Urban Southern California is Characterized by Beaches

Photos Courtesy of Bob Guza And Ron Flick, 2007
Provide recreation, protection and habitat

Invertebrates

Photo Courtesy of Dave Hubbard
Man-Made Beaches – Santa Monica Breakwater in 1940
Man-Made Beaches – Venice Tombolo
Los Angeles – Sand from Marina Del Rey dredging and Hyperion Treatment Plant

Sand Moves North to South

SM and Venice Retaining Structures

Downcoast Retaining Structure
Newport Beach – Sand from Newport Harbor dredging, the USACE, and Santa Ana River

Sand Moves North to South

Downcoast Retaining Structure
Coronado – Sand from San Diego Bay Dredging

Downcoast Retaining Structure

Sand Moves South to North
San Elijo Lagoon Restoration Project – Dredging and Nourishment

Image Source: Marathon Construction, 2018
Pre-Fill Beach at Cardiff – January 2018
New Beach at Cardiff – April 2018
Objectives for “Successful” Nourishment

<table>
<thead>
<tr>
<th>Objectives</th>
<th>Strategies to Accomplish Objectives</th>
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<td>Longevity Within Littoral Zone</td>
<td>Coarser-grained sand lasts longer than finer sand</td>
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<td>Environmentally Sensitive</td>
<td>Avoid sensitive resources to the greatest extent</td>
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<td>Cost-Effective (Benefits/Costs)</td>
<td>Design for cost-effective construction (dredging)</td>
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<td>Sustainable (Can it continue?)</td>
<td>Sufficient sand supply for renourishment</td>
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<td>Adaptable (Can it be improved?)</td>
<td>Consider sand retention structures for future efforts</td>
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Planning and Design: Offshore Sand Search
Offshore sand used; designed to avoid impacts to habitat

Dredging off Del Mar
San Diego Regional Beach Sand Project
Site is Batiquitos Beach in Encinitas – Approximately 120,000 Cubic Yards

Wide beach in foreground (just nourished), narrow beach in background (not yet nourished)
## Advantages and Disadvantages of Beach Nourishment

<table>
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<tr>
<th>Advantages</th>
<th>Disadvantages</th>
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<td>Addresses the basic problem of a sediment budget deficit</td>
<td>Volumes needed to solve the problem can be very large</td>
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<td>Is a “soft” solution to narrowing beaches and shore protection</td>
<td>Can be “lost” (dispersed) during coastal storm wave events</td>
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<td>Provides a recreational play area and sand-bottom habitat</td>
<td>Can impact sensitive marine habitat</td>
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<td>Attracts revenue from visitors</td>
<td>Costs can be high, depending on project type (dredging)</td>
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Conclusions:

Beach Nourishment:

• Works, particularly when done upcoast of natural or man-made retention features.

• Has resulted in significant benefits for densely urbanized areas.

• Is a viable near- and mid-term adaptation strategy for climate change (SLR).

• Longer-term performance may be enhanced with sand retention.

• Can be designed to avoid / minimize impacts to habitat.
thank you