

Carmel River Beach Shoreline History

An aerial photograph of Carmel River Beach. The image shows a wide, sandy beach curving along the coastline. Large, white-capped waves are crashing onto the shore from the left. The ocean water is a deep green color. In the background, a residential neighborhood with houses and trees is visible, separated from the beach by a road. The Carmel River is visible on the right side of the image, flowing into the ocean.

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Naval Postgraduate School

April 9, 2005

April 6, 2005



April 9, 2004



Sediment Budget for Beach

INPUT

Sediment discharge from river

Dams- San Clemente, 1921

Los Padres, 1947

Floods (1969, 1983, 1995, 1998)

Watershed modifications

Fires (1977, 1999)

Riparian Vegetation- pumping of
aquifer

LOSS

South down the canyon

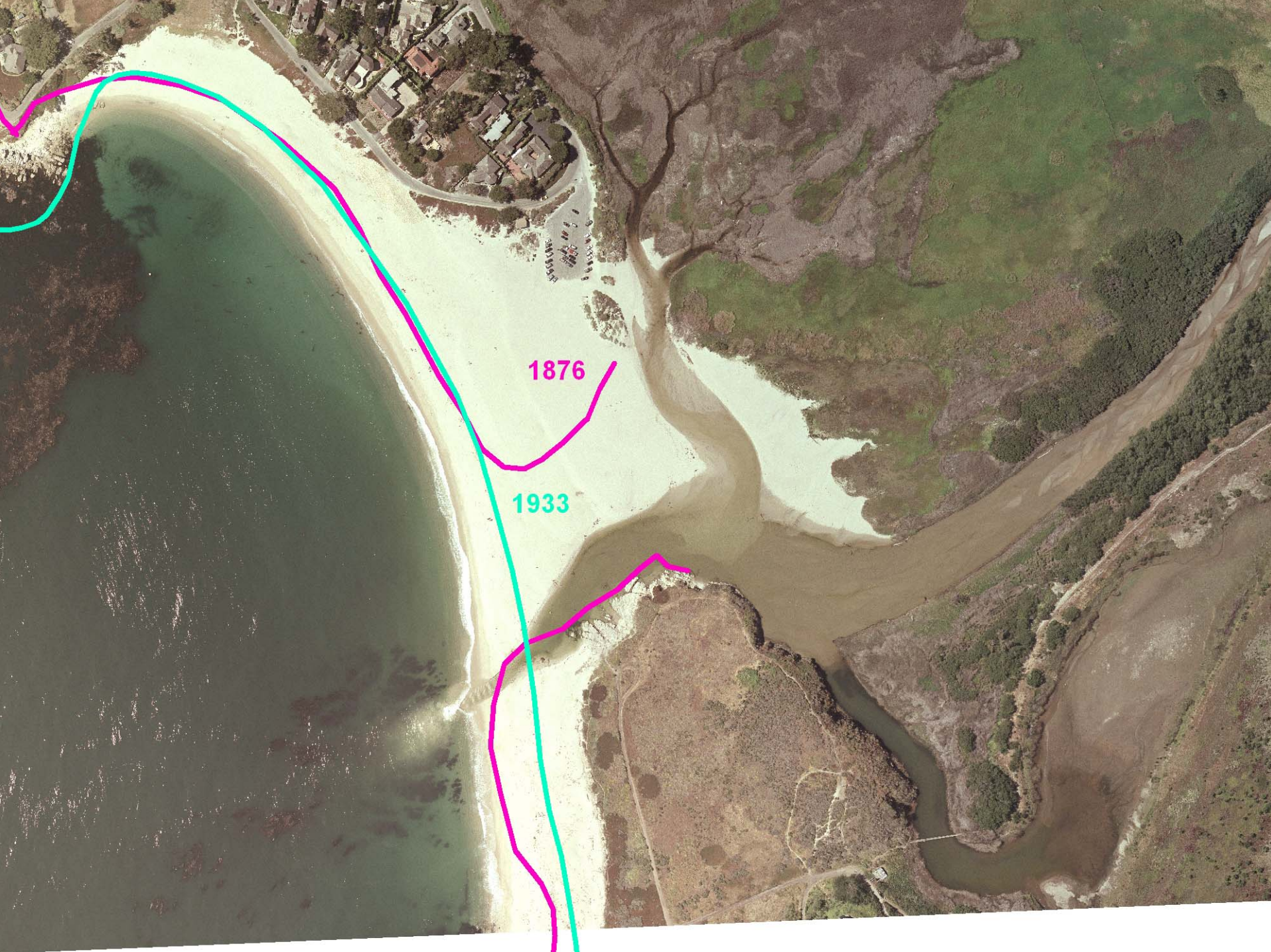
