

Regional Shoreline Change Trends Along California's Beaches

Cheryl Hapke and Dave Reid

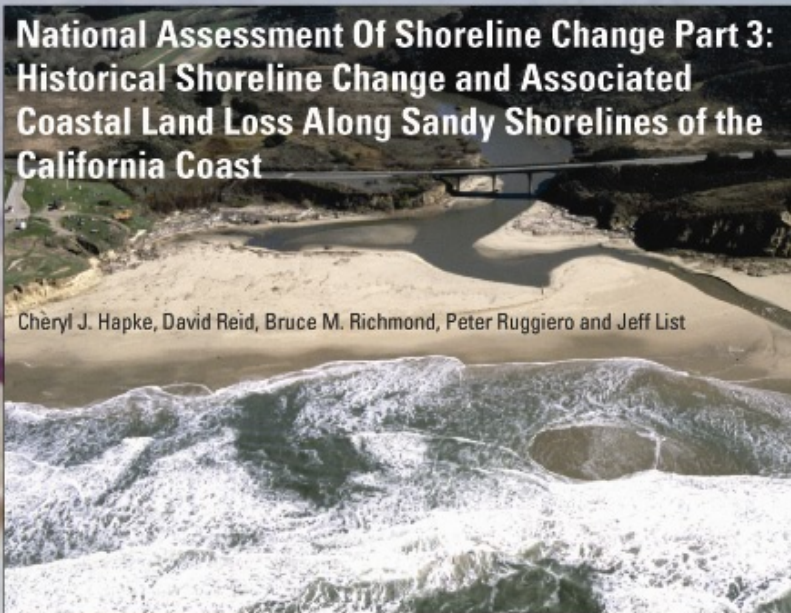
U.S. Geological Survey

Tara Miller
Bob Morton
Bruce Richmond

Peter Ruggiero
Abby Sallenger
Kathy Weber
Jeff List

**National Assessment Of Shoreline Change Part 3:
Historical Shoreline Change and Associated
Coastal Land Loss Along Sandy Shorelines of the
California Coast**

Cheryl J. Hapke, David Reid, Bruce M. Richmond, Peter Ruggiero and Jeff List



Open-File Report 2006-1219

U.S. Department of the Interior
U.S. Geological Survey

National Assessment Report:
<http://pubs.usgs.gov/of/2006/1219/>

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**National Assessment Data
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Purpose and Objectives

- **Determine California State Shoreline Change Rates**
 - **Long-Term (LT) 1880s – 1998/2002 (4 Shorelines)**
 - **Short-Term (ST) 1950/70s – 1998/2002 (2 Shorelines)**

(sandy open-ocean coastline)
- **Examine regional spatial and temporal trends in data**
- **Use methods consistent with those developed by the USGS for Gulf of Mexico and U.S. East Coast**
- **Digital data available for download**

Shoreline Dates and Sources:

1880s, 1930s: NOS T-sheets

1950s-70s:

NOS T-sheets (S./Cen. CA)

DRGs (Cen. /Nor. CA)

