moffatt & nichol

Southern Shores Seek Sand Solutions

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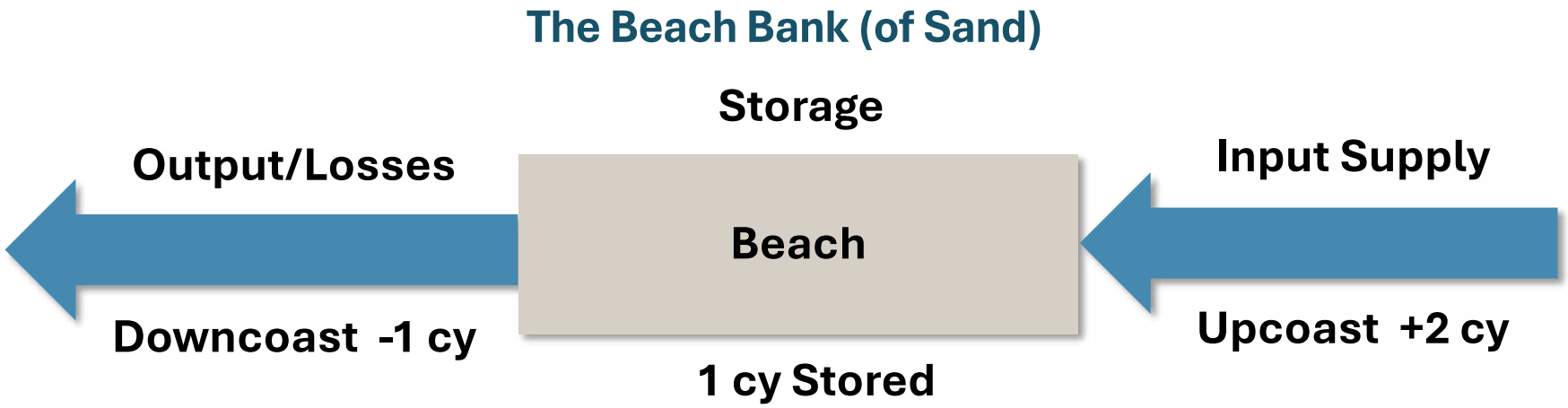
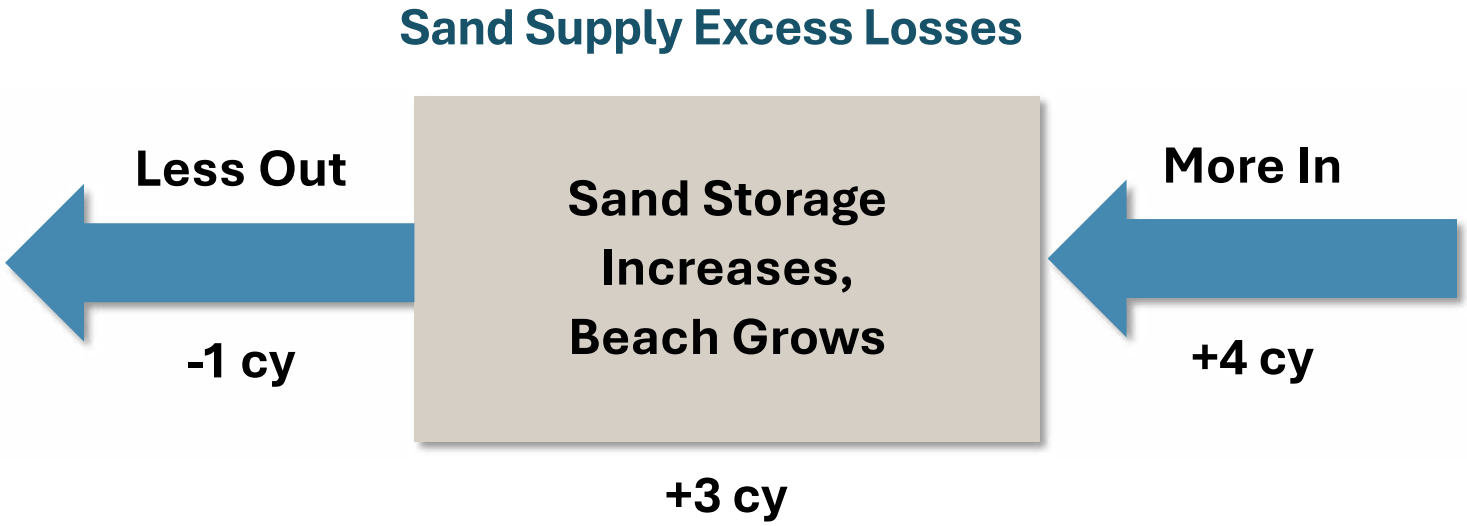
May 12, 2026

You Are Here
Point Conception
Southern California
Mexico
WYOMING
Salt Lake City
NEVADA
UTAH
COLORADO
San Francisco
CALIFORNIA
Las Vegas
Los Angeles
NEW MEXICO
Phoenix
San Diego
Tucson
BAJA CALIFORNIA
SONORA

Definition of Beach Nourishment:

› Adding new sand to the beach from outside of the existing targeted littoral cell





Southern California Bight

Large embayment & uneven coast
+ Island sheltering of waves
+ Wider continental shelf
+ Sand sources