Offshore down the canyon

2003 Aerial Photo



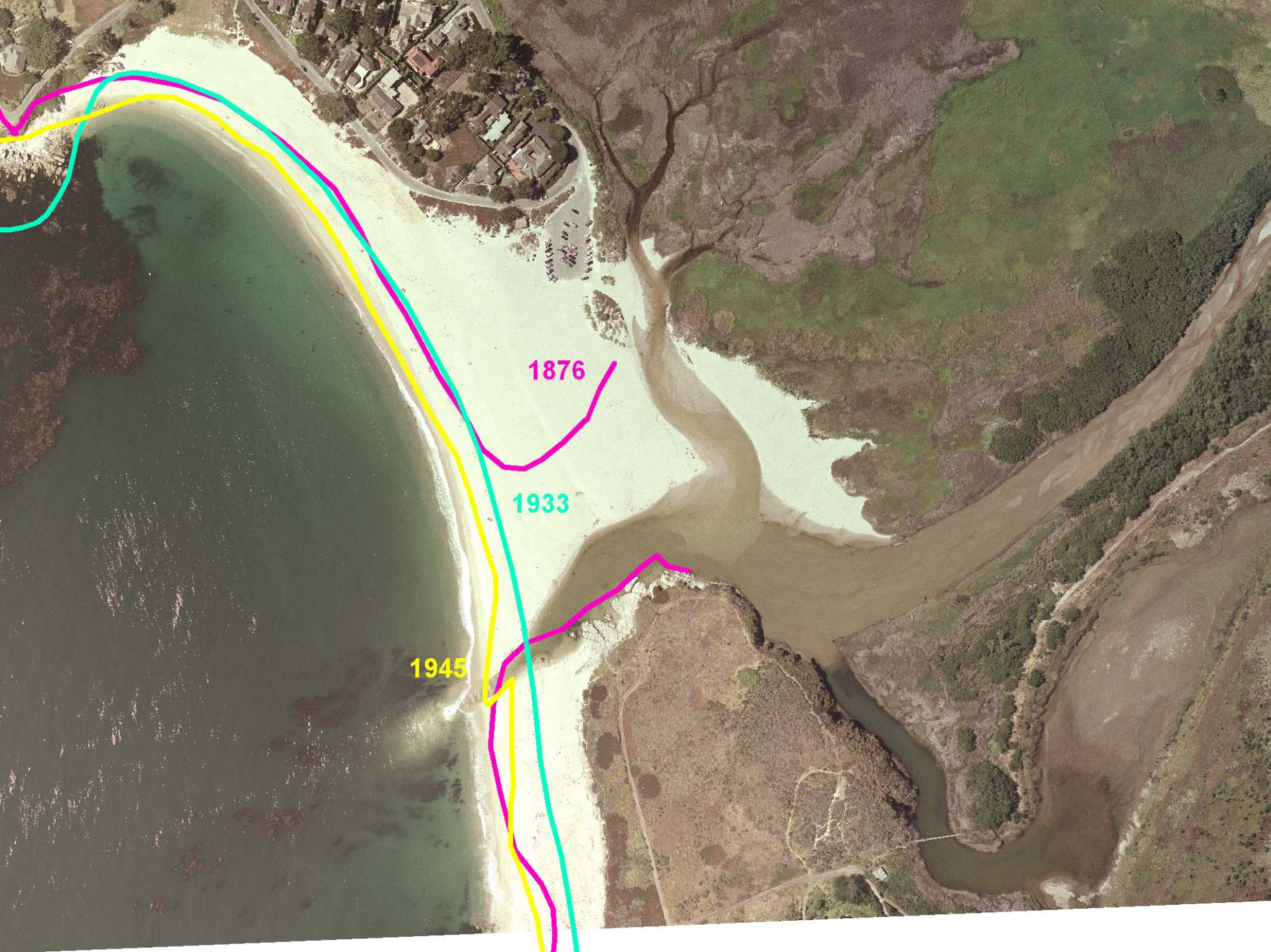


1876



1876

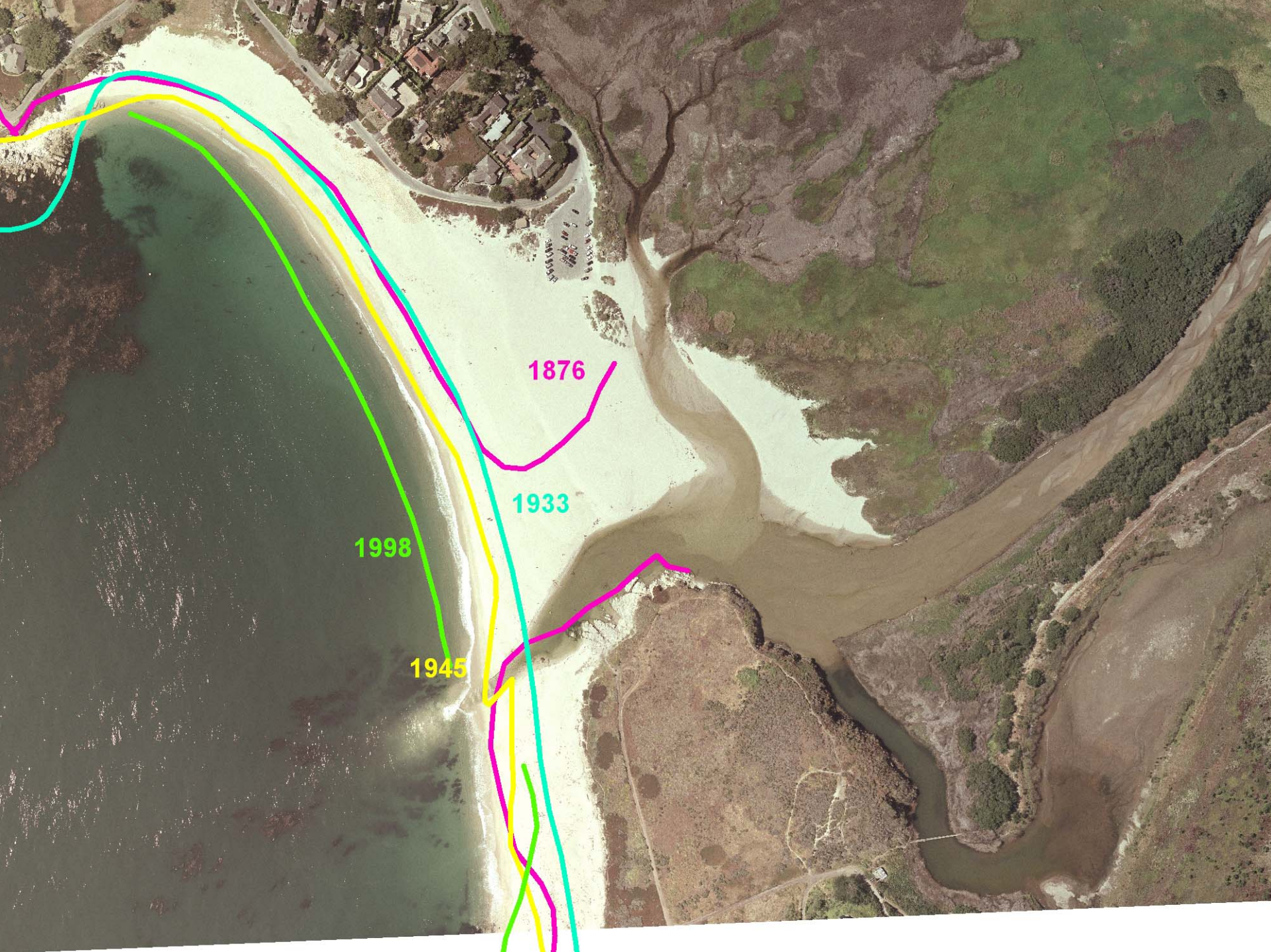
1933



1876

1933

1945



1876

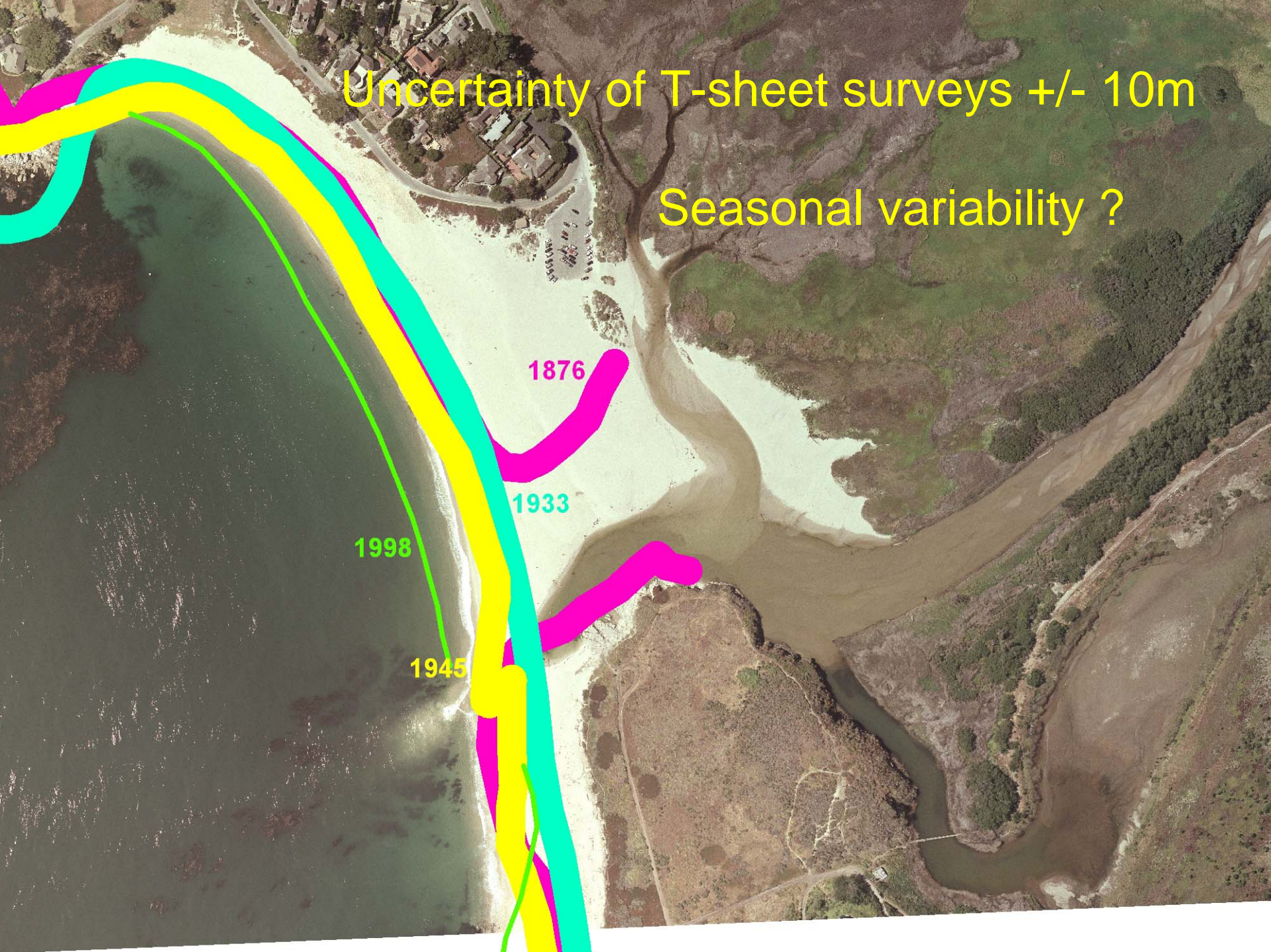
1933

1998

1945

Uncertainty of T-sheet surveys +/- 10m

Seasonal variability ?