1998, 2002: Lidar

15 Analysis Regions

LT: 14,562 Transects

728 km

ST: 16,142 Transects

807 km



Central California

Net Long-term change rate: **-0.0 m/yr**

299 km

Net Short-term change rate: **-0.5 m/yr**

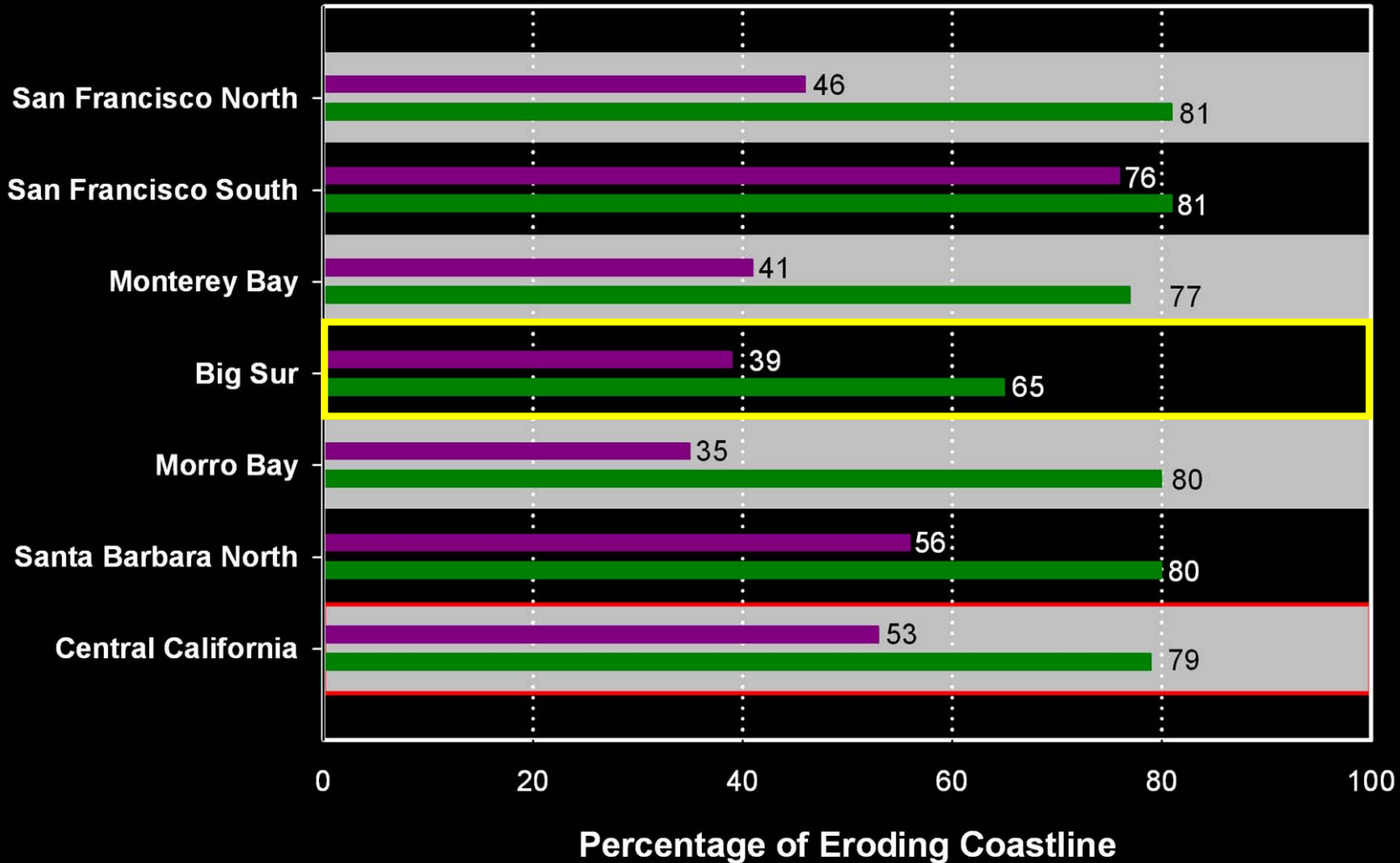
324 km

Long-term erosion rate	Short-term erosion rate	Long-term accretion rate	Short-term accretion rate
-0.3 m/yr 53%	-0.8 m/yr 79%	0.2 m/yr 47%	0.6 m/yr 21%

