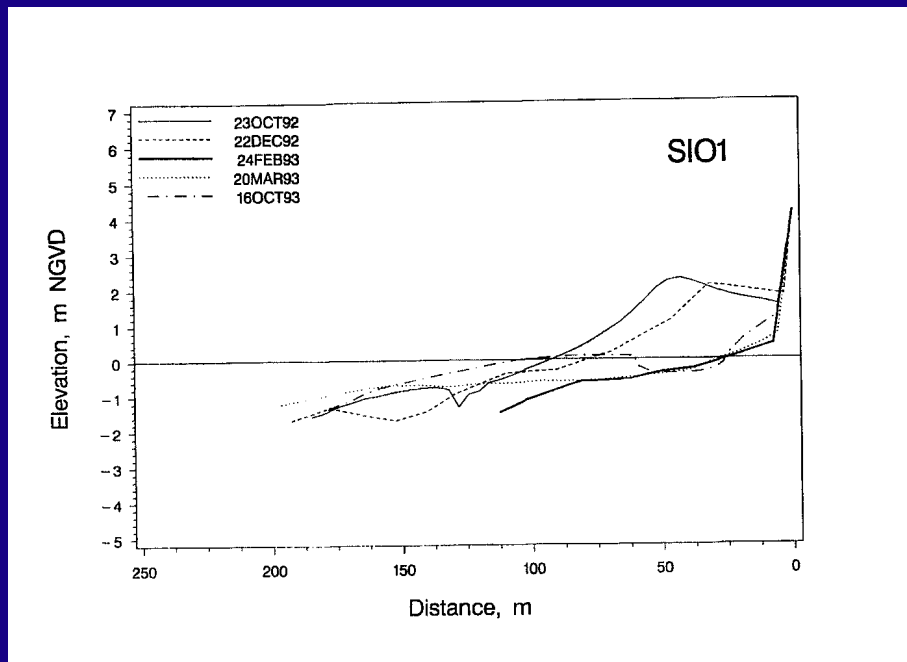


WINTER

Difference between beach widths during summer and winter is 150 feet (regardless of whether inlet is open or closed).

Effects of Floods on Beaches

Effects of February 1993 flood on beaches



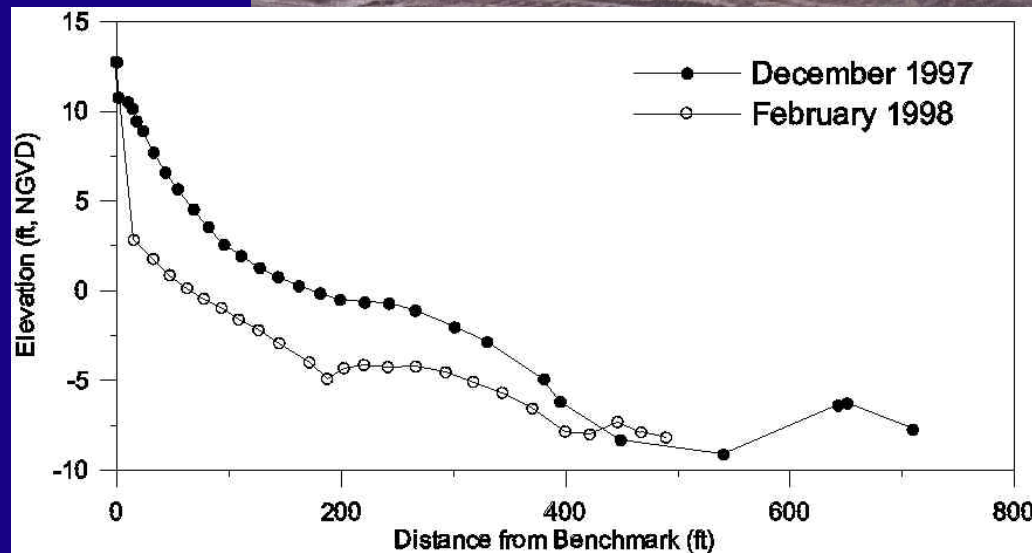
Conclusions About Effects of Floods on Beaches

- ▶ Floods have large effects on beaches located near the lagoon.
- ▶ Beach width decreases by 300 ft.
- ▶ This occurs regardless of whether the inlet is open or closed prior to the flood.

Effect of 1997-98 El Niño Wave Storm on Beaches

Property far
away from
lagoon

Regardless of
whether inlet is
open or closed

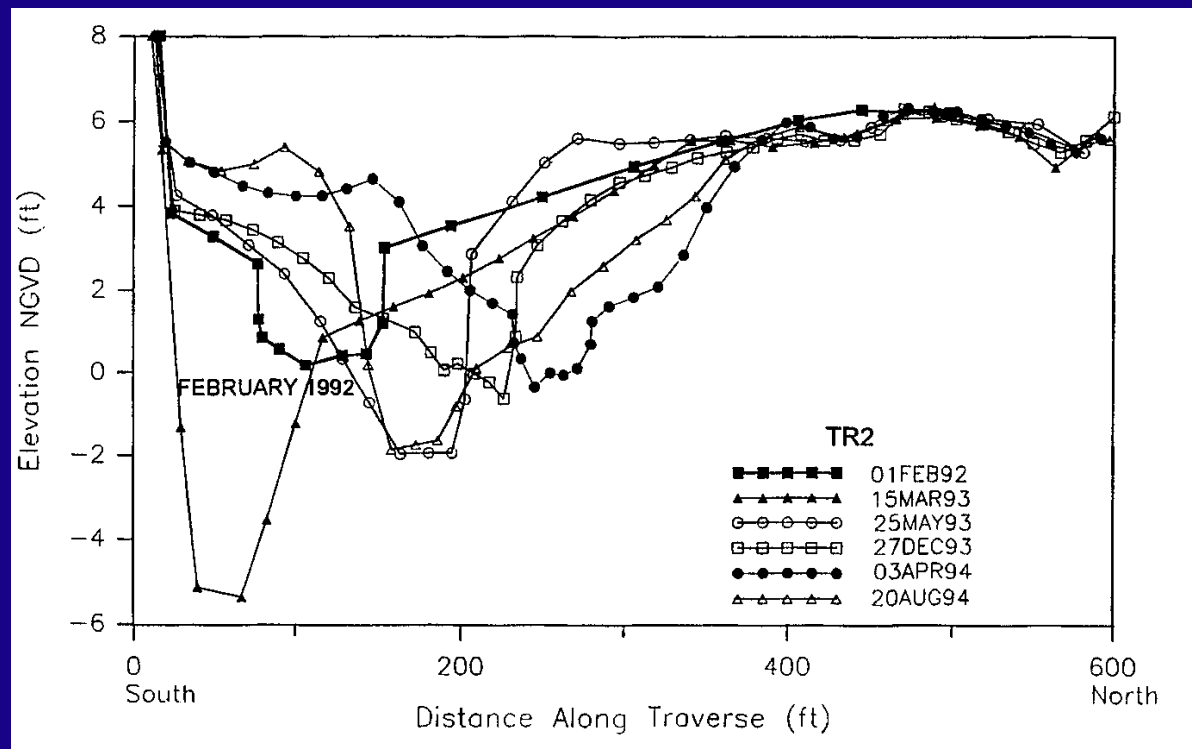


Effect of Artificial Openings of Lagoons on Beaches

Analyzing beach width before and after opening the lagoon artificially, *we found no measurable difference.*



Inlet Cross-Sections (Access)



Inlet cross-section dimensions are -2 to -3 ft and 60 to 80 ft wide at Mean Sea Water Level.

Inlet Area at High and Low Tides



LOW TIDE



HIGH TIDE

NO beach access during high tide.

Effects of Restoration Projects on Beaches and Access

Conclusions Derived From...

1. Numerical modeling,
2. Coastal processes and inlet dynamics,
3. Past restoration project at San Dieguito Lagoon (1980), and
4. Comparison of San Dieguito Lagoon with other local lagoons.

Numerical Modeling

- Numerical modeling is a commonly used method of prediction and gives reasonable estimates of effects and their sizes.
- Dr. Scott Jenkins modeled the effect of the restoration project on beaches and *found no measurable effect.*

Coastal Processes and Inlet Dynamics

- Our lagoons are small and shallow, and they differ from the lagoons on the East Coast, in Mexico, and in North Africa.
- The outflow velocities from our lagoons are small and do not interrupt longshore sand transport.
- Floods play a major role in keeping our lagoons open.
- When a flood occurs, the outflow scours the lagoon channels and erodes adjacent beaches.
- The amount of sand trapped in our lagoons is small compared to the volume of longshore transport.

CONCLUSION: Small Southern California lagoons, such as San Dieguito Lagoon, have no effect on beaches.

Past Restoration Project at San Dieguito Lagoon (1980)

In 1980, U.S. Fish & Game restored 60 acres of “South Basin” *with no noticeable effect on adjacent beaches or inlet channel dimensions.*

Comparison of San Dieguito Lagoon to Other Local Lagoons

- In its existing condition, San Elijo Lagoon has an area larger than the restored San Dieguito Lagoon (1.5 times). However, its inlet channel dimensions are comparable to those of the existing San Dieguito inlet.
- Tijuana Estuary is five times larger than the restored San Dieguito Lagoon. Although its inlet channel is wider than the existing San Dieguito inlet, its depth is more or less similar to that of the San Dieguito Lagoon.

CONCLUSION: The restored San Dieguito Lagoon inlet will not normally be deeper than 2-3 ft mean sea level.

CONCLUSIONS

- Lagoon opening is important to protect biological and economical resources.
- Del Mar beaches undergo large seasonal cycles (150 ft). They are wide in summer and narrow in winter.
- Restoration projects will dramatically enhance water quality, both in the lagoons and in the ocean; prevent health hazards (e.g., mosquitoes, West Nile virus, etc.); and improve aesthetics (odors, etc.).
- Restoration projects will save the lagoons from future biological damage.
- Neither the field data, nor numerical modeling, nor the past restoration project (1980), nor any comparable studies have shown any effect whatsoever of the San Dieguito Lagoon Restoration Project on adjacent beaches or on access.