



Cay Caulker Survey May 1993

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Cay Caulker Survey

Cay Caulker was surveyed on the 9th, 10th and 11th of May. The survey consisted of a perimeter of the south island, a partial perimeter of the north island, and a series of ground control points on easily identifiable features around the cays. In addition points were taken on the survey transects and in the northern cut.

Reference Position

Due to problems in locating an adequate survey point to use as a reference it was decided to make our own known point for the purposes of this survey. The following position is the average of 19648 fixes taken by the base station, which was placed on the roof of the local community centre, to provide elevation above the surrounding palm trees.

Latitude: 17°44'29.19"N

Longitude: 88°01'29.27"W

The co-ordinate system used throughout is WGS-84. The error on point features which contain more than 180 differentially corrected points is less than 2 metres, the error on line features is of the order 5 metres.

Survey Method

The Differential GPS system used was a Trimble Navigation Ltd. 6 Channel Pathfinder GPS, with a TDC-1 Data Logger as the rover unit, and a 4000 series base station. Two sorts of feature were logged, perimeters and ground control points (GCP). Where possible, perimeters were made by following the shoreline, within the constraints of satellite occlusion by vegetation, or difficulty of approach. Due to the presence of mangroves along some of the coast of the south cay, and along most of the northern cay it became necessary to trace the shoreline by using a boat, which followed the outer edge of the mangroves at a distance of 5-10 metres for the south island, and 3-5 metres for the north island lee side. Ground control points were generally taken on readily identifiable features such as island extremities, which can be easily located with accuracy both on the ground, and on aerial photography, or satellite imagery.

Data Reduction

Survey Data from the rover and base units was downloaded and differentially corrected using the Trimble Pathfinder software suite. This allows maps to be made, and will export into a variety of Geographical Information Systems (GIS) formats. Pathfinder automatically averages point feature (GCP) positions, but does not supply error estimates, for these averages in any readily accessible way. The quoted positions given here represent the average of the number of corrected fixes. As the differential correction process was not always completely effective, some positions may be less accurate than others, due to a smaller number of corrected fixes.

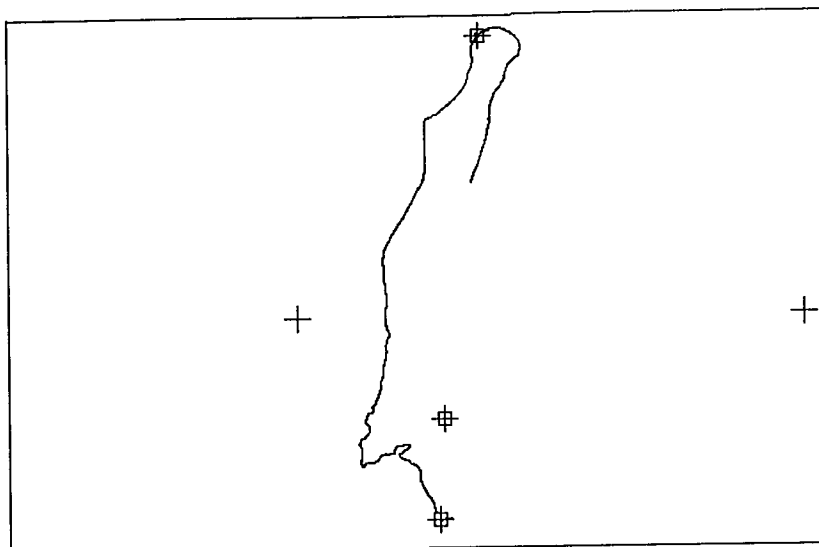
Sites Surveyed

The following sites were surveyed.