Central California Analysis Regions

Long-Term Short-Term

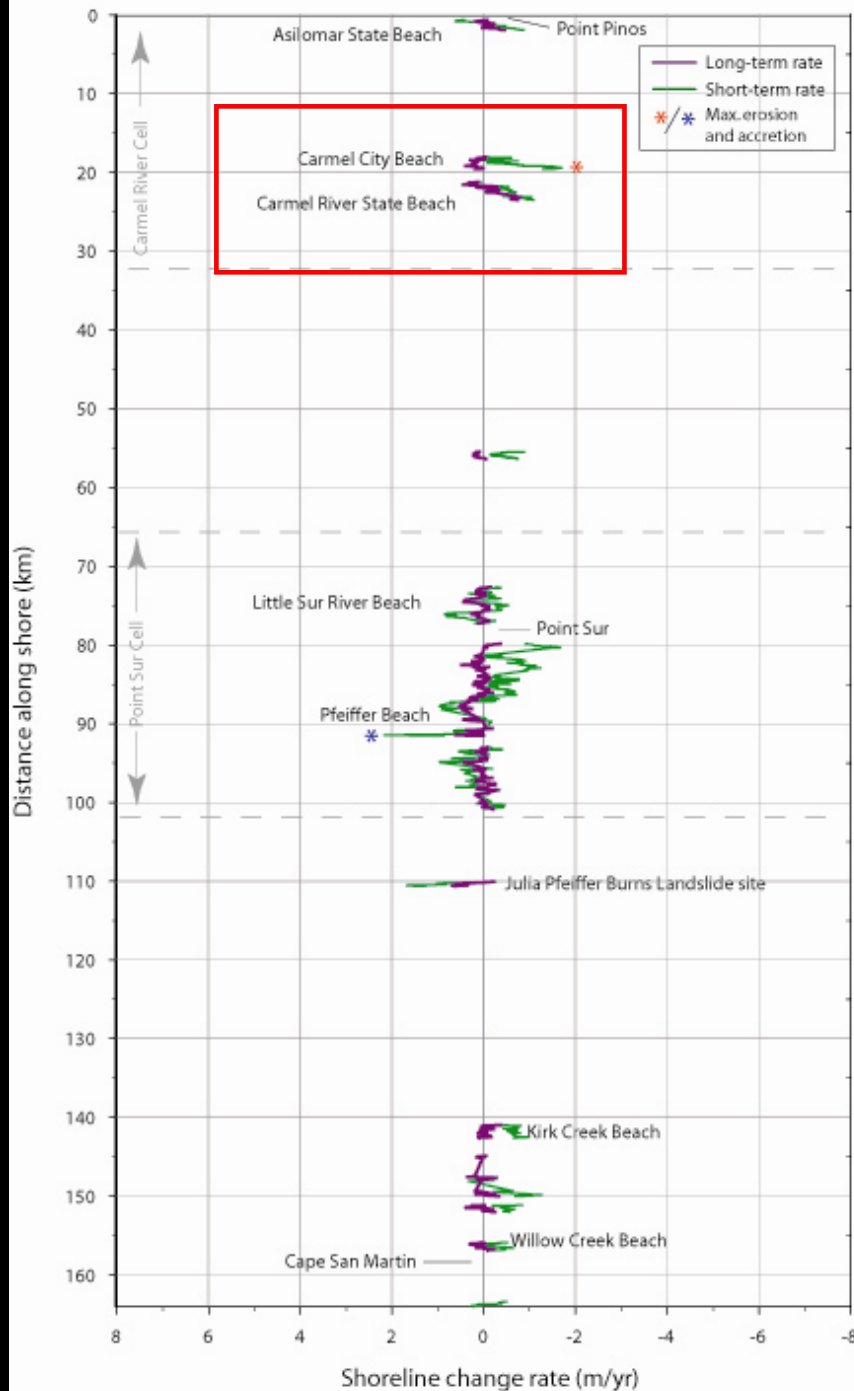
Largest Average Rates



-0.2 ± 0.1

-0.7 ± 0.4

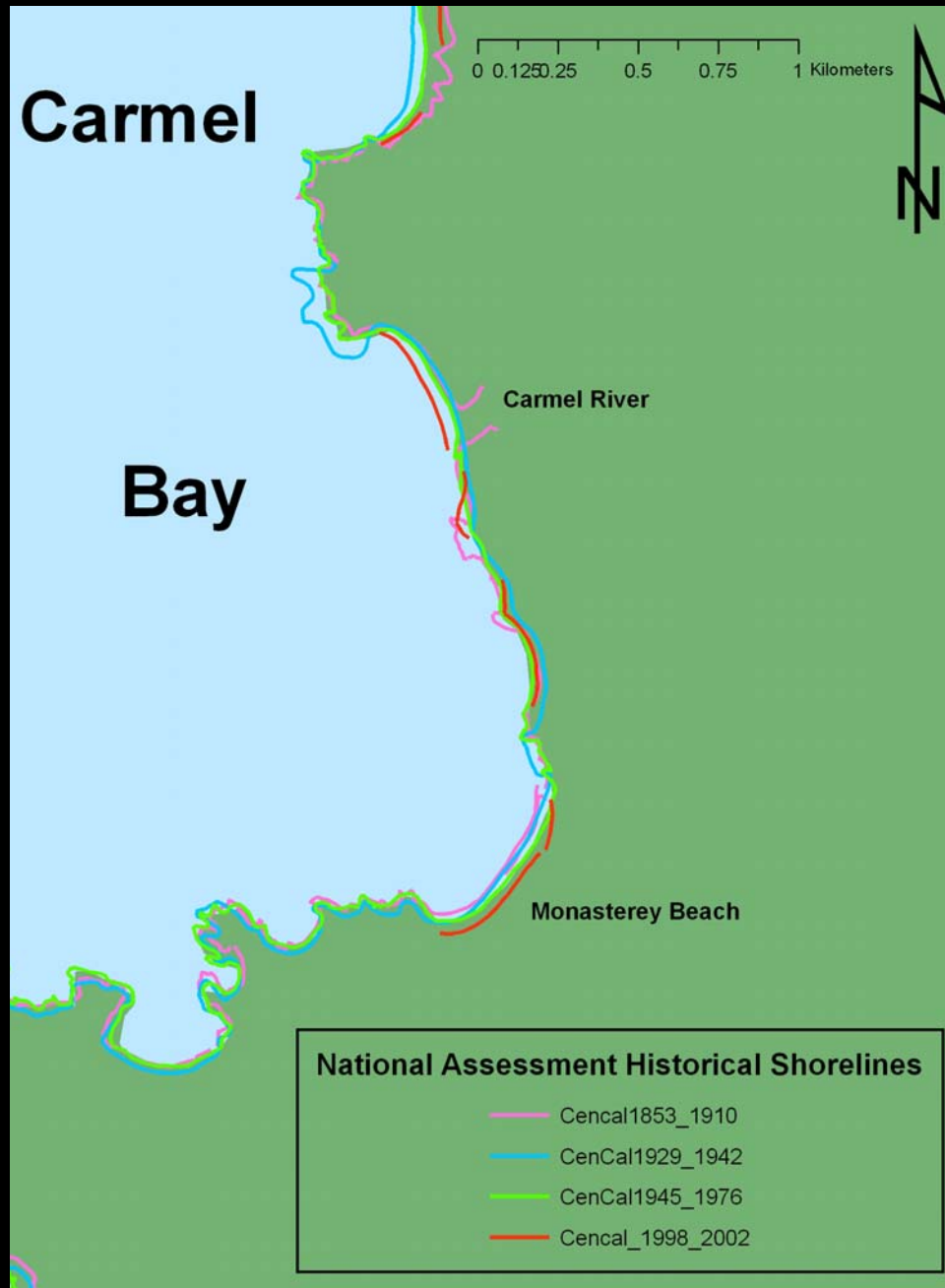
Shoreline Change: Big Sur Region



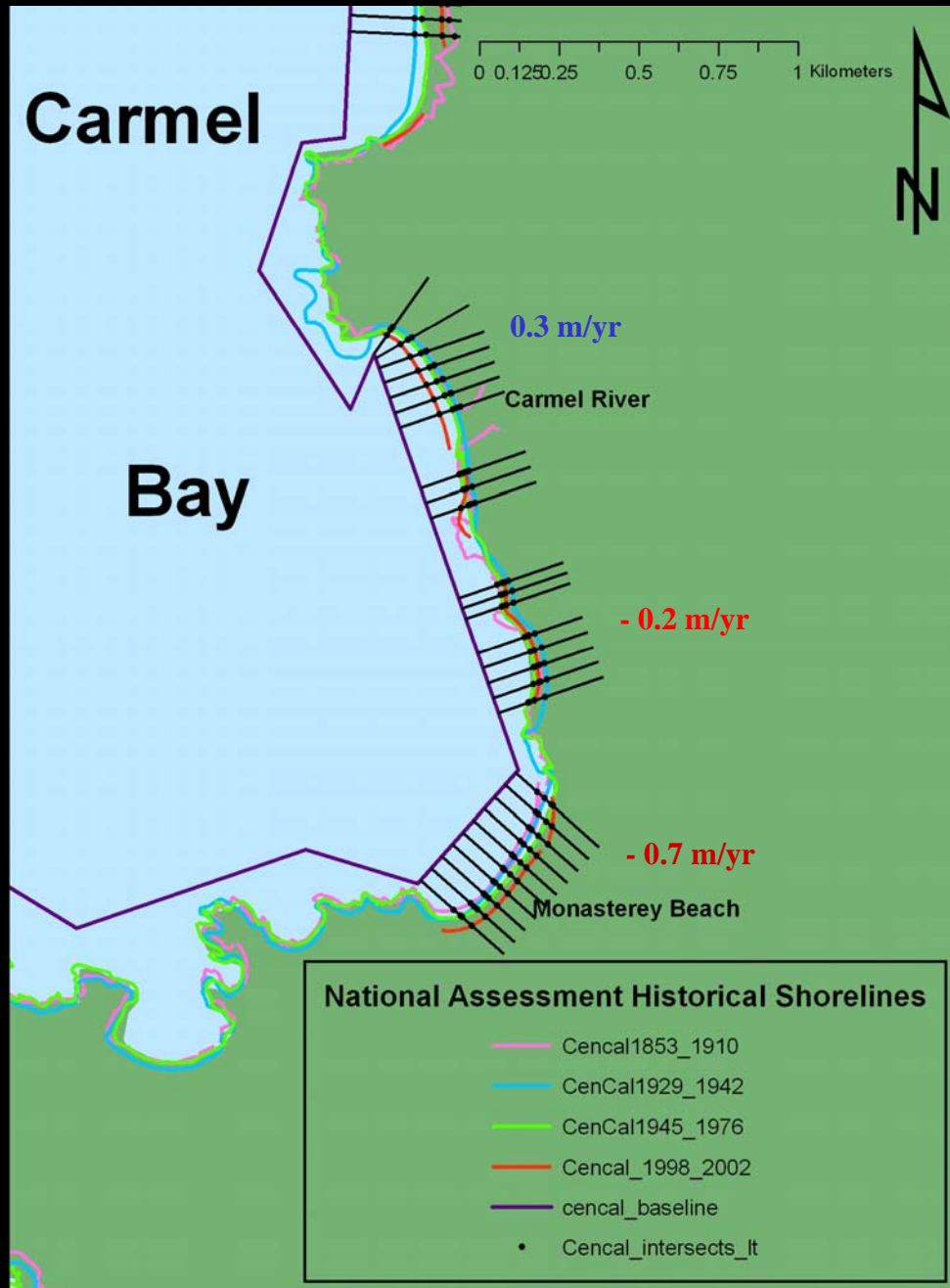
Big Sur Region

- 25.6 km Long-Term
- 26.7 km Short-Term
- 39 % Eroding LT
- 65 % Eroding ST
- Steady-State LT Rate
- - 0.2 m/yr ST Rate

National Assessment Data



National Assessment Data



Sediment distribution and transport along rocky, embayed coast: Monterey Peninsula and Carmel Bay, California

C.D. Storlazzi and M.E. Field
Marine Geology 2000

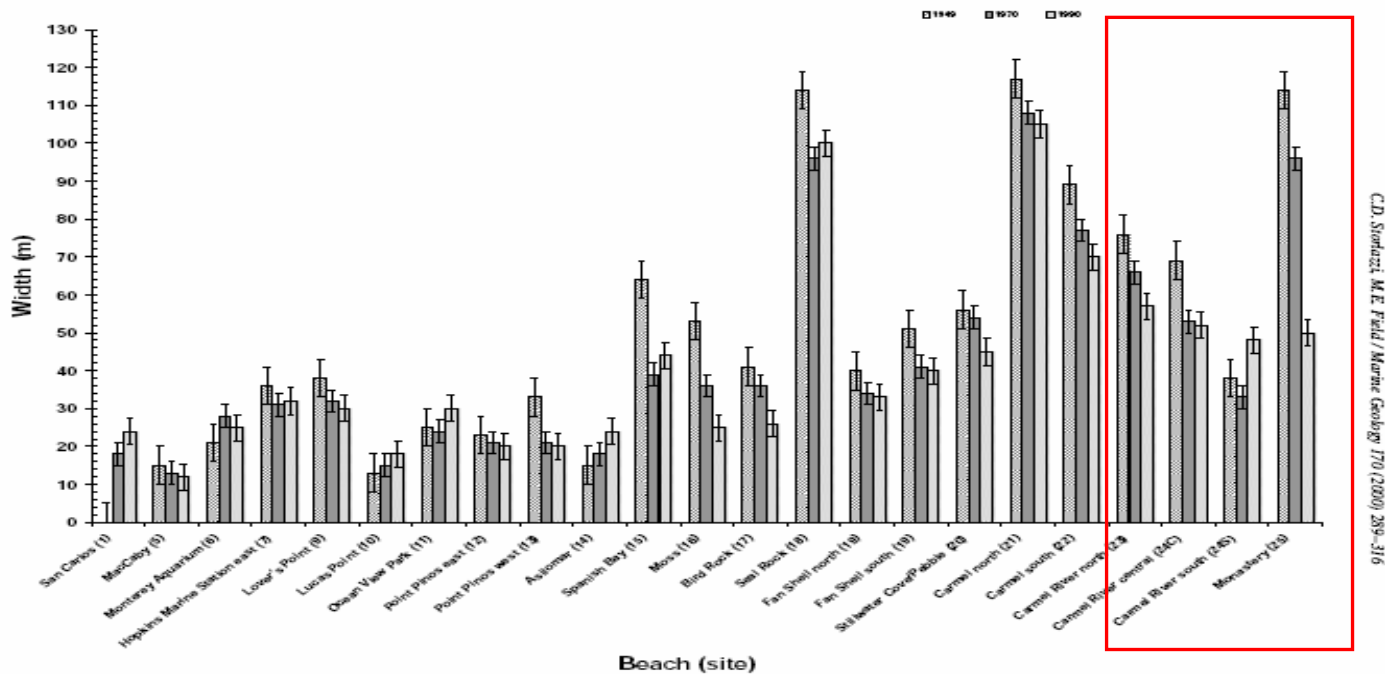


Fig. 3. Changes in beach width between 1949 and 1990 measured from aerial photography taken in the summer months. The maximum error in width is ± 5 m as dictated by the 1949 1:20 000 imagery. Most of the decreases in beach width observed along the study area are interpreted to result from such anthropogenic activities as sand mining, the construction of housing and golf courses, and increased farming.

