UCLA MARINE SCIENCE CENTER Ocean Globe

GPS Introduction
Southern California Bight: Investigating Bearings and Distances

Purpose: To use a GPS to measure the distance between points along the coast of southern California.

Materials: GPS
Chart or Map of southern California

Procedures:

1- Your GPS can calculate the distance between any two points once their coordinates (latitudes & longitudes) have been marked as a landmark or, in nautical terms, a waypoint, and stored in the GPS.

2- Start by selecting the two points on the chart of southern California that you want to analyze.

For example, let's say your class is taking a research trip out of Ventura Harbor to Anacapa Island to study the *Zalophus californianus* rookery.

First we would mark the coordinates for Ventura Harbor, then the coordinates for the East End of Anacapa, where the rookery is located.

3- To mark and store any waypoint in your GPS, begin by pressing the MARK button. Follow these simple steps:

a- Use the arrow keys to change the default "LM01" LandMark name to something related to your waypoint, such as "VENT" for Ventura Harbor. Then press ENTER.

b- Use the arrow keys again to change the current LATITUDE display numerals to the latitude of Ventura Harbor, which is 34^{O} 14.30'N. Then press ENTER.

c- Do the same thing to change the default LONGITUDE display numbers to the longitude of Ventura, which is 119^{O} 16.90'W. Press ENTER. ***Congratulations, you have just marked your first landmark or waypoint in your GPS!***

4- Next, mark and store a waypoint in your GPS for the East End of Anacapa Island, following the same steps as for Ventura. Be sure to look up the proper coordinates for Anacapa.

5- To determine the distance of a route between any two waypoints, such as Ventura and Anacapa, do the following:

a- Press the MENU button a couple of times until the display says "ROUTE PRESS ENT TO CREATE." Press ENTER.
[NOTE: If the display says "ROUTE PRESS ENT TO VIEW," there is an existing route and you must delete the existing route before creating a new one.]

b- The GPS prompts you for a starting landmark or waypoint for the route. Use the arrow pad to scroll through the list of landmarks, when the desired landmark (VENT) is displayed, press ENTER.

c- The display changes to allow the selection of the landmark to be used as the end of the first leg of the route. Use the arrow pad again to scroll through the list. When the desired landmark (for Anacapa) is displayed and flashing, press ENTER.

6- The screen updates showing you the bearing and distance from the start of this leg to the displayed landmark!

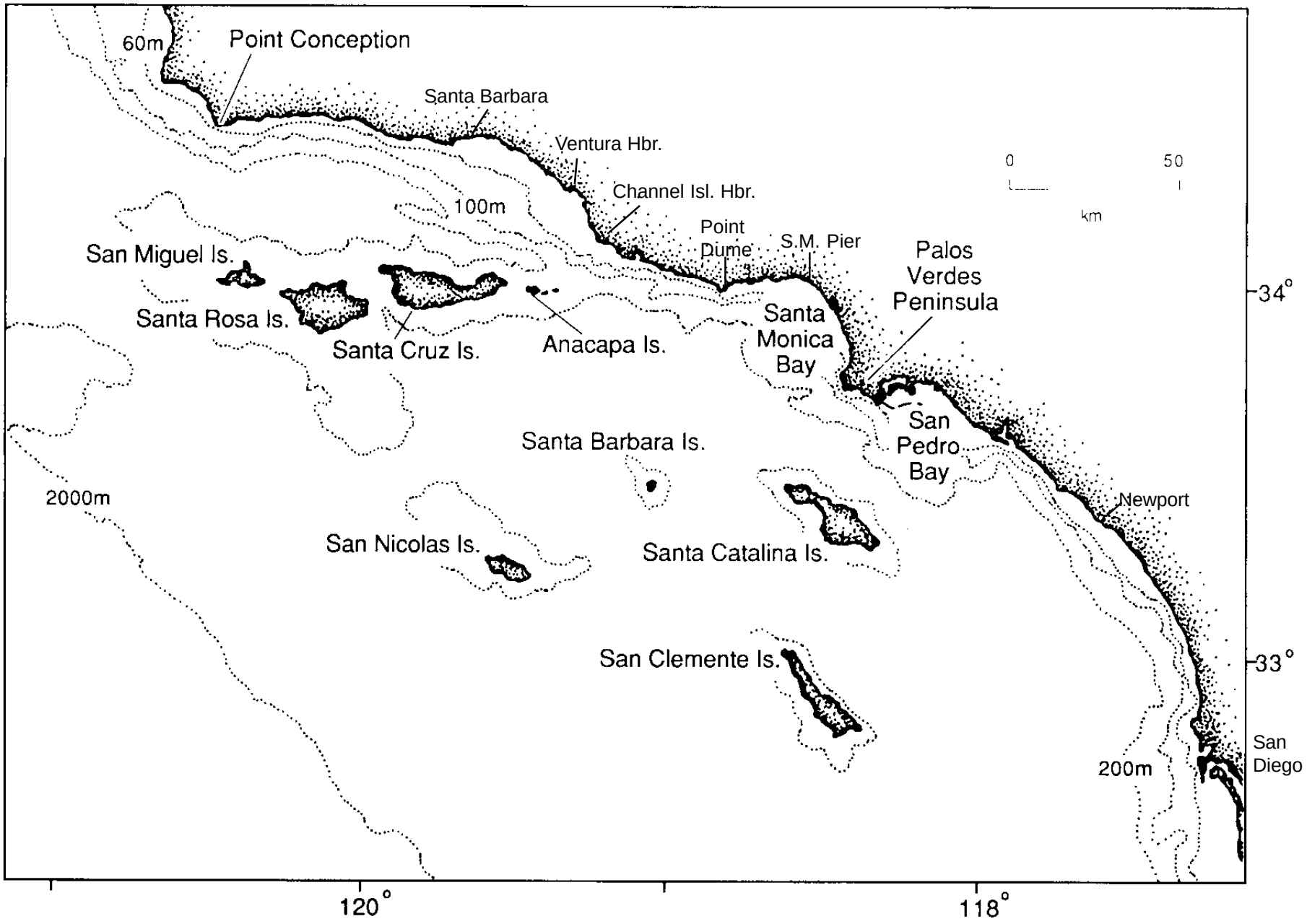
APPLICATIONS:

A. Pick out a few points along the southern California Bight and determine the distance and bearing between them!

B. Use a ruler and pencil to plot the positions of some of your waypoints on a chart or map.

C. Use a chart or map to find the coordinates of two locations that you might travel, such as from home to school, or from home to a favorite beach location. Determine the distance and bearing.

D. What might be different about using a GPS to navigate in your car on city streets as compared to using a GPS to navigate by boat on the open water? Explain.



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Some Southern California Bight Coordinates.

NOT Guaranteed for navigational purposes.

Anacapa Island East End	34 00.93	119 21.25
Avalon Bay, Catalina Island	33 20.83	118 19.42
Balboa Pier	33 35.08	117 54.02
Begg Rock, San Nicolas Island	33 21.92	119 41.90
Bird Rock, Catalina Island	33 27.07	118 29.17
Bishop Rock, Cortez Bank	32 26.90	119 07.80
Cardwell Point, San Miguel Island	34 01.33	120 17.50
Carrington Point, Santa Rosa Island	34 02.40	120 02.30
Catalina Island, West End Light	33 28.73	118 36.32
Channel Islands Harbor Entrance	34 09.30	119 13.67
Cavern Point, Santa Cruz Island	34 03.33	119 33.75
Dana Point	33 27.44	117 42.85
East End, San Clemente Island	32 48.92	118 21.25
Flat Rock Point, Palos Verdes	33 47.83	118 24.43
Hermosa Beach Pier	33 51.90	118 24.50
Long Beach Breakwater Entrance	33 43.45	118 11.00
Malibu Point	34 01.83	118 40.90
Marina del Rey N. Harbor Entrance	33 57.87	118 27.70
Newport Beach Harbor Entrance	33 35.30	117 52.63
Osborn Bank	33 21.60	122 22.82
Oceanside Harbor Entrance	33 10.73	117 24.00
Point Conception	34 26.80	120 28.10
Point Dume	34 00.00	118 48.28
Point Fermin Light	33 42.30	118 17.60
Point La Jolla	32 51.00	117 16.75
Point Loma, San Diego	32 39.80	117 14.50
Port Hueneme Harbor Entrance	34 08.60	119 12.80
Pyramid Cove, San Clemente Isl.	32 49.00	118 23.00
Santa Barbara Harbor Entrance	34 24.47	119 41.07
Santa Monica Lighted Whistle Buoy	34 00.20	118 30.20
Santa Rosa Island, East Point	33 56.50	119 57.60
Ventura Harbor Entrance, Buoy 2	34 14.30	119 16.90
Wilson Rock, San Miguel Island	34 06.31	120 23.76