

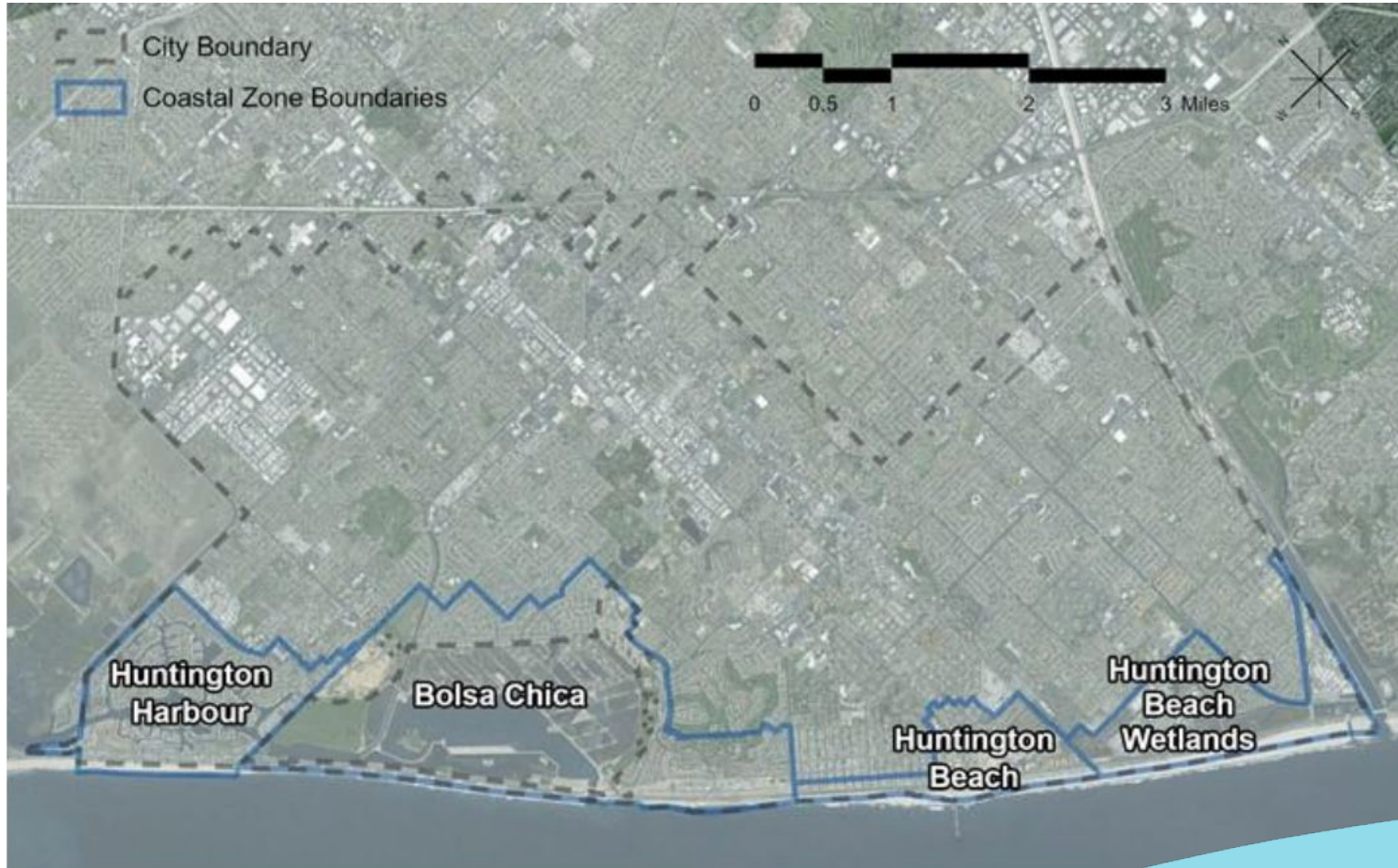
Neighborhood Scale Adaptation

City of Huntington Beach

Ursula Luna-Reynosa

Director of Community Development

Huntington Beach Context



Huntington Beach Context



Coastal Hazards Examples

Sunset Beach
Storm Damage 1942

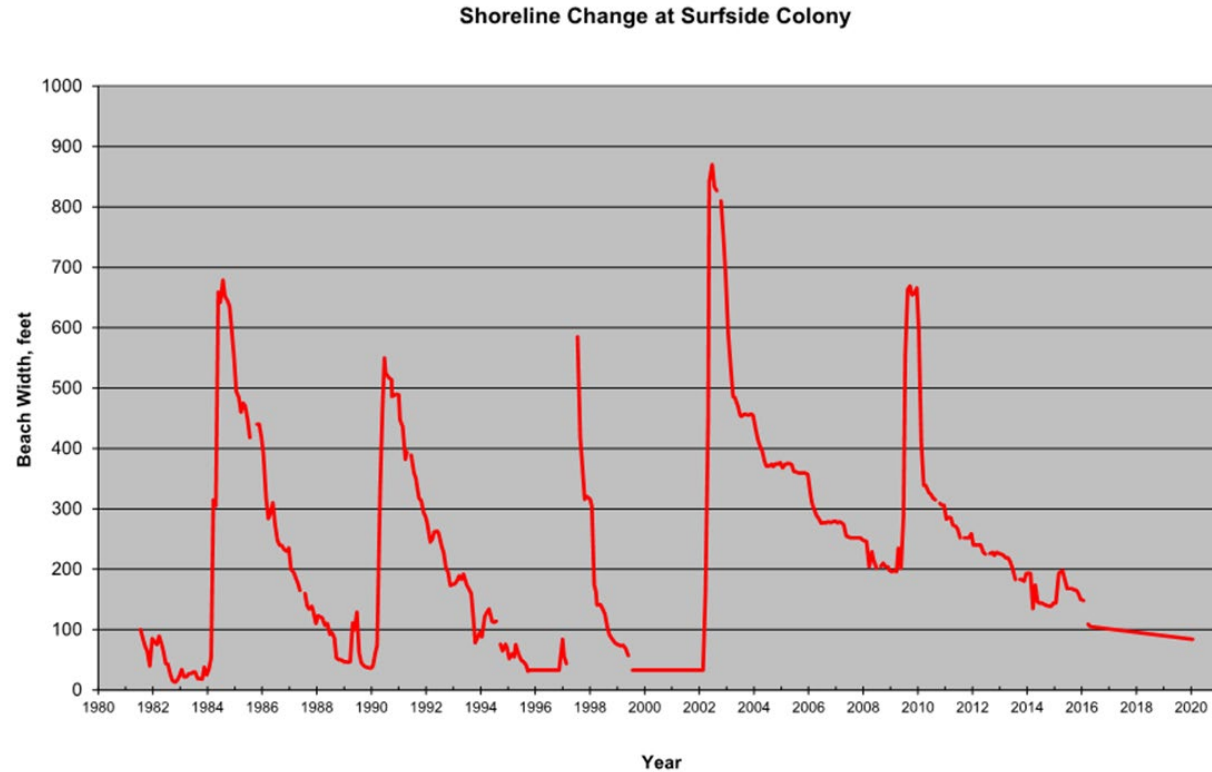


Coastal Erosion at
Sunset Beach
Hurricane Marie 2014



HB Sand Nourishment Program History

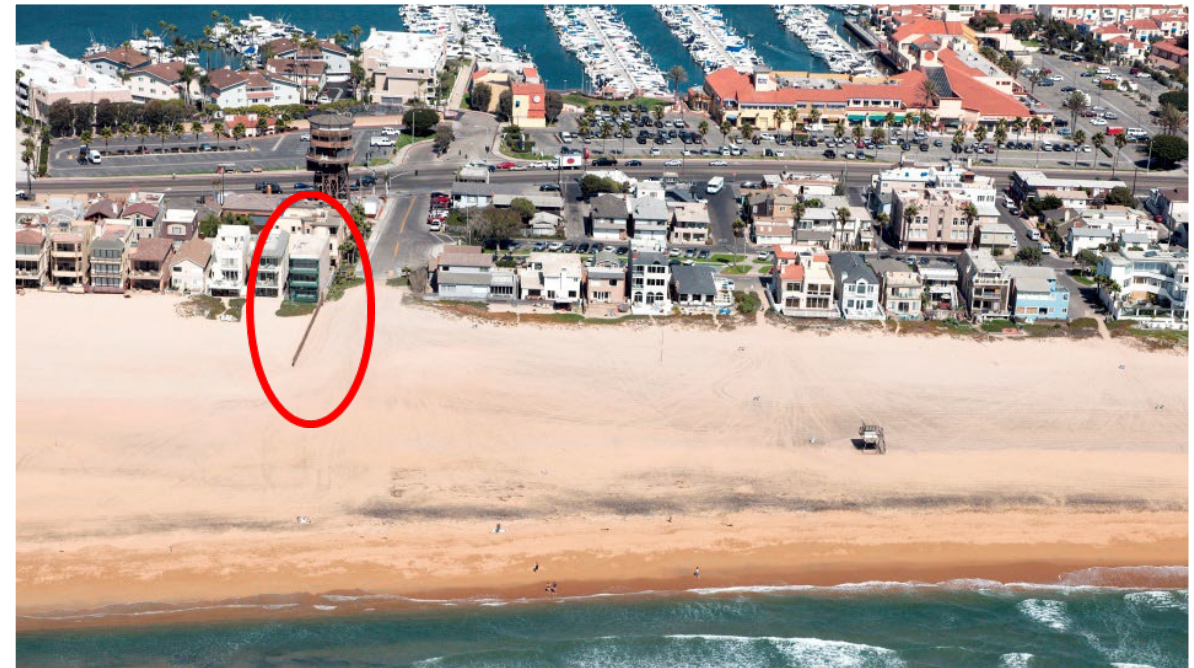
Year	Volume (cy)	Source
1964	4,000,000	Upland
1971	2,260,000	Upland
1979	1,644,000	Offshore
1983	400,000	Channel
1984	1,500,000	Offshore
1984	783,000	Upland
1989	180,000	Channel
1990	1,300,000	Offshore
1990	522,000	Offshore
1997	1,630,000	Offshore
2002	2,233,000	Offshore
2009	1,500,000	Offshore



Huntington Beach Sand Nourishment Program



Pre-Project

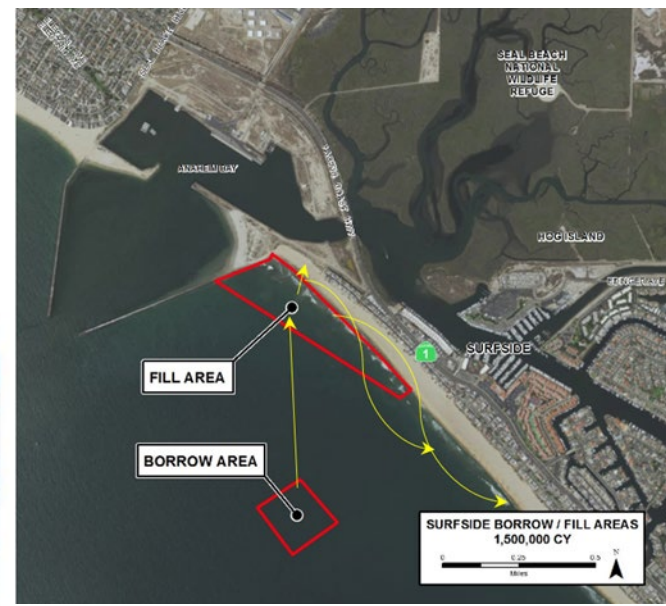


Post-Project
Stage 12

New agreements get massive Orange County beaches sand project closer to reality



A worker builds a sand dune ahead of an incoming storm at Surfside on Monday, December 13, 2021. The Surfside-Sunset Sand Nourishment project is expected to start Fall 2024. (Photo by Jeff Gritchen, Orange County Register/SCNG)



Stage 13 Funding:

Total Project Cost	\$23,130,000
Federal (67%)	\$15,500,000
Non-Federal (33%)	\$7,630,000



Huntington Harbour Sub Area



Huntington Harbour Sub Area



Bolsa Chica Sub Area



Bolsa Chica Sub Area



Huntington Beach Wetlands Sub Area



Huntington Beach Wetlands Sub Area



Jeff Gritchen, Orange County Register



Project Level Resilience Strategies

Benefits + Challenges

- Site Elevation
- **Structural Shoreline Protection**
- Nature Based Shoreline Protection
- Deployable Flood Barriers
- Dry Floodproofing

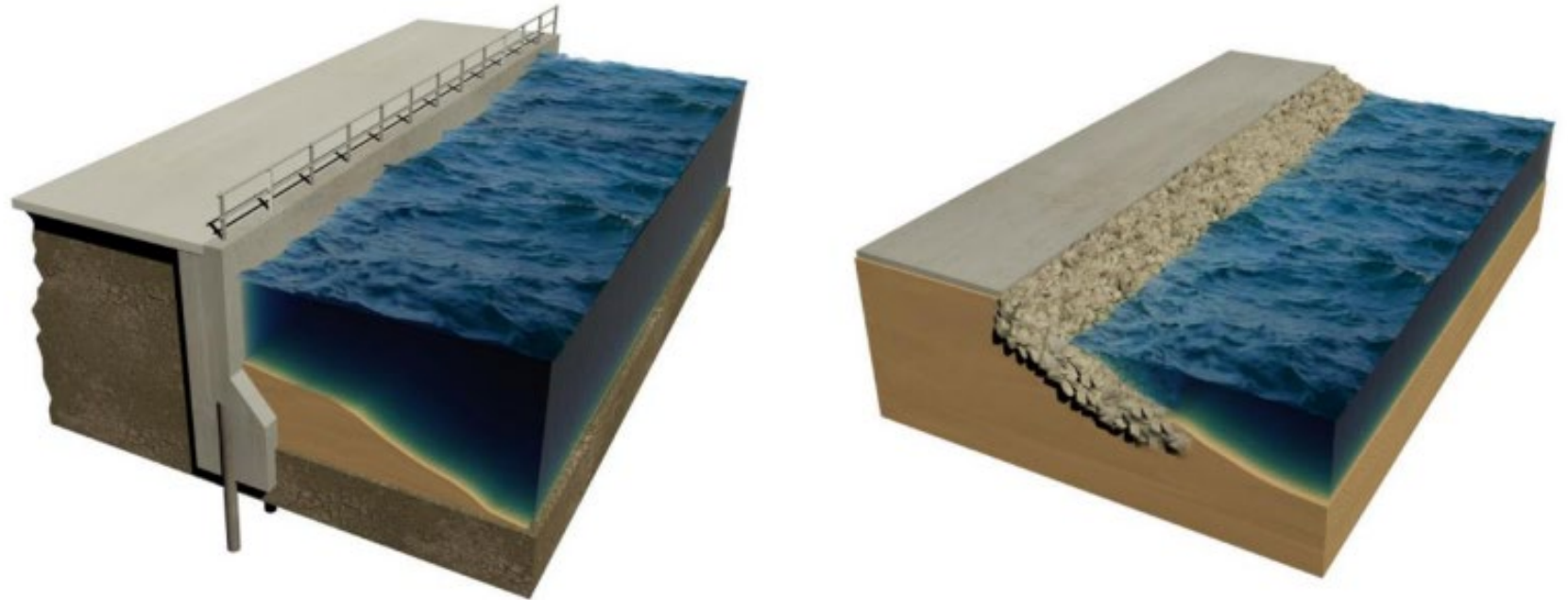


FIGURE 7
Example of a Seawall (left) and Revetment (right) as Structural Shoreline Protection Measures

Project Level Resilience Strategies

Benefits + Challenges

- Site Elevation
- Structural Shoreline Protection
- **Nature Based Shoreline Protection**
- Deployable Flood Barriers
- Dry Floodproofing

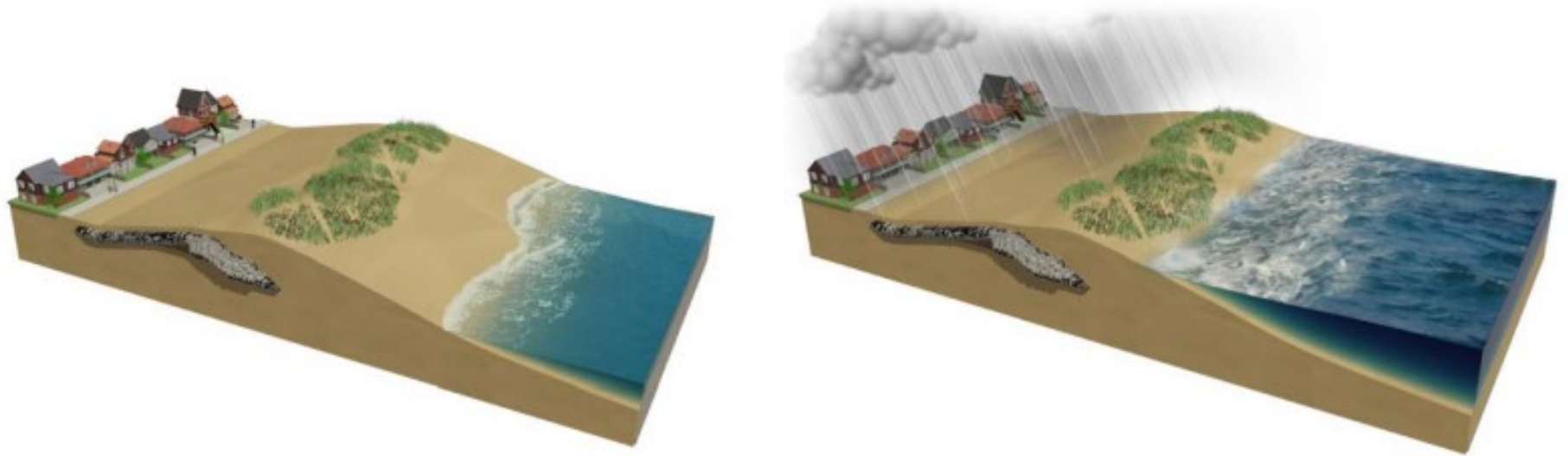


FIGURE 8
Example of a Hybrid Dune System as a Nature-Based Shoreline Protection Measure

Project Level Resilience Strategies

Benefits + Challenges

- Site Elevation
- Structural Shoreline Protection
- Nature Based Shoreline Protection
- **Deployable Flood Barriers**
- Dry Floodproofing

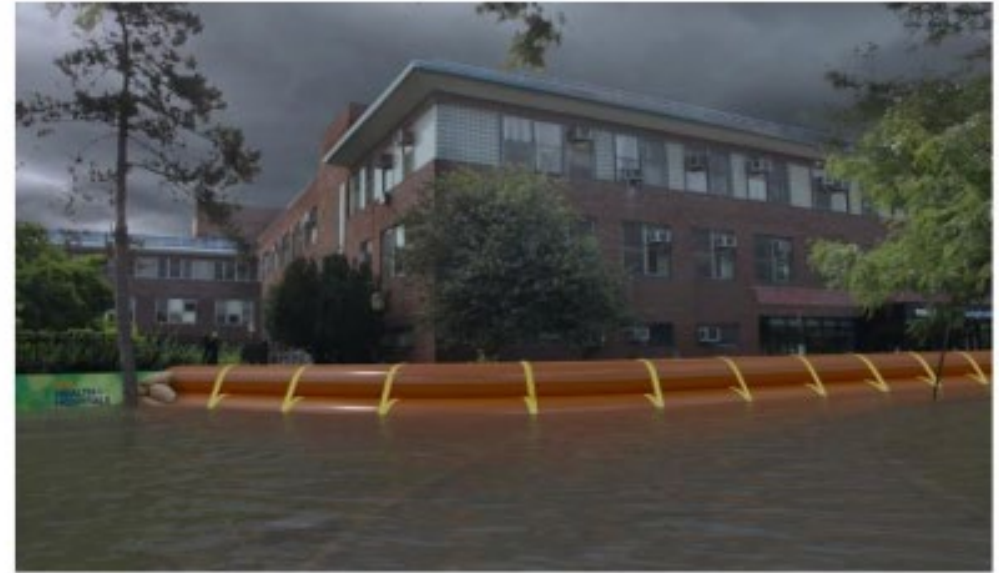


FIGURE 9
Example of an Inflatable Tiger Dam as a Deployable Flood Barrier

Project Level Resilience Strategies

Benefits + Challenges

- Site Elevation
- Structural Shoreline Protection
- Nature Based Shoreline Protection
- Deployable Flood Barriers
- **Dry Floodproofing**

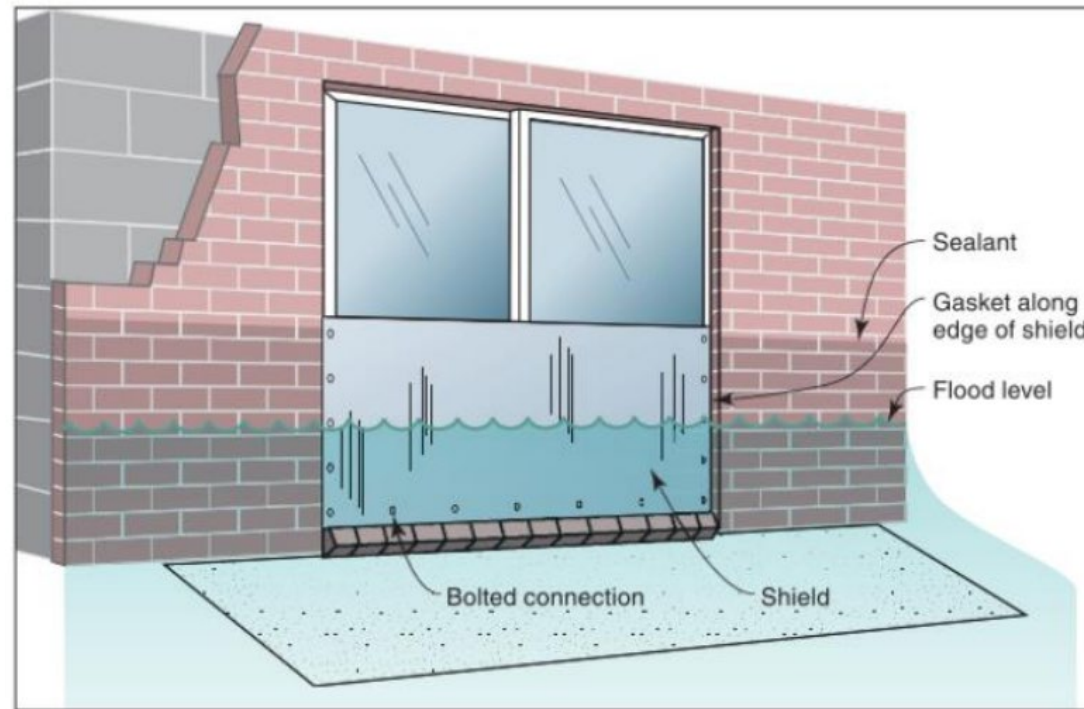


FIGURE 10
Example of Dry Floodproofing Measures using Bolted Connections (FEMA, 2014)