1949

1970

1990

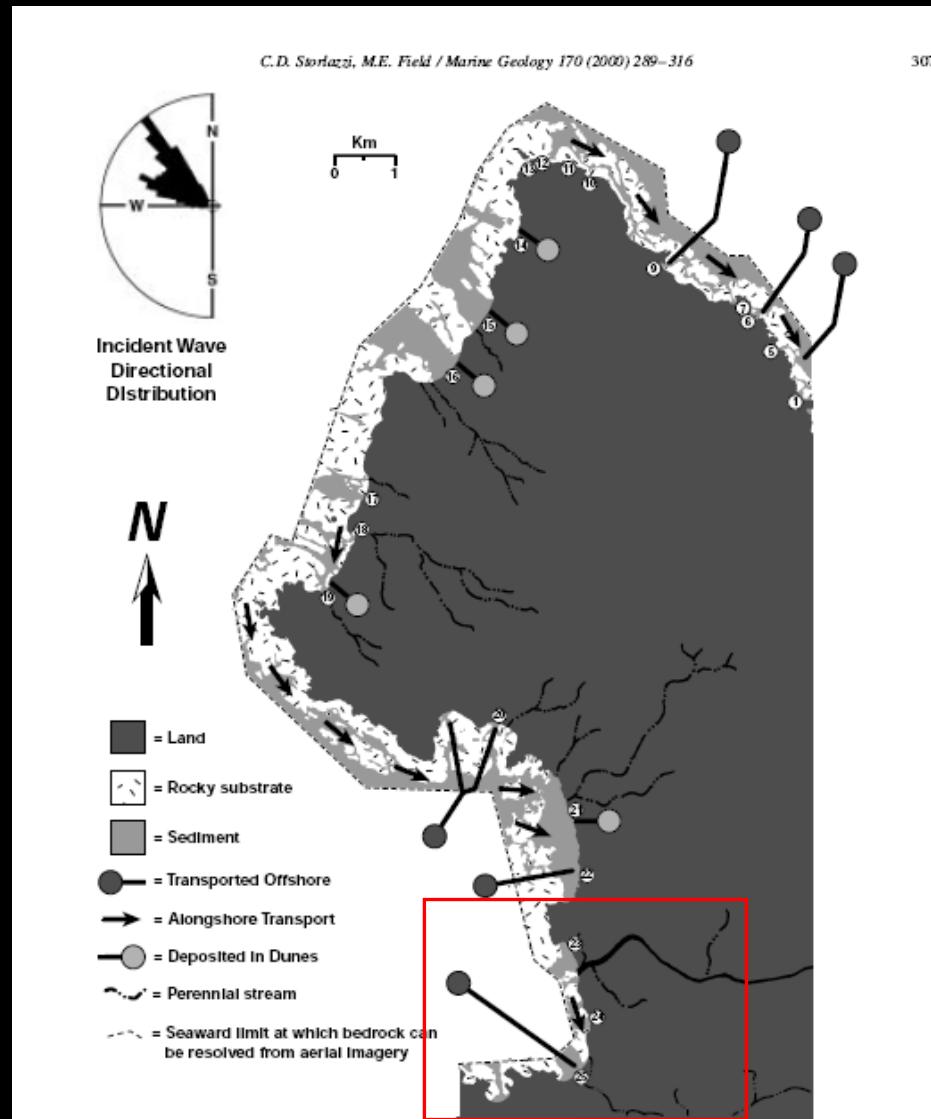


Fig. 10. Interpreted sediment distribution overlain by the dominant littoral sediment transport pathways and sinks along the study area. The wave rose for the central coast was compiled from over 12 000 deep-water buoy observations between 1995 and 1998 (Coastal Data Information Program, 1998). Note the correlation between transport pathways and sediment patterns.

October 28, 2005



California Coastal Records Project
<http://www.californiacoastline.org>

October 11, 2004



California Coastal Records Project
<http://www.californiacoastline.org>

August 12, 2003



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June, 1987



California Coastal Records Project
<http://www.californiacoastline.org>

April 30, 1979



California Coastal Records Project
<http://www.californiacoastline.org>

1972



California Coastal Records Project
<http://www.californiacoastline.org>