1876

1933

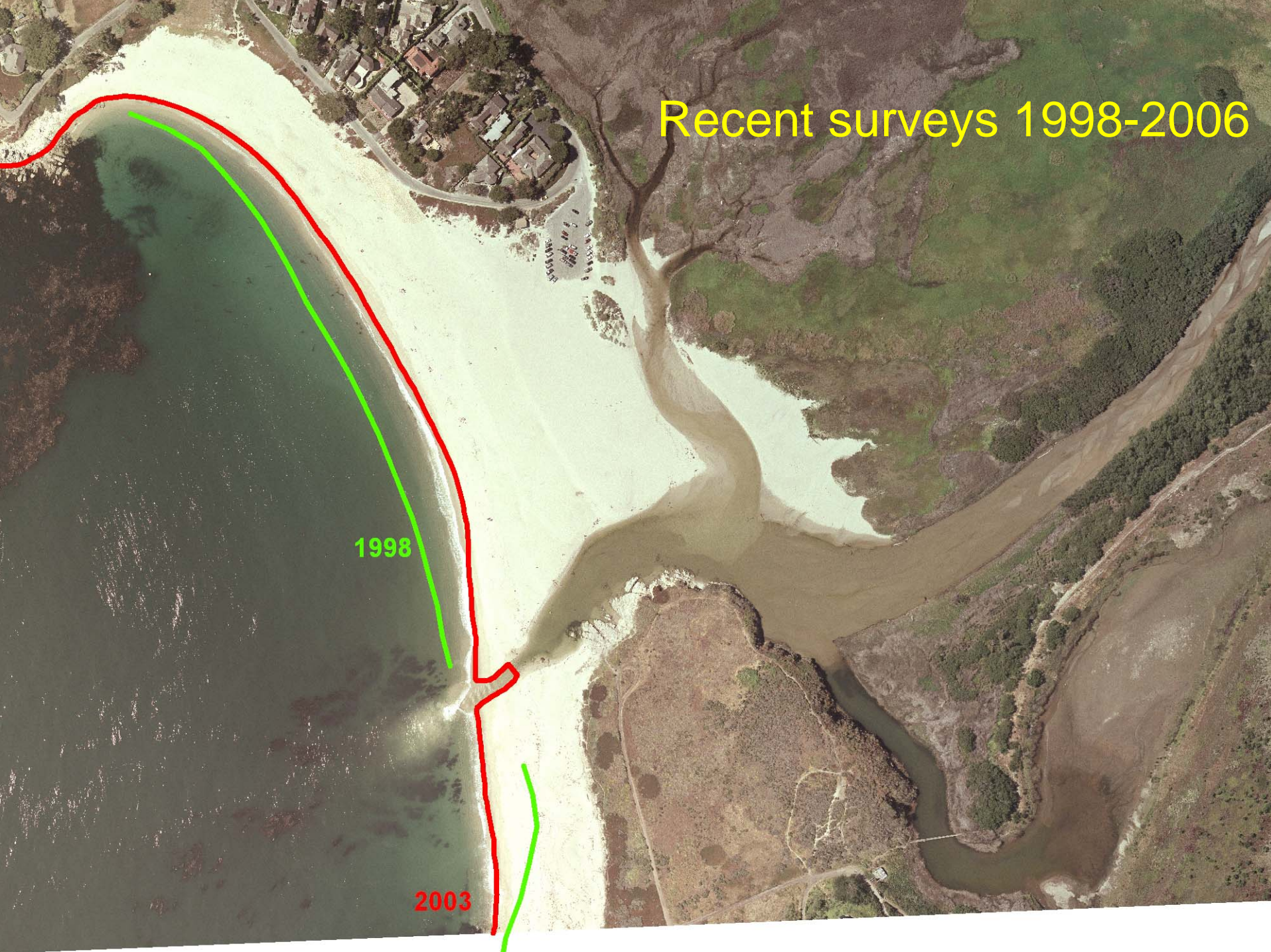
1998

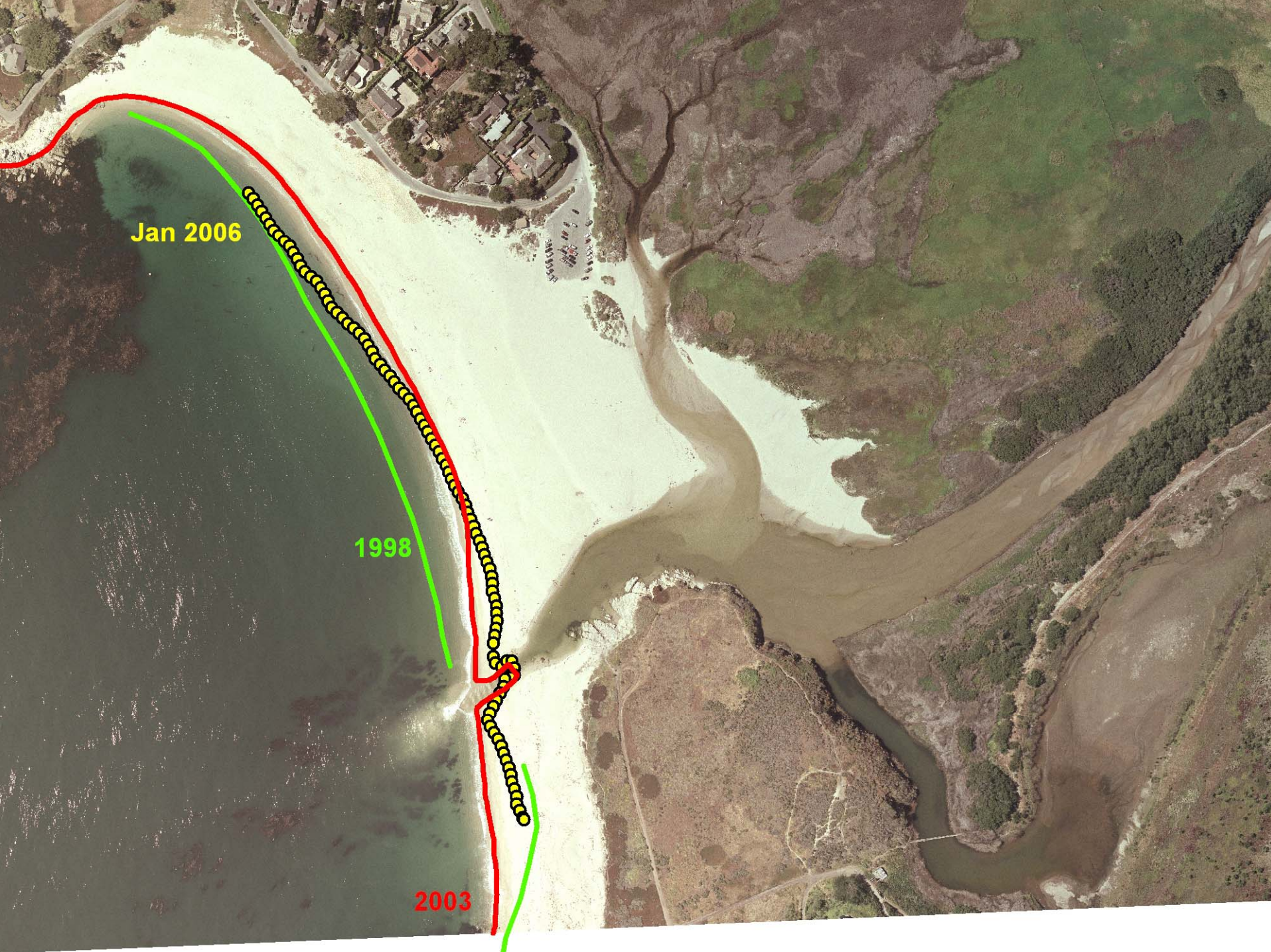
1945

Recent surveys 1998-2006

1998

2003

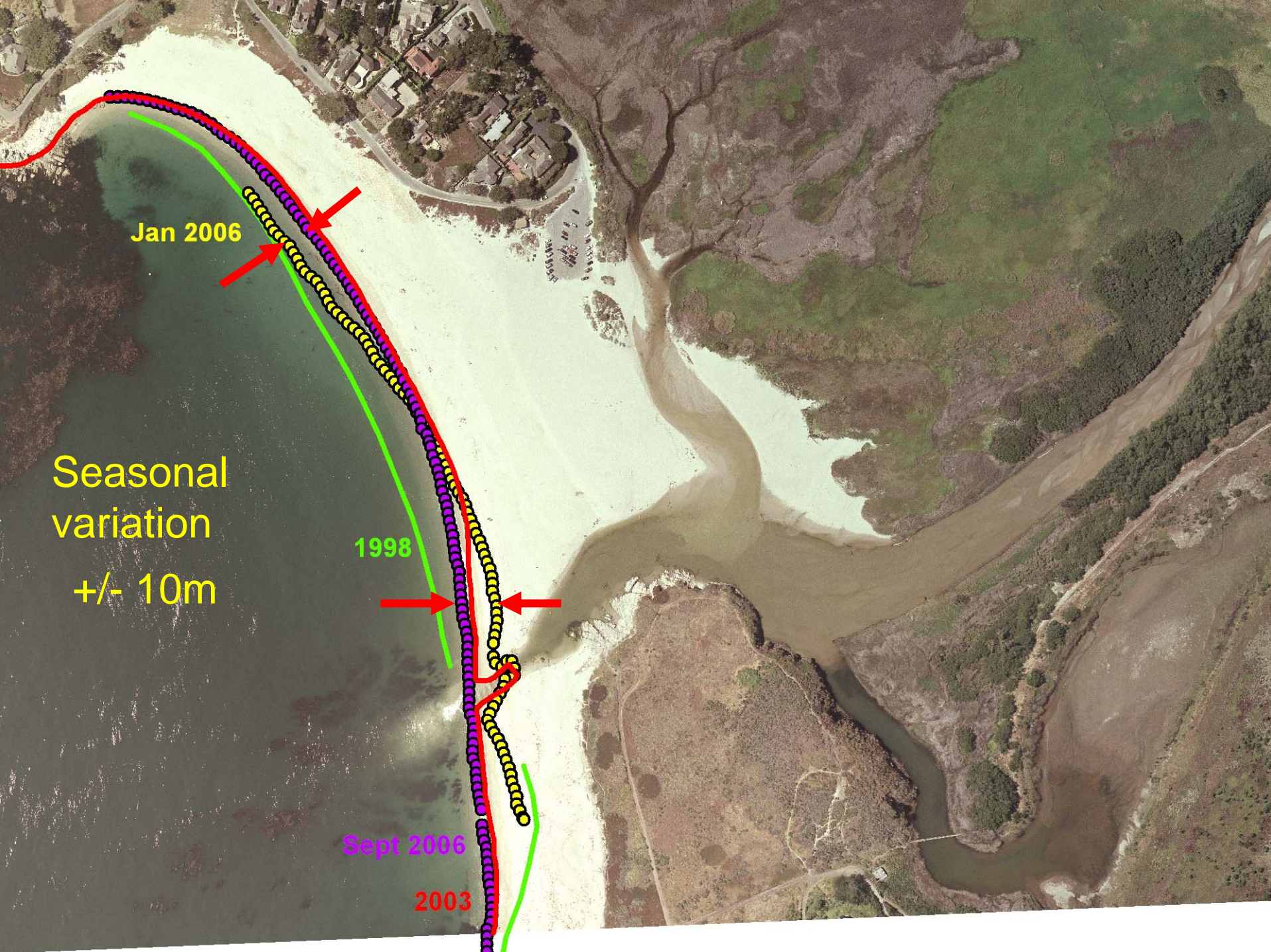




Jan 2006

1998

2003



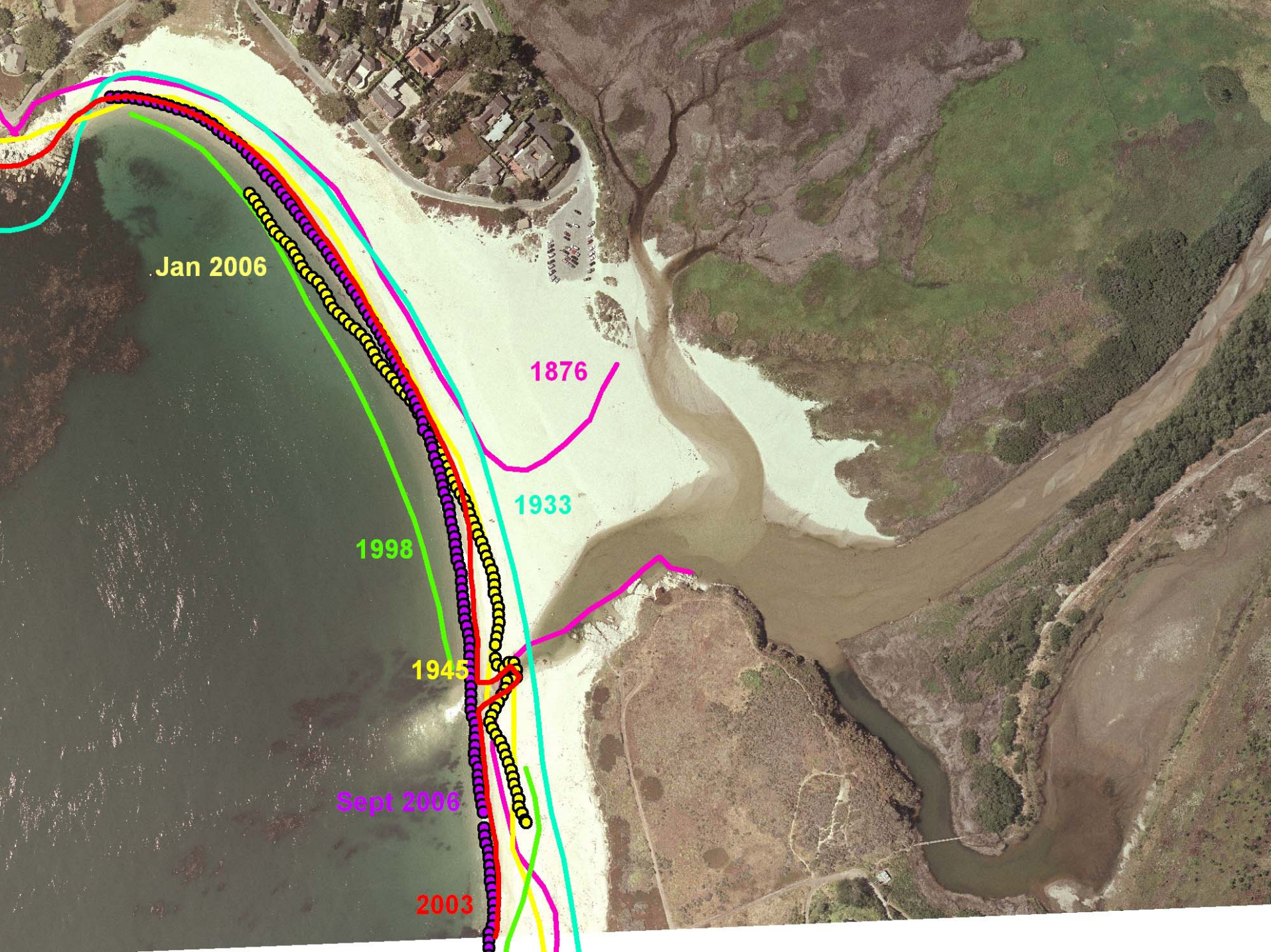
Jan 2006

Seasonal
variation
+/- 10m

1998

Sept 2006

2003



Jan 2006

1876

1933

1998

1945

Sept 2006

2003

Conclusion

The shoreline has been *remarkably* stable over the last 300 years

Why?



2003 Aerial Photo



Bathymetry- Nov 5, 2005
Beach Topo- Jan 6, 2006