= Wider beaches

Southern California Bight

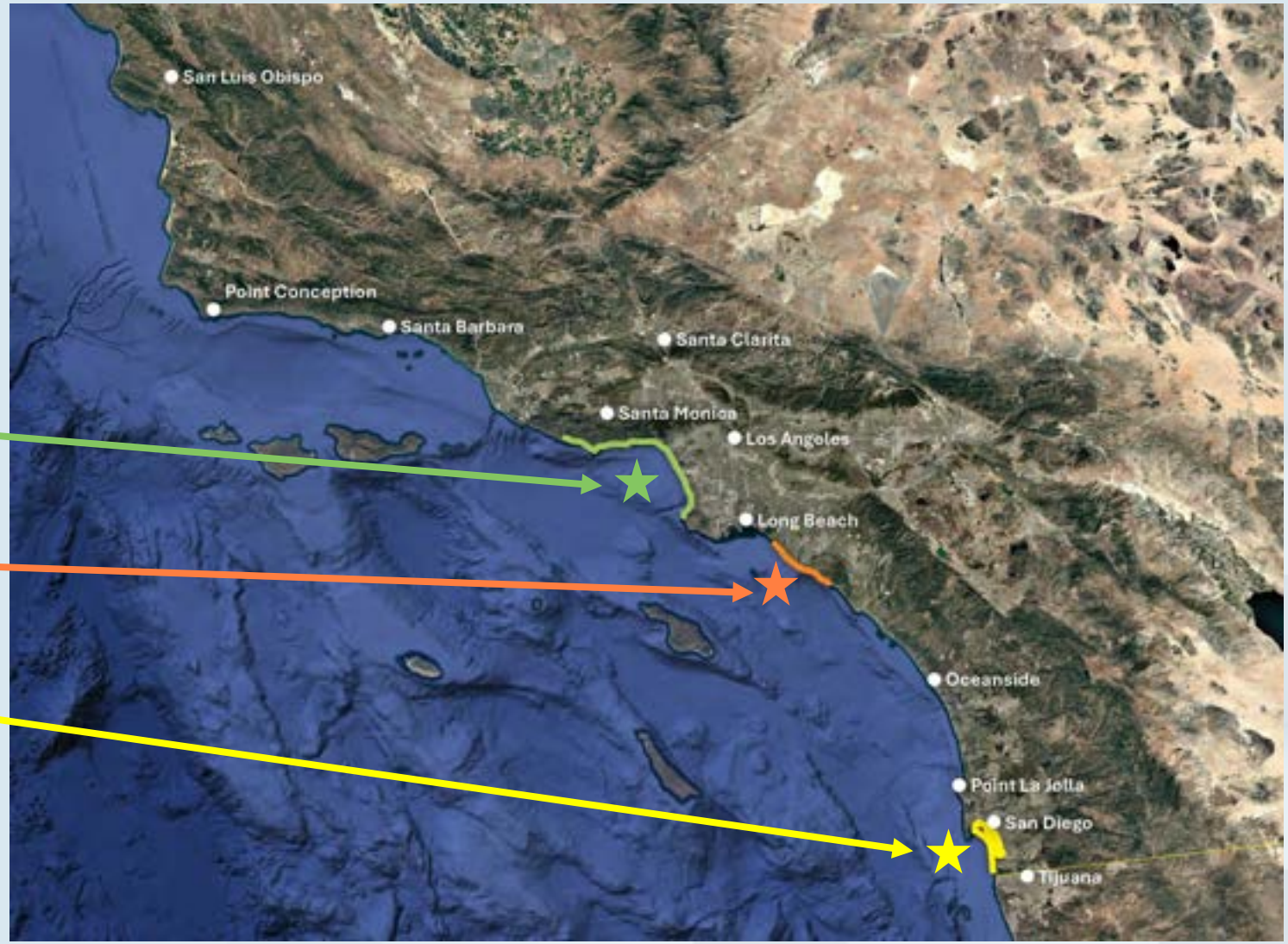
Warm air
+ Warm water
+ Dense population
+ Wider beaches

= Economic benefits $$$

Southern California Littoral Cells (Patsch & Griggs 2006)

Examples of Successful Nourishment

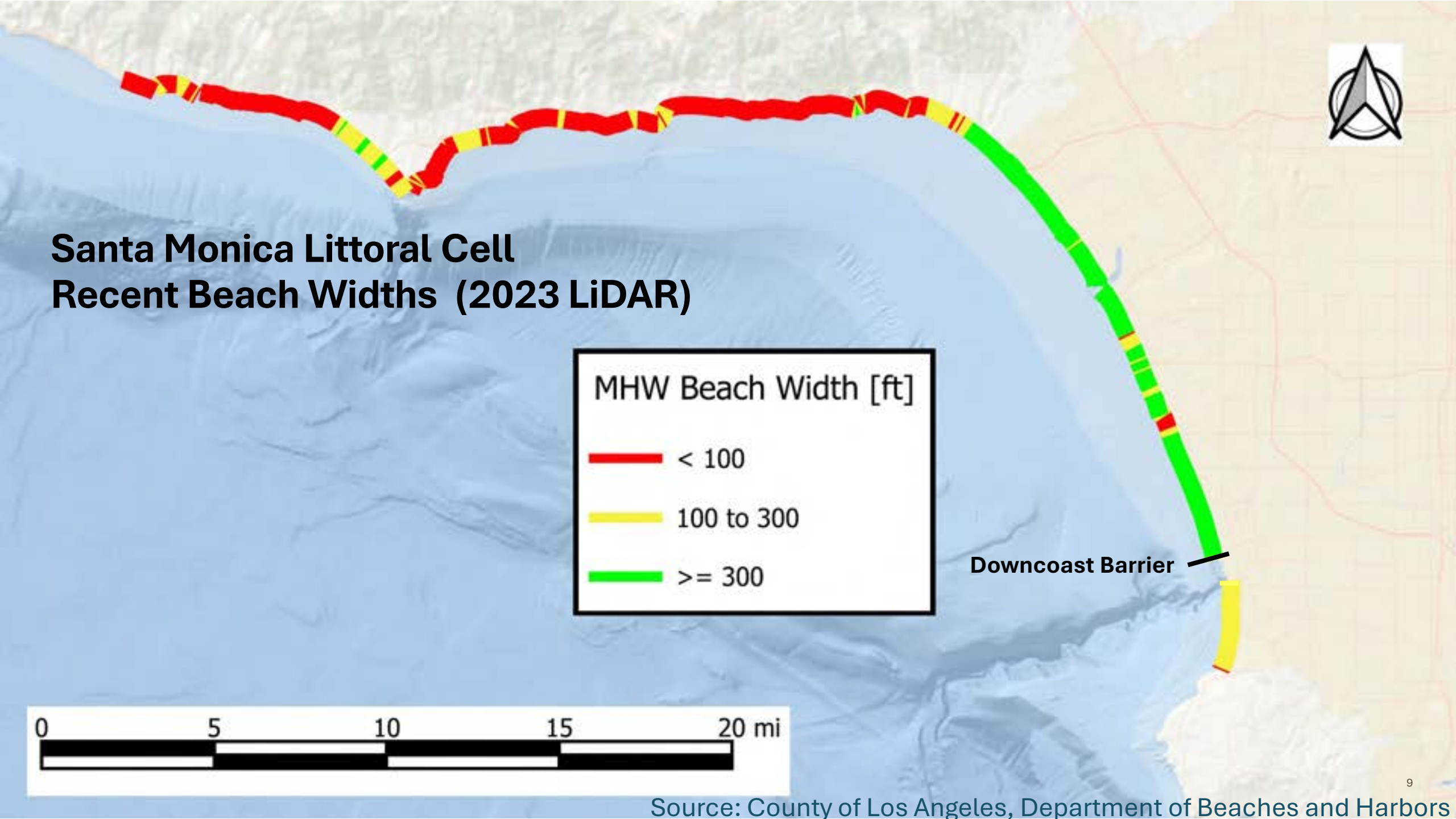
- Santa Monica Bay
- North Orange County
- Silver Strand in South San Diego County