- 1) Cay Caulker South
- 2) Cay Caulker North
- 3) Transects

Cay Caulker North

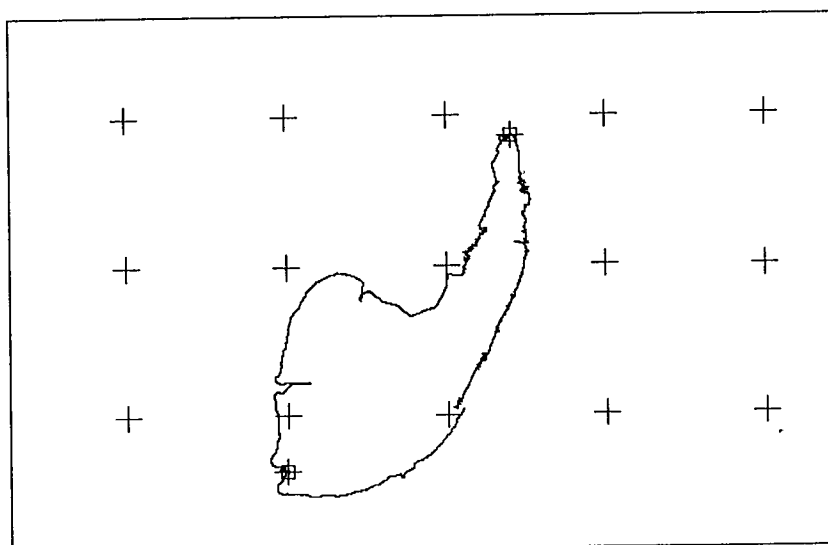
Diagram



This cay is predominantly mangrove. The west side has a deep channel between the mangrove roots and the seagrass beds of the lagoon. The perimeter was taken using a shallow draft boat taking one point every second, which averaged out at one point every 2 to 3 metres for the southern part, and one point every 5 to 10 metres in the northern part. Tick marks represent a scale of 5 km. The western perimeter follows the outer edge of the mangroves at an average distance of 3 metres, with most of the points at a distance of no more than 5 metres from the outer edge of the mangroves. The eastern side of the cay, which is incomplete, follows the outer edge of the mangroves at a distance of about 10-15 metres on average, due to the shallowness of the water. This section starts immediately after the northernmost point, which is marked by a box with a cross.

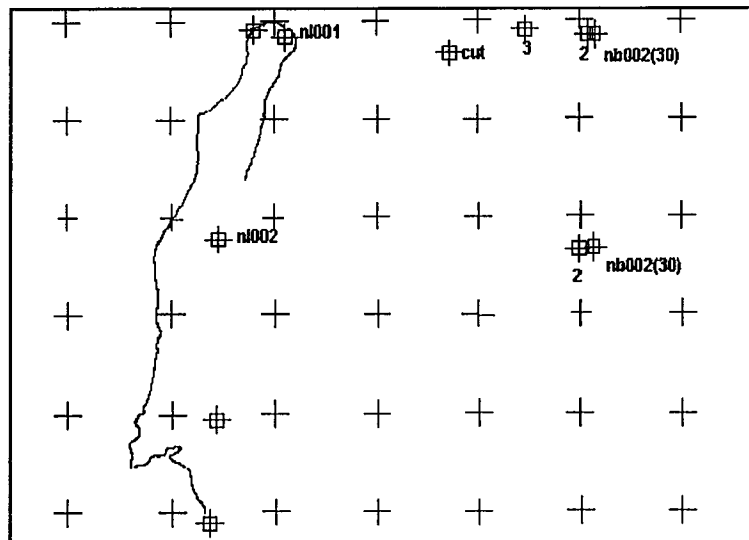
Cay Caulker South

Diagram



This cay was surveyed in two parts. The section along the east side from the northernmost point to about two thirds the way down the coast has been cleared of mangroves and was surveyed on foot. This section follows the shoreline, or sea wall, to within 1 metre. The rest of the coastline, most of which has not been cleared of mangrove, was surveyed in a shallow draft skiff. This followed the shoreline at a distance of about 5 to 10 metres, for the rest of the coast. Areas of interest on the above map include the join between the two datasets, which shows as a seaward shift of the perimeter line, and the jetty and canal on the western side. These two features were areas that had been cleared of mangrove, and so permitted close approach to the shoreline. The canal was a deep channel excavated alongside the airstrip, about 10 metres wide. Tick marks represent 100 metres, and two point features, marked by crossed boxes were taken.

Transect Diagram



Ground Control Points

Name	Time	Latitude	Longitude	Npt	PDOP	Description
North Point SI	07:58	17°45'01.59"N	88°01'27.68"W	200	2.0	Northernmost point South Cