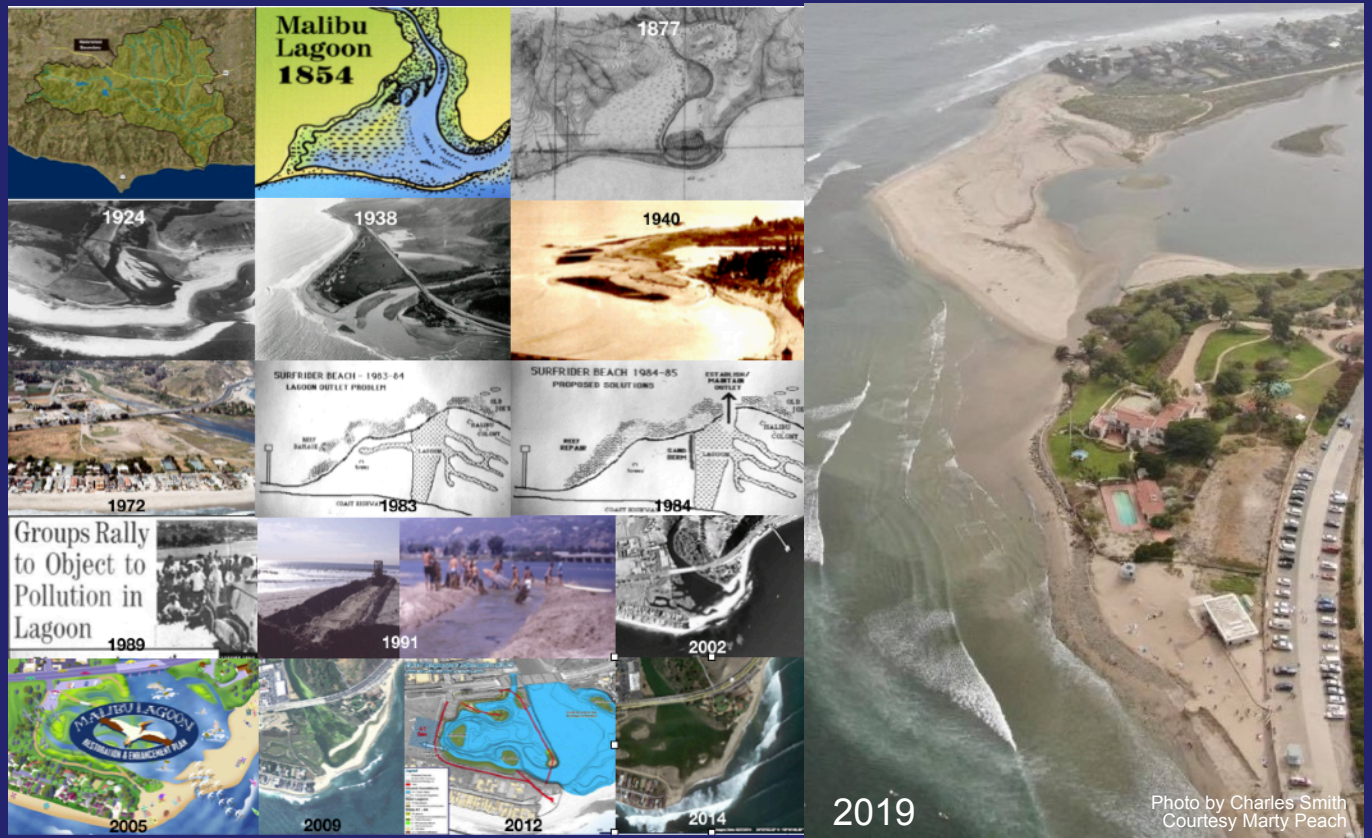
Nature, Man, and Malibu:
A Brief Version of a Very Long Story - Part Two

by Glenn Hening



Introduction

Thanks for taking the time to review a brief collection of facts that may help you form a better understanding of the natural and man-made dynamics that affect Surfrider Beach.

Of course everyone is entitled to their own opinions, and as you go through the information, naturally you still may have more questions than answers.

But my goal is only to provide a brief version of how Nature has created, albeit as affected by Man, an amazing natural wonder: the perfect waves we ride at Malibu.

Now, when we started Surfrider to protect the shape of the wave at 1st Point back in 1984, I was working at the Jet Propulsion Laboratory writing computer code for spacecraft. Today I'm teaching high school math classes. So I like to think I'm capable of separating facts from fantasy - which is important when it comes understanding the problems - and controversies - at Malibu.

This isn't easy when you consider:

- Natural processes that have been going on for thousands of years - and continue to this day;
- How, starting 100 years ago, the Malibu Creek wetlands was transformed forever thanks human intervention (such as the construction of PCH); and
- the nostalgia of older surfers vs the sciences of weather, watersheds, wetlands, and waves.

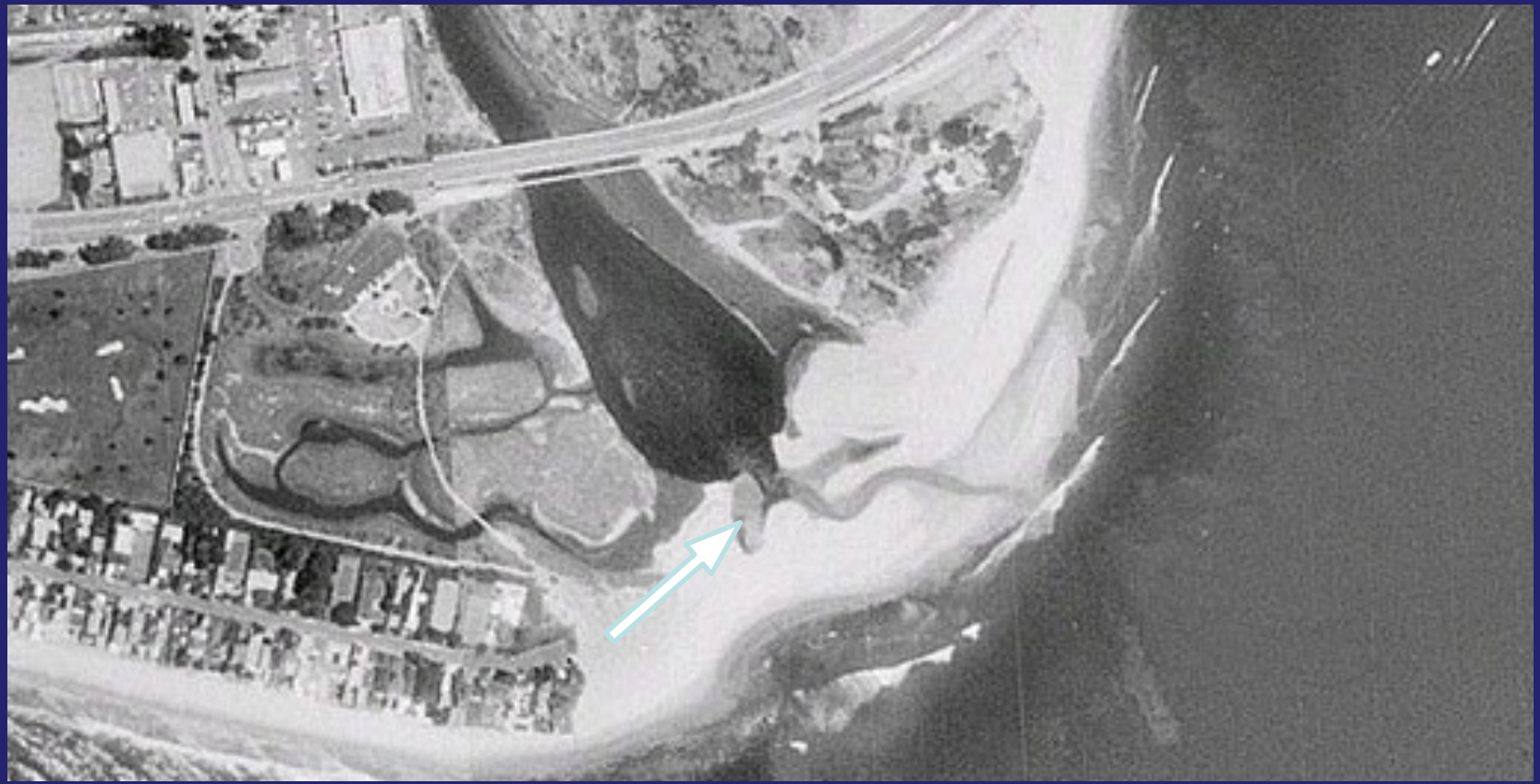
So my presentation is only intended to help simplify some of the complex issues involved - as opposed to my trying to explain in detail what is a very long and complicated story.

Then again, as Lance Carson said in his speech to protect the shape of the wave at the hearing back in 1984, "Malibu is like Old Faithful - a natural phenomenon found nowhere else."

I couldn't agree more. And if we are to honor that idea, and if we are to consider the issues at Malibu properly, we owe it to ourselves to do some clear thinking. This presentation represents my effort to do just that.

Glenn Hening, July 2019

So in 1989, we prevailed upon State Parks to open the lagoon only when the surf was not good and there weren't a lot of people in the water. But the saga continued. Here's a shot from 1994. You can see where the drainage channel was started, but with a wide beach, the channel naturally meandered across to the water.



In 1996 I wrote an extensive article about the situation for the Groundswell Society's annual publication.

Notice the quote in the caption at the bottom of the page with reference to the channels dug back in 1982.

The Park biologist said,

'We should have done it differently, if at all.'

Environmental Case Study

The Lessons of Malibu

Malibu Lagoon State Park: a part of the pollution problems at Surfrider Beach. Notice the curving channels north of the main lagoon. They were gouged out of an existing marsh wetland to "enhance" the appeal of the park. When asked recently about this man-made re-design, the Park biologist said, "We should have done it differently, if at all."

As can be seen, this problems at Malibu involved State Parks officials, Malibu surfers, and the newly formed City of Malibu) all trying to do something about the pollution problems that were making people sick.

In 1996, the permit to drain the lagoon expired, but the lagoon was still suffering from the poorly designed, low-flow channels that resulted in putrid stagnation and contamination of the water - which eventually still drained into the ocean.

The Lessons of Malibu

Chronolgy Of Events
1972 - 1996

1972	Tapia discharge begins to alter lagoon hydrology. Lifeguards have to open a channel across the beach from time to time when Colony residents complain about septic systems backing up.
1976-83	Civic center expansion to include the shopping center, impacts sub-surface water quality and leeching into the water table with large septic systems.
1982-83	Malibu Lagoon enlarged to serve as a bird sanctuary and artificial marshland. (See aerial photo). The channels were designed as part of the new Malibu Lagoon State Park. The Surfrider Beach sign taken down. The park administrator ordered lagoon flushed into the ocean as far from his new parking lot as possible: directly into first point.
1983	First point ruined by heavy rush of lagoon "flush" gouging across the cobblestone bottom. Lance Carson confronts Park officals - gets nowhere.
1984	SF prevails upon State Parks to open the lagoon as close to the Colony as possible.
1986	Studies produce data and water quality testing showing that the lagoon did not comply with public health standards for at least 75% of the tests.
1986	Texaco ordered to pump water out the the ground all around their gas station, filter it, and discharge the "clean" water into the lagoon. (In 1980, Caltrans workers had beeen overcome with gas fumes when doing some repair work on the bridge: Texaco's tanks had leaked and contaminated the soil.
1989	Coastal Commission permits Tapia to expand their discharge from a max of 10 MGD to 16.1 MGD. Reason: "We can't obstruct inland expansion - that's not our job." Permit expires in 1994.
1990	GeoSurf Symposium: first organized effort to establish the facts surrounding the degradation of surfing worldwide and at Surfrider beach in particular.
1990	Major confrontation on the beach with surfers blocking the opening of the Lagoon into the ocean. Parks Chief Dan Preece agrees to surfers' demands for reducing threats to their health be changing lagoon flushing schedule.
1990	GeoSurf health survey: 110 surfers respond with a variety of illnesses reported.
1991	Tapia increases reclamation efforts to reduce discharge. No reclaimed water is discharged into the creek from April through November.
1991	SF meeting w/ Russ Guiney, Lagoon Park administrator. Chapter activists establish a working relationship with the Supt. to solve health problems.
1991	Testing of sand at First Point reveals disease indicators.
1992	Heavy rains increase contamination of Lagoon due to "rinsing" of watershed after several years of drought.
1992	SF meeting w/ John Lewis, Water Quality Control Board member, about stopping the Texaco gas station sub-surface filtration discharge. It won't happen, he says, because some ground water is still contaminated. 6,474,390 gallons going into the Lagoon every 90 days.
1992	Major efforts by Jeff Harris, Environment Now!, Heal the Bay, NRDC: testing and studies, partnership with Tapia in serious testing program
1992	Surfrider Beach changed by winter rains, Creek/Lagoon full all the time due to higher water table and recurrent evening high tides.
1993	Preliminary Watershed Study Group report establishes 103 specific reccomendations for mitigating or eliminating Lagoon health problems.
1994	Malibu surfer gets heart transplant due to contraction of Coxasackie B virus, a disease assocatied with the type of pathogens found in the Lagoon.
1995	Malibu Creek and Watershed Natural Resources Plan is released. Document is the most comprehensive study to date and includes 44 action items.
1996	"Malibu Creek and its Watershed" video is produced and released by Bob Purvey. Video is widely shown on public access TV.
1996	Santa Monica Bay Epidemiological Study is released. Malibu Surfrider Beach is identified as being the most dangerous bathing and surfing beach on a consistent basis of any beach in the bay.
1996	City of Malibu Engineer Rick Morgan proposes a project to manage Lagoon water levels and disinfect dry weather flows in Malibu Creek.
1996	State Dept. of Parks and Rec. permit to open the lagoon into the ocean is allowed to expire. For the first time in 12 yearss, no bulldozers are on the beach opening a drainage trench. Water quality in the surf zone improves drastically according to constant testing done by LA County Health Services.
1996	Malibu Chapter and Surfrider activists include consideration of wetlands reclamantion and marsh forest "technology" to cleanse the Lagoon. As of December, 1996, solutions to the health problems at Malibu are definitely on the horizon.

There were a lot of players in the process from the Coastal Commission to politicians to regulatory agencies, surfers, swimmers, and, of course, the newly formed Malibu chapter of the Surfrider Foundation.

Environmental Case Study

The Lessons of Malibu

Studies and Documentation Organizations and Individuals

1986 Topanga Las Virgenes Resource Conservation District studies of the Lagoon by Jean Dillingham and Sean Manion
1987 Study of Creek and Lagoon by Gearhardt
1989 Identification of Pathogenic Viruses that survive tertiary sewage treatment by Grimes, Gerba, et al.
1989 Data regarding reduced bio-diversity in SM Bay by Dr. Rimmon Fay
1990 Pathogens and Indicators in Storm Drains in SM Bay by Mark Gold et al. prepared for the Santa Monica Bay Restoration Project
1992 Preliminary reports by the Malibu Watershed Study Group, chaired by Coastal Commissioner Madelyn Glickfeld
1992 Environment Now! studies on the beach at Surfrider
1992 Malibu Wastewater Study by Peter Warshall
1993 UCLA study on pesticides and heavy metals in the Lagoon
1993 State-of-the-art testing by Tapia, NRDC, Environment Now!, Heal the Bay
1995 Epidemiological Study of Santa Monica Bay
1995 Malibu Creek Watershed Natural Resources Plan

Organizations

Calif Coastal Commission - permits for Tapia, lagoon expansion
Calabasas, Westlake Village, Agoura - urban run-off
Environment Now! - Tapia water testing, pathogen study
Heal the Bay -Mark Gold, testing, 1992 Beach report, pathogen study
LA County Health Services - Jack Petralia
LA County Beaches and Harbors - responsible for beach closures, signs
Malibu City Council - 1992 resolution re Tapia, is aware of problem
Malibu Bay Company - largest commercial owners in the alluvial plain
Malibu City Council Waste Water Task Force - advises City Council
Malibu Creek Shopping Center - doesn't treat wastewater
Malibu Colony Homeowners - complain about septics backing up
Malibu Civic Center - doesn't treat own wastewater
National Resources Defense Council - study in 1992
Peter Warshall and Associates - comprehensive study -
1992 Santa Monica Bay Restoration Project - study 1992
Save Our Coast - started pathogenic focus on Malibu beaches
Senator Gary K. Hart - initiated Watershed Study Group
Serra Road Home owners - suffer from black flies;
State Regional Water Quality Control Board - directly involved with the Texaco filtration discharge
State Parks and Recreation - Dan Preece, Russ Guiney opened the lagoon from 1984 through 1996
Tapia Wastewater Reclamation Facility - largest contributor to creek
Topanga Las Virgenes Resource Conservation District
Sean Manion and Jean Dillingham produce studies for the District.

Individuals

Dr. Jeff Harris, Lance Carson, Tom Pratte, John Baker, John Renault, Paul Minkoff, George Carr, Janet McPherson, Bill and Fini Littlejohn, Allen Sarlo, Mary Frampton, Steve Woods, Jo Ruggles, Bob Purvey, Nancy Downes, Kim Martin, Rick Morgan, Angie Reno, John Van Hamersveld,, Zuma J, Mike Pierson, Joe Sanders, Mario Quiros, Glen Kennedy, Dru Lewis, Nick Kaeller, Debbi Tappis, Melanie Trivette, David Saltman, Scot Dittrich, John Hearne, Tuck and Jeryll Taylor, Lance Woleslagle, and - - -

those local activist surfers ready to implement their own lagoon management plan as necessary.

The Malibu chapter of Surfrider never backed down during these years, and held a conference at Pepperdine where we heard from all the major players, including State Parks officials.

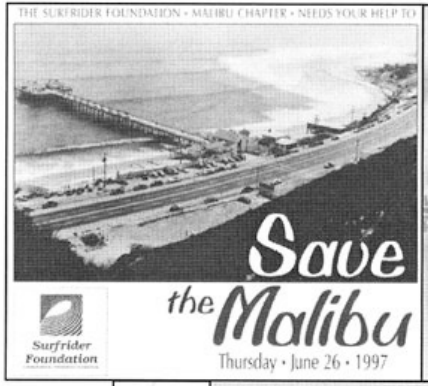
This was the beginning of a serious effort to do something about the pollution in the lagoon. To get it right this time, State Parks had to really think through how to restore Nature's balance to Malibu.

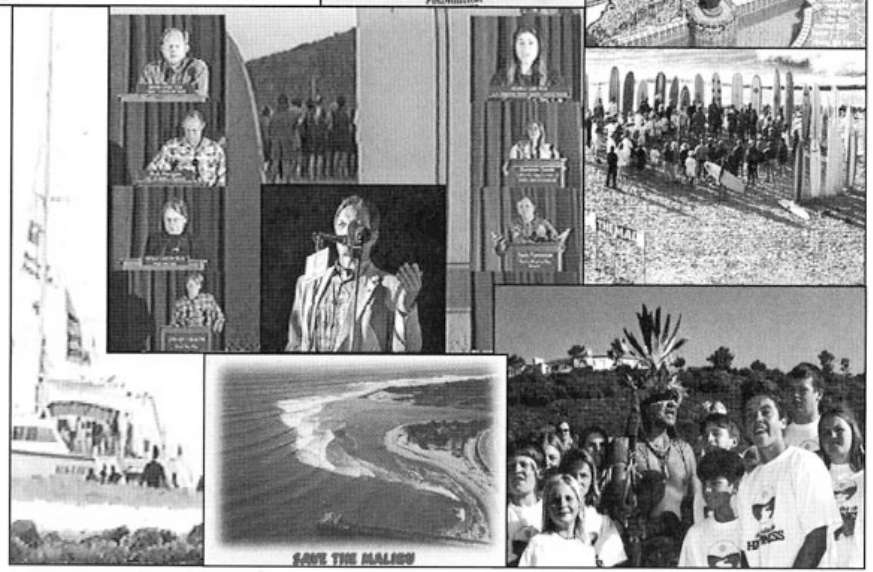
Organizations

Saving the Malibu:
Facts and Fundraising
1997-1998
Surfrider-Malibu

In 1997 the Malibu Chapter of the Surfrider Foundation organized a first-ever day of events intended to focus attention on the health problems at Malibu. Included were a healing circle/paddle-out on the beach, a conference on watershed issues at a local junior high, and a fundraiser at the museum on the point at Malibu. Although a lot of consciousness was raised in the morning, and $10,000 was raised at night, just as important was the establishment during the day of a specific set of positions and action plans on the part of the numerous public agencies charged with management of the watershed, creek, lagoon, and surf zone.

Again in 1998 the chapter organized another "Save the Malibu" day, starting with an authentic Chumash ceremony on the sand conducted by Mati Waiya, a member of Surfrider's Board of Advisors. This year the conference was held at Pepperdine University, and the fundraiser also upped the ante, raising over $20,000. The all-day conference provided an opportunity to evaluate the effectivenss of the participating agencies by comparing last year's promises with this year's results in resolving the health threats to surfers at Surfrider Beach. In addition, several new presenters brought their perspectives and initiatives into focus for the first time as a part of the Chapter's efforts to solve the pollution problem at Malibu.





And given how all these streams eventually bring water - and sand - down to the ocean, important considerations included rainfall patterns, storm intensity and duration, and droughts and their direct affect on the lagoon, the shoreline, and the waves.

This fundamental fact may help explain why the inside cove at Malibu is sand-starved in 2019.

This chart shows rainfall amounts in LA County - and is a good indicator of why Malibu is sand-starved in 2019. This past winter, there was a good amount of rain (as there was two years ago), but nothing like 1969, or 1983, or 1998, or other peak years.

And in between the good rainy winters, we had significant droughts.

And remember, if it isn't raining, then the mountains aren't being slowly eroded - and no sand or rocks are coming down the streams and Malibu Creek to the ocean.

Of course, the waves keep breaking, so long-shore sand transport (again, think Dr. Inman's "river of sand") means that the sand at our beaches, if not replenished, is either eroded by waves or trapped in littoral cells (think Venice Beach up to Santa Monica beach widening thanks to the Marina Del Rey breakwater.)

Season (July 1-June 30)	Inches of Rainfall	Above/Below (+/-) Season Average*
2018-2019	16.94	+5.23
2017-2018	3.87	-7.84
2016-2017	16.33	+4.62
2015-2016	9.41	-2.30
2014-2015	7.45	-4.26
2013-2014	4.45	-7.26
2012-2013	6.89	-4.82
2011-2012	7.61	-4.10
2010-2011	17.85	+6.14
2009-2010	12.42	+0.71
2008-2009	8.13	-3.58
2007-2008	10.24	-1.47
2006-2007	2.63	-9.08
2005-2006	10.89	-0.82
2004-2005	26.51	+14.80
2003-2004	8.61	-3.10
2002-2003	10.38	-1.33
2001-2002	4.16	-7.55
2000-2001	15.56	+3.85
1999-2000	10.11	-1.60
1998-1999	9.27	-2.44
1997-1998	31.28	+19.57
1996-1997	13.30	+1.59

June 2002 -
A rare shot of two partial breaching of the “berm”. In neither case did it break through and the lagoon looks quite full.
This was in June after a “drought” winter with only 4” of rain.

August 2002 -
Apparently there’s extremely dense algae, especially in the artificial channels dug in 1982-83. The influence of the stagnant water in the artificial channels is a possible cause for the algae “bloom” in the main channel.

Dec. 31, 2002:
The lagoon finally broke through and deposited what appears to be quite an “alluvial fan” at 1st Point.

But this kind of radical change was a consideration when evaluating how to manage the lagoon when, in 2002, it was decided to try and restore the lagoon to eliminate the low-flow channels that created putrid dead-zones of stagnation in the lagoon waters and subsequent pollution of the ocean.

In 2005, the first cut at a plan to solve the pollution problems at Malibu was published. This began a process that lasted for almost six years.

There were stakeholder meetings, public hearings, regulatory agency reviews, revisions, new research, and what seemed like an endless effort to find a solution that would work for every stakeholder.

This was a very public process, and one of the first changes was to realize that the artwork at right was not an accurate picture of what eventually would work.

Note that both the Coastal Conservancy and Heal the Bay were integrally involved in the restoration plan.

Dec. 31, 2005:

In the meantime, the surf rolled on and the lagoon continued to pollute the ocean.

Here's a good example of what happens when winter's extreme high tides and a short period winter swell can push ocean water back into the lagoon through the natural outlet.

Just as important is how winter swells sweep down the point at an angle that pushes sand into the cove from out at 3rd Point.

This means that beach replenishment in the cove depends on rain and swells so that the longshore sand transport process (the "river of sand") will flow sand down into the cove.

March 2006 -
After a winter of drought, though with above average rain the previous winter. A lot of sand had been deposited along the beach, and the lagoon channels are almost dry since they were blocked off by sand coming down the creek from the watershed the previous winter.

December 2006 -
Nine months later - and the beach is completely different. This is a good example of how the beach is always changing. (The scientific term is “morphology”.)
Note the extreme algae down in front of the Adamson House.

January 2008 -
In the middle of a drought year. The channels appear almost completely dry, while the lagoon outlet has meandered toward the pier.

December 2008 -
This image shows just how much the beach can change over the course of the year even without the affects of the artificial channels. Note the extreme meandering of the lagoon outlet - as well as the extensive algae.

April 2011:
The rains of 2010-2011 had been above normal, but came after five years of drought. So a lot of early rains soaked into the watershed, though it appears a lot of sand eventually did come down the creek. Once again, note the meandering outlet of the lagoon.
This image could be interpreted to indicate that drought years have a significant affect on the creek flow, even after an above-normal rainy season.

2011 - Back to the Lagoon Restoration project:

Here's a graphic showing a requested alternative that was finally adopted.

As can be seen, there are no narrow channels, all the landfill is gone, and a wide open area was approved by all the major stakeholders.

And although surfers were definitely a part of the process, the primary consideration was undoing the damage done in 1982-83 - and to provide a coastal habitat for migrating birds, native plants, and wetlands aquatic species.

All these agencies were involved in the final approval of the plan to restore the lagoon to the best possible version of a wetlands.

Note the LRWG: a number of local surfers were members and consistently spoke up for the surfing community.

AMSL	above mean sea level
AQMP	Air Quality Management Plan
basin plans	water quality control plans
BMPs	best management practices
Caltrans	California Department of Transportation
CARB	California Air Resources Board
CCC	California Coastal Commission
CDFG	California Department of Fish and Game
CDP	Coastal Development Permit
CEQ	Council on Environmental Quality
CEQA	California Environmental Quality Act
CESA	Endangered Species Act
CGS	California Geological Survey
City	City of Malibu
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
CO	carbon monoxide
Coastal Conservancy	State Coastal Conservancy
Corps	U.S. Army Corps of Engineers
CRHR	California Register of Historical Resources
CWA	Clean Water Act
DPR	California Department of Parks and Recreation
EIR	Environmental Impact Report
EPA	Environmental Protection Agency
ESHA	Environmentally Sensitive Habitat Area
FAC	facultative plants
FACW	facultative wetland plants
FEMA	Federal Emergency Management Agency
FESA	Federal Endangered Species Act
IUCN	International Union for Conservation of Nature a
LARWQCB	Los Angeles Regional Water Quality Control Bo
LCP	Local Coastal Program
LRWG	Lagoon Restoration Working Group
LTAC	Lagoon Technical Advisory Committee
LUP	Land Use Plan
msl	mean sea level
MMRP	Mitigation Monitoring and Reporting Program
NAHC	Native American Heritage Commission
NO_2	nitrogen dioxide
NOP	Notice of Preparation
NPDES	National Pollutant Discharge Elimination System
OBL	obligate wetland plants
OHP	Office of Historic Preservation
OS	Open Space
PCH	Pacific Coast Highway
plan or project	Malibu Lagoon Restoration and Enhancement Plan
PM_{10}	particulate matter 10 microns in diameter or less
PRC	Public Resources Code
RCDSMM	Resource Conservation District of the Santa Monica M
ROC	reactive organic compound
ROW	right-of-way
RPAs	Resource Protection Areas
RWQCB	Los Angeles Regional Water Quality Control Board
SCAG	Southern California Association of Governments
SCAQMD	South Coast Air Quality Management District
SMARA	Surface Mining and Reclamation Act
SO_2	sulfur dioxide
SWPPP	stormwater pollution prevention plan
SWRCB	State Water Resources Control Board
TMDL	total maximum daily load
USEPA	United States Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
WDR	Waste Discharge Requirement

2011 -
The Lagoon Restoration Project was finally approved by the Coastal Commission. However, please take a look at all the special conditions attached to that approval. It was a very complicated project to begin with, but even after it was approved, there are significant challenges to make it work as envisioned.

We should note that in 2019, all the special conditions listed below were addressed.

SUMMARY OF STAFF RECOMMENDATION

Staff recommends **APPROVAL** of the proposed project **with seventeen (17) special conditions** regarding: (1) Construction, Timing, and Sensitive Species Surveys, (2) Erosion Control Plans, (3) Timing, Operations, and Maintenance Responsibilities, (4) Final Dewatering Plan, (5) Final Hydrological Monitoring Plan (6) Habitat (Plant Communities) Vegetation, Restoration Monitoring and Reporting Plan, (7) Final Aquatic Vegetation, Benthos, Fish and Avian Monitoring Plan, (8) Plans Conforming to Engineer's Recommendations, (9) Herbicide Use, (10) Final Public Access Program, (11) Required Approvals, (12) Assumption of Risk, (13) Discharge Requirements, (14) Mitigation Measures, (15) Archaeological Resource Monitoring, (16) Removal of Excavated Material, and (17) New Zealand Mud Snail Measures.