Santa Monica Bay – Unintentional but Effective (LACDBH)

Source: County of Los Angeles, Department of Beaches and Harbors

Santa Monica Littoral Cell
Recent Beach Widths (2023 LiDAR)



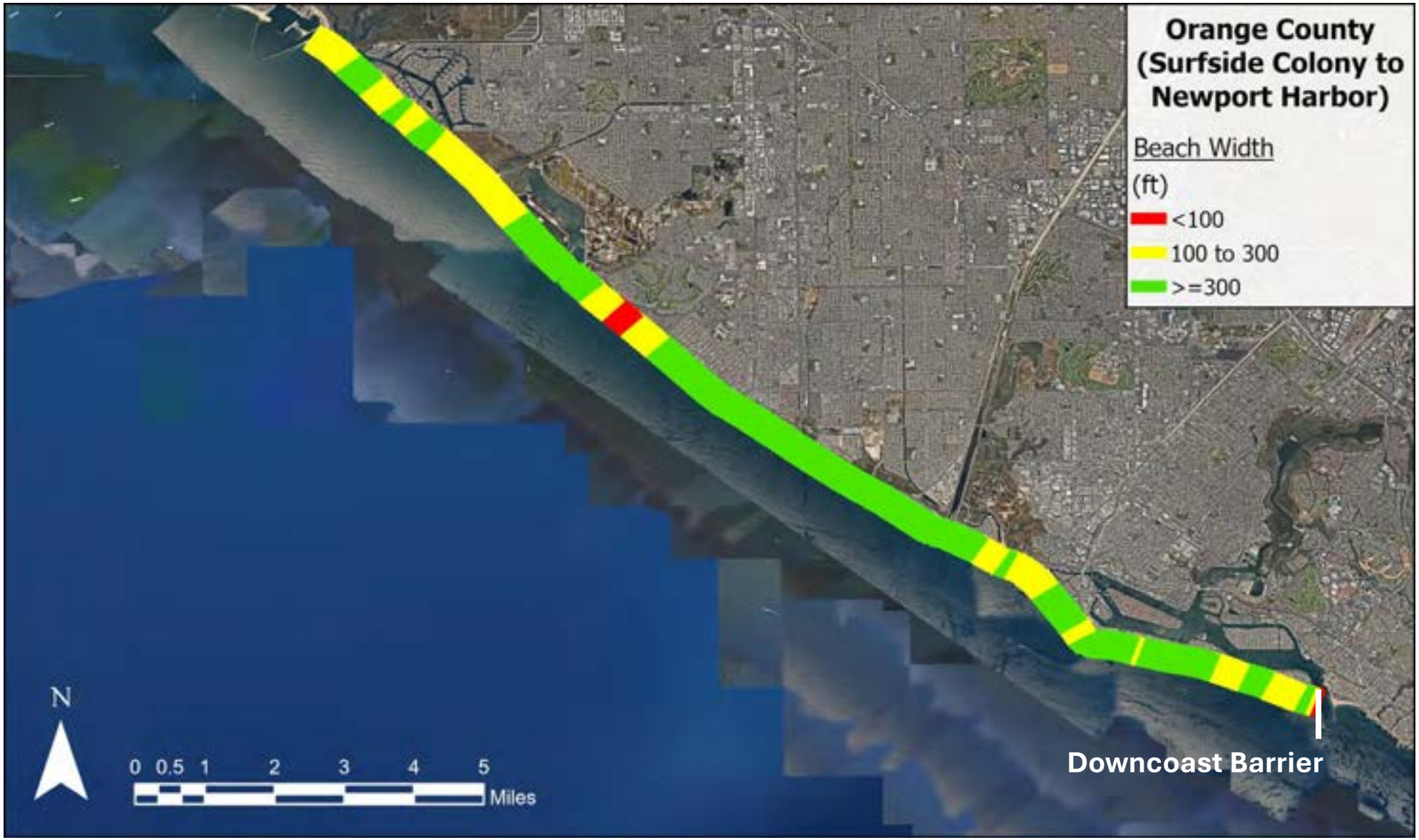
Source: County of Los Angeles, Department of Beaches and Harbors

North Orange County – Intentional

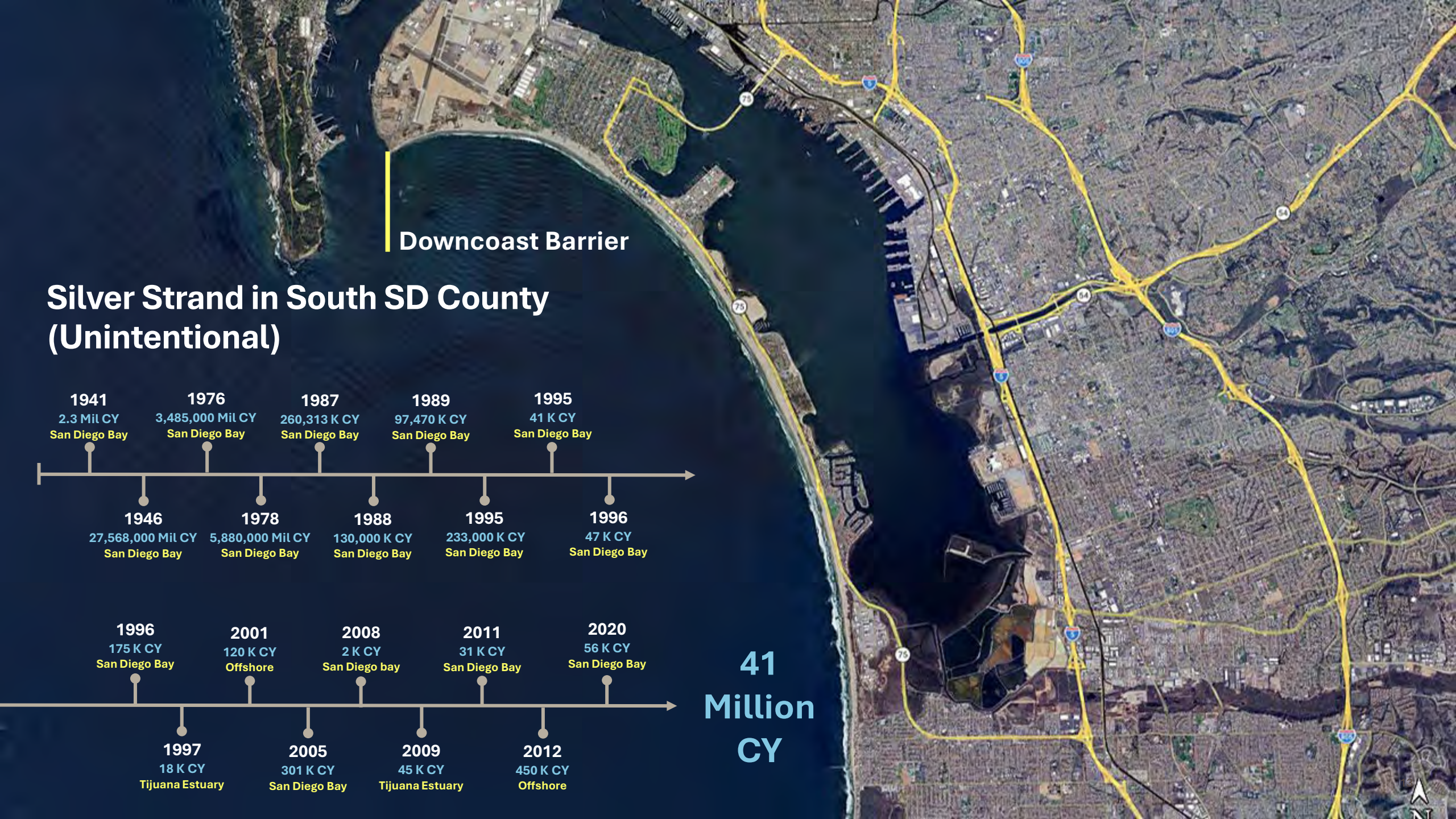
1919-1946	1964	1965	1966	1967	1968	1969	1970	1971	1973	1979	1983	1990	1992	1997	2005	2009	2016	2025
7,846,000 Mil CY	4.0 Mil CY	124 K CY	60 K CY	150 K CY	741 K CY	1,625,000 Mil CY	124 K CY	2.3 Mil CY	358 K CY	1.6 Mil CY	550 K CY	1.8 Mil CY	1.3 Mil CY	1,740,000 Mil CY	90 K CY	1.0 Mil CY	750 K CY	900 K CY
Newport Bay	Offshore of Surfside/Sunset	Newport Harbor	Newport Harbor	Newport Harbor	Santa Ana River	Offshore of Surfside/Sunset	Santa Ana River	Offshore of Surfside/Sunset	Santa Ana River	Offshore of Surfside/Sunset	Santa Ana River	Offshore of Surfside/Sunset	Santa Ana River	Offshore of Surfside/Sunset	Santa Ana River	Offshore of Surfside/Sunset	Santa Ana River	Offshore of Surfside/Sunset

27 Million CY

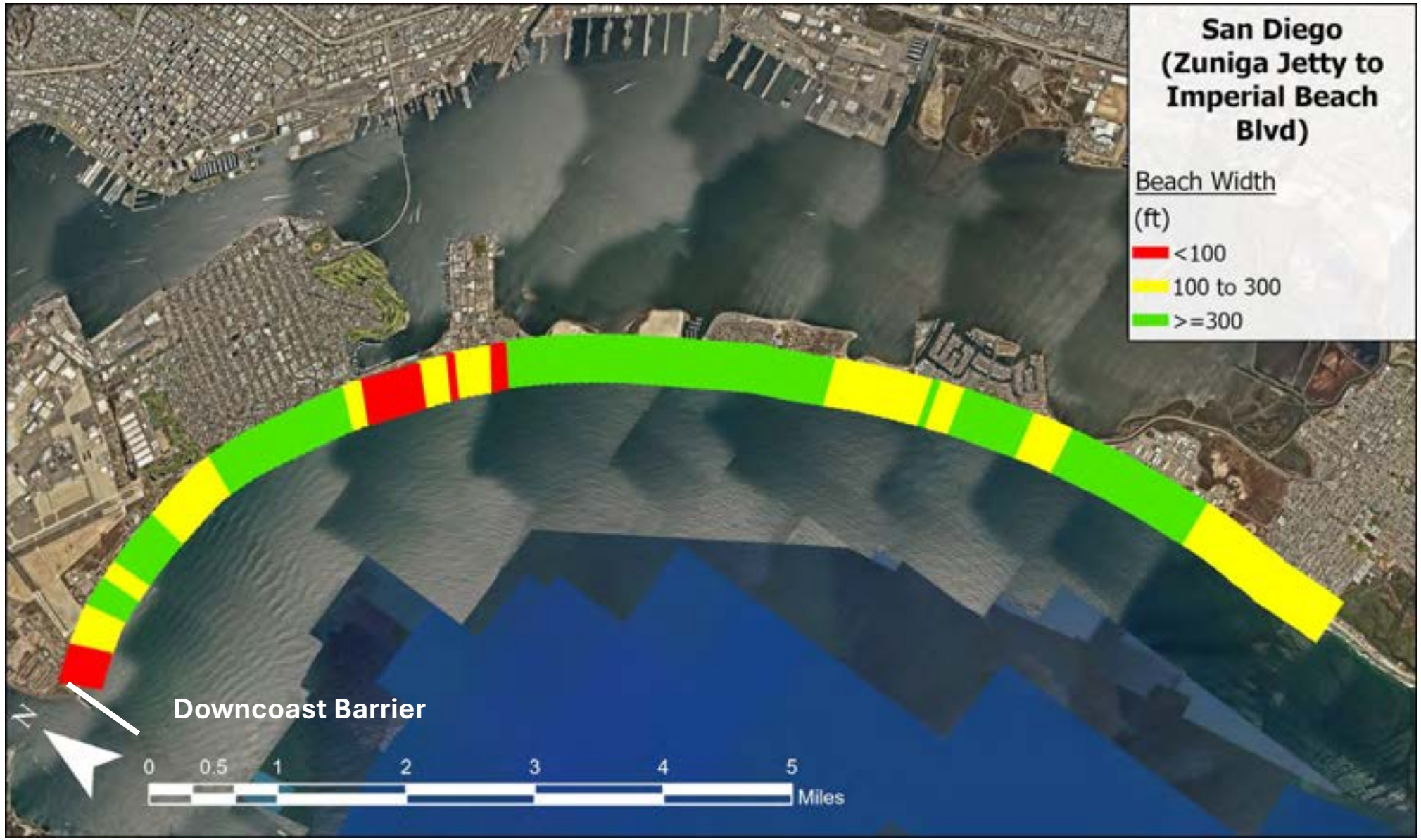
San Pedro Littoral Cell | Recent Beach Widths (2023 LiDAR)



Newport Beach


Downcoast Barrier
Silver Strand in South SD County (Unintentional)
1941
2.3 Mil CY
San Diego Bay
1946
27,568,000 Mil CY
San Diego Bay
1976
3,485,000 Mil CY
San Diego Bay
1978
5,880,000 Mil CY
San Diego Bay
1987
260,313 K CY
San Diego Bay
1988
130,000 K CY
San Diego Bay
1989
97,470 K CY
San Diego Bay
1995
233,000 K CY
San Diego Bay
1995
41 K CY
San Diego Bay
1996
47 K CY
San Diego Bay
1996
175 K CY
San Diego Bay
1997
18 K CY
Tijuana Estuary
2001
120 K CY
Offshore
2005
301 K CY
San Diego Bay
2008
2 K CY
San Diego bay
2009
45 K CY
Tijuana Estuary
2011
31 K CY
San Diego Bay
2012
450 K CY
Offshore
2020
56 K CY
San Diego Bay
41 Million CY

Silver Strand Littoral Cell | Recent Beach Widths (2023 LiDAR)



North San Diego County
1954
3.0 Mil CY
Agua Hedionda Lagoon
1962
3.8 Mil CY
Oceanside Harbor
1981
920 K CY
Southern Camp Pendleton
1994
1.8 Mil CY
Batiquitos Lagoon
1995
40 K CY
Santa Margarita River
1995
20 K CY
Carlsbad Development
1996
5 K CY
Encinitas Development
1997
54 K CY
Lomas Santa Fe Drive
1997
172 K CY
San Diego Bay
1998
1 K CY
Arizona
1998
560 K CY
Agua Hedionda Lagoon
2001
1,833,000 Mil CY
Offshore
2001
1 K CY
Quarry to Encinitas
2002
1 K CY
Quarry to Encinitas
2009
40 K CY
Encinitas Development
2010
5 K CY
Scripps Parking Garage
2011
1,500 K CY
Saxony Detention Basin
2012
1,082,000 Mil CY
Offshore
2018
450 K CY
San Elijo Lagoon
2019
40 K CY
Encinitas Development
2021
67 K CY
San Elijo Lagoon
2021
21 K CY
Solana Beach Development
2024
1,049,000 Mil CY
Offshore
15 Million CY
Downcoast Sink (Canyon)

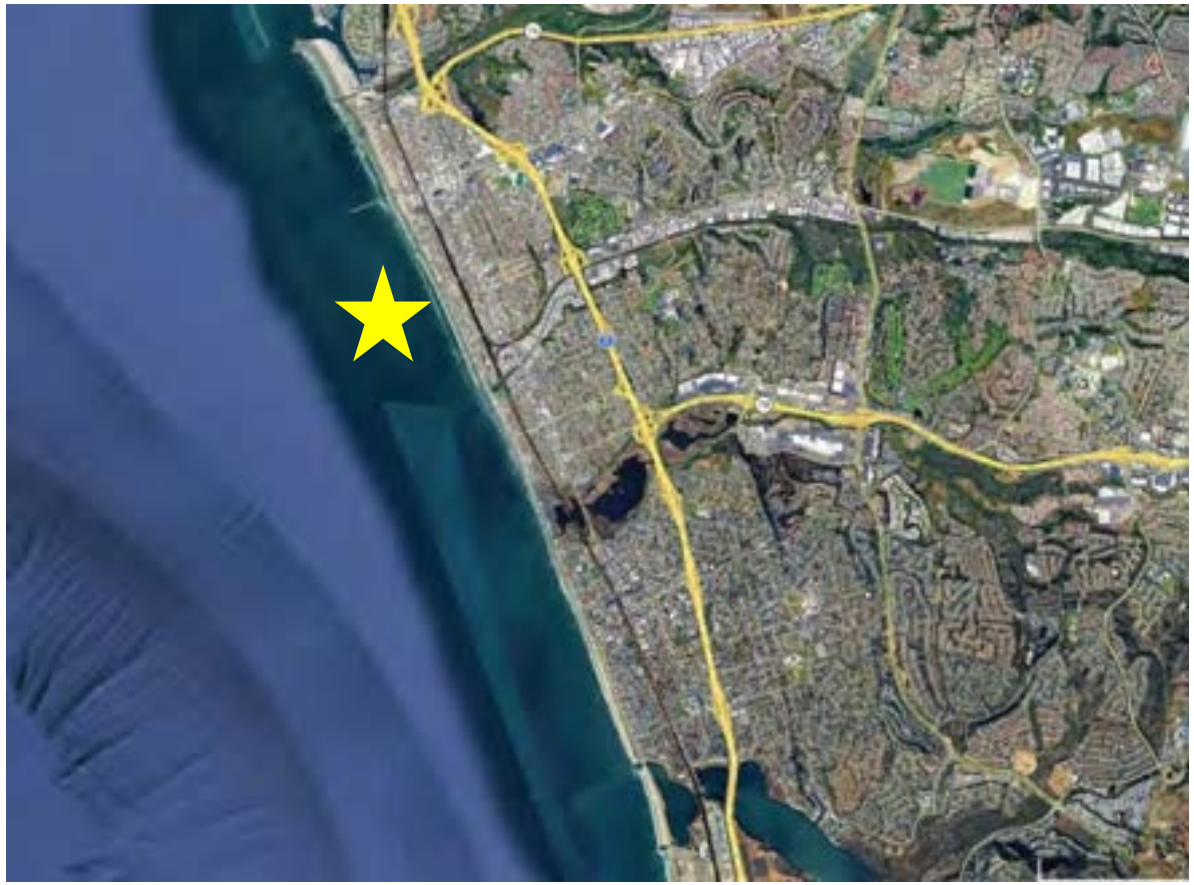
Oceanside Littoral Cell | Recent Beach Widths (2023 LiDAR)

Status

- **Success depends on:**
  - Regional Approach
    - Feeder beaches, large quantities over long reaches during long time periods
  - Benefits of a downcoast terminal structure
  - Coarse sand remains longer than fine sand
- **Lack of success depends on:**
  - Insufficient sand supplies over time
  - A porous downcoast boundary
  - Relatively fine sand

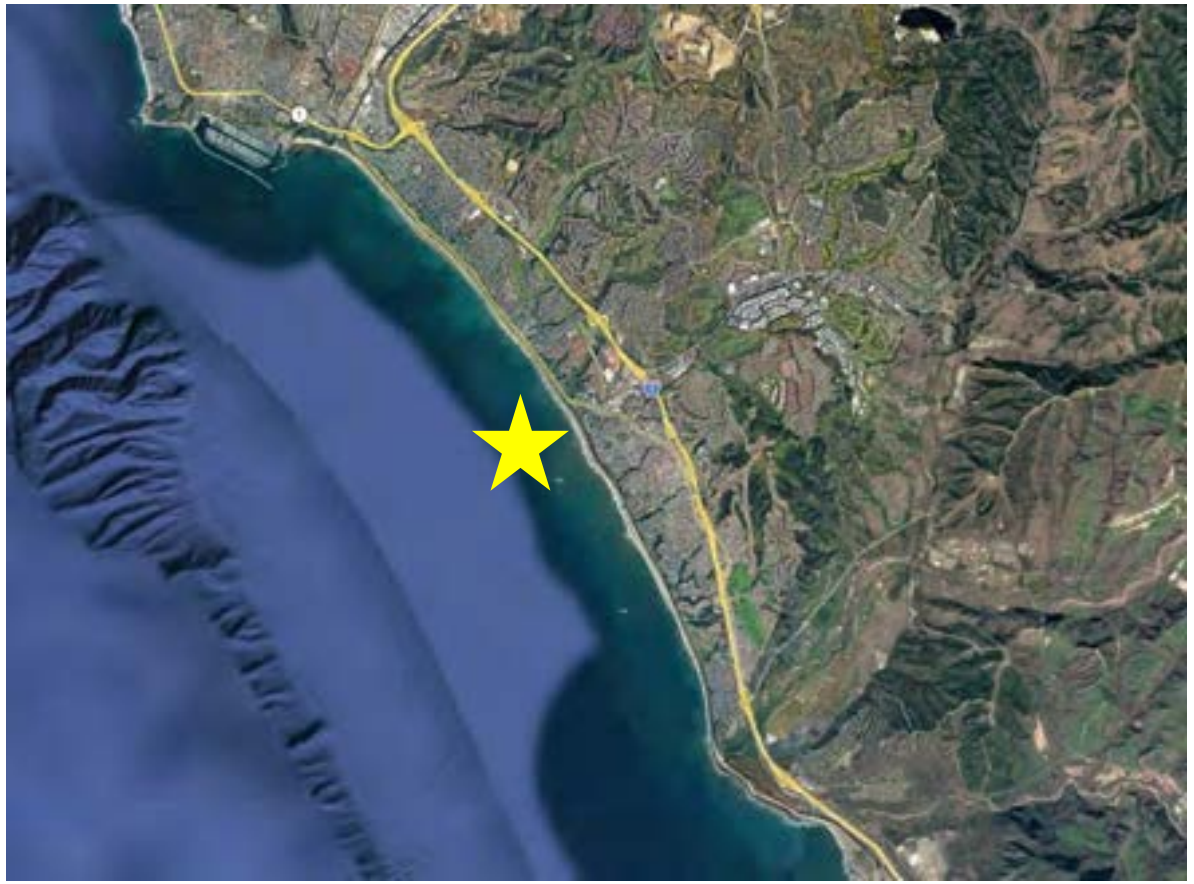
Oceanside Re:Beach – Long straight planform

- Less likely to hold nourishment
- Needs retention due to dispersion rate



San Clemente Reef – Slightly curved embayment

- More likely to hold nourishment, if in sufficient quantities
- Also needs retention if quantities are modest



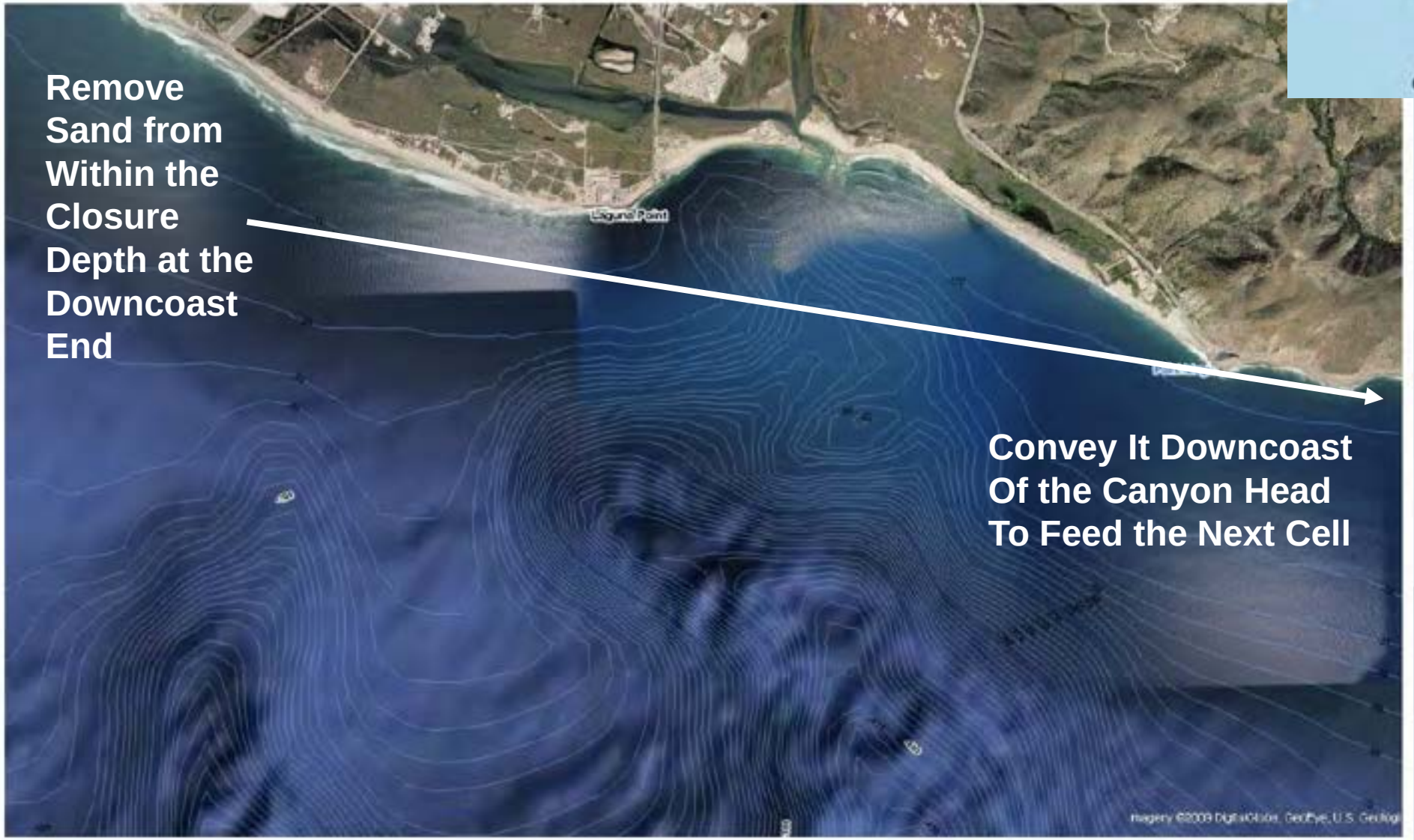
Refined Concept – Physical Lab Tests Show Promise

Rough Concept – Following the Re:Beach Process

Other Potential Approaches

By-pass sand around Mugu Submarine Canyon

to feed north LA County – USACE, US Navy, and BEACON



SCSC Formed to Seek Funding and Implement Resilience Projects

- Broad coalition for all of southern California
- Bigger needs and results
- Attract the dredging community to increase competition and reduce prices

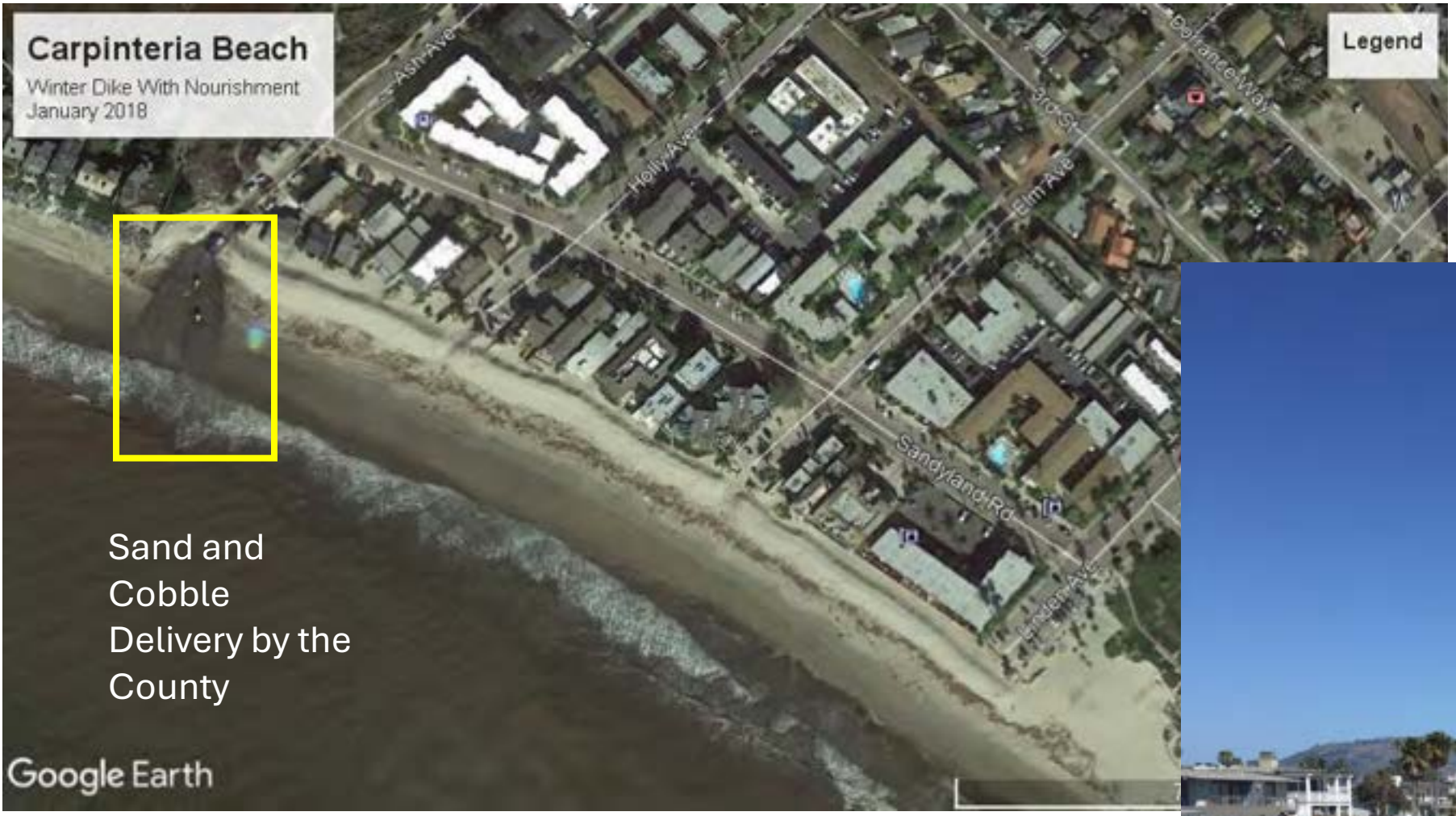
The State of California's Economic Engine

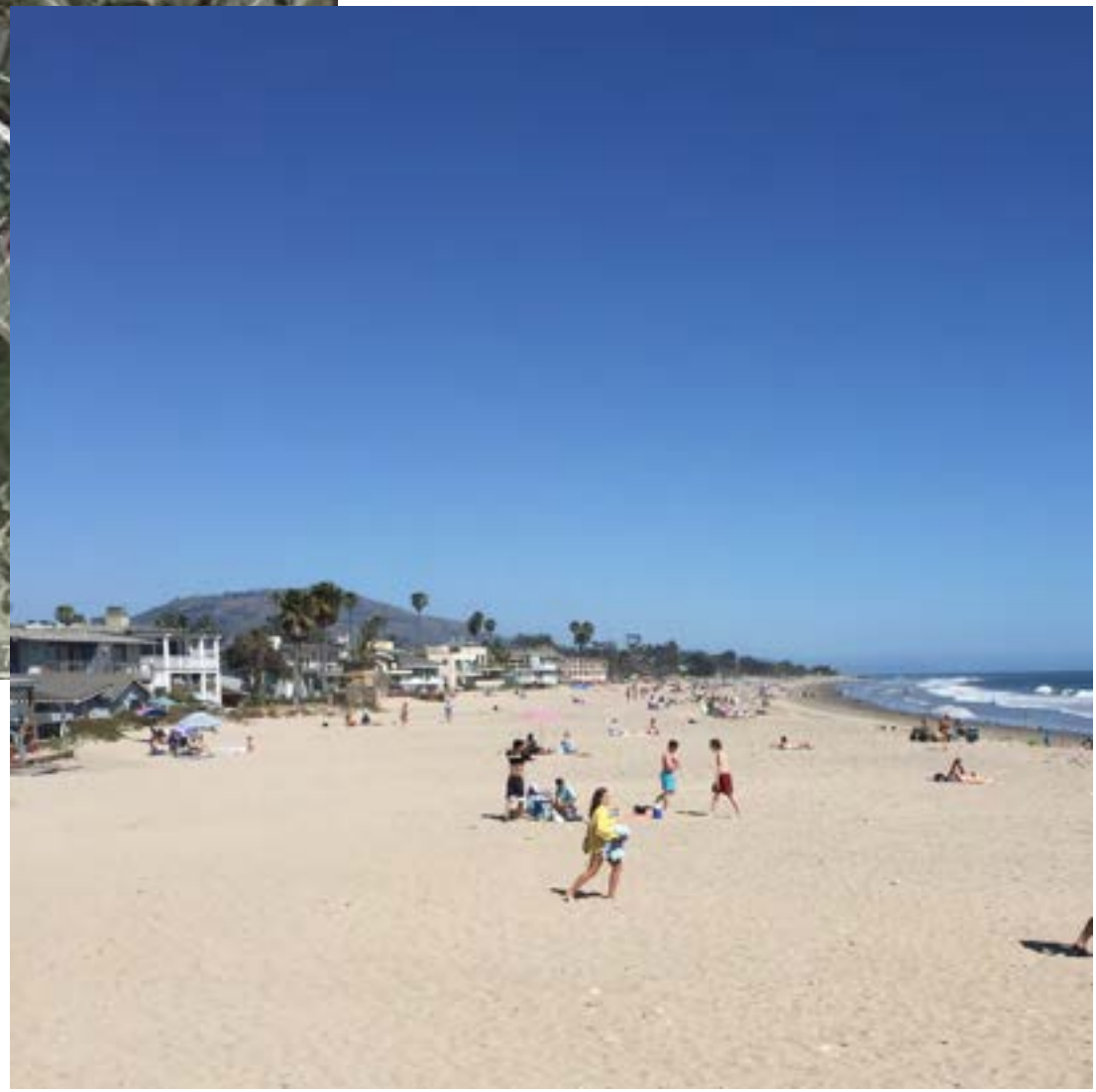
- King 1999 – The Fiscal Impact of Beaches…"Beaches contribute significantly to the State's economy."
- The State does not significantly invest in them
- AB64 mandated a budget for beach-building and maintenance
- Investing in certain beaches would more than off-set costs

Southern California Beach Nourishment - An Investment that Pays for Itself and Provides:

1. Resilience
2. Respites - during climate change
3. Recreation
4. Revenue
5. Protection
6. Habitat

Thank you! Questions?





Santa Barbara County Flood Control District removal of debris basin material and delivery to Carpinteria Beach increased beach width