August 2012 -

The lagoon restoration project underway. First they had to block off the project area, and then dig out the entire landfill through which the channels had been carved.

Over 100 truckloads of construction debris, including concrete and asphalt, had to be removed, along with years of accumulated trash until the area was completely cleaned out.

December 2013 -
The lagoon restoration project completed, though after two years of drought there was very little water coming down the creek.
The outfall shown was not bulldozed - it is possible that the extra water in the restoration area contributed to the outfall location.
So for those who contend that the Restoration Project affects the outlet, this image suggests that the current lagoon setup might benefit surfers - and the beach, too.

August 2014 -
During a good swell there's no apparent change in the shape of the wave due to the lagoon restoration project.

The beach does look very narrow - which is to be expected since this was after a very dry winter (only 4.5 inches of rain), and the previous two rainy seasons were also significantly below normal.

May 2015 -
The Lagoon Restoration area looks much better than it would if the old channels were still existent, while the main channel appears to be undergoing a significant algae event.

Note the outlet meandering towards the pier.

As for rainfall, the previous winter was again significantly below normal.

Good examples of how the beach changes (morphology) during the year. Note that the 2015-2016 winter rains were below normal. It was the fifth year in a row of below normal rains.

Feb. 2016

Oct. 2016

Oct 2017 -
The winter rains of 2016-2017 were above normal, but much of the rain soaked into the dried out watershed and not a lot of sand came down the creek.
There doesn't appear to be a lot of algae build up - which was one of the goals of the restoration project.

Dec 8 2017 -
Looks like the lagoon naturally opened up in front of the Adamson House and drained the lagoon to a certain extent.

Dec 31 2017 -
The outlet has continued to meander, and the water level in the lagoon has dropped a bit.

2018-2019 -
This chart is shows rainfall amounts in LA County. It seemed like a rainy winter, but nothing like 1969, or 1983, or 1998, or other peak years.
But there's another important set of factors to consider:

- how much rain from the initial storms simply soaked into the drought-starved land;
- How long did a particular storm last and how much rain fell in the Malibu Creek watershed;
- How intense was the storm, and thus the intensity of the rain eroding the Santa Monica Mountains;
- How much sand and rock did or didn't come down to the beach;
- What was the winter surf like: if there are short period storm surf, then the sand is dispersed and doesn't have a chance to form a coherent sandbar, much less a smooth delta; but
- If there are long period NW swells, then the sand can be swept along the shore - and the waves can be that much better at Malibu.

Month	Rainfall Measured	Monthly Normal*
July 2018	0.00	0.03
August 2018	0.00	0.05
September 2018	0.00	0.21
October 2018	0.58	0.56
November 2018	2.09	1.11
December 2018	1.45	2.05
January 2019	5.52	2.71
February 2019	4.42	3.25
March 2019	2.10	1.85
April 2019	0.05	0.70
May 2019	0.73	0.22
June 2019	Trace	0.08

November 2018 -

The previous winter rains were well below normal, so it looks like the lagoon never did empty into the ocean - and slowly filled up over time.

This image also shows how the Adamson House (formerly the Rindge mansion built in 1929 after the dam changed the flow of the creek into the wetlands) was built on what used to be part of the wetlands.

As seen on the previous slide, during the winter of 2018-2019, rainfall was slightly above average, though after a drought year much of the rain soaked into the watershed.

In addition, the storm patterns were somewhat inconsistent, as was the sand replenishment process.

June 2019 -

Thanks to Charles Smith, we have this drone image taken right when the erosion issues in the cove became quite unusual.

It was this situation that prompted many surfers to become very concerned about “their” beach. They began to point fingers at State Parks, the Lagoon Restoration Project, etc. while worrying that Malibu as they know it would be destroyed forever.

However, it must be remembered that there are very large scale forces at work, starting with storms in the North Pacific that bring us rain, the size of the watershed, years of drought, not to mention the blocking of the creek by development in the creek plain.

Some of these factors go back thousands of years, some decades, and some not that long ago.

But to truly understand the situation requires a very broad perspective and a lot of research and willingness to learn.

I hope my brief version of a very long story will provide a basis for rational, informed thinking about Nature and Man as we again surf the great waves at Malibu this summer.

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End of Part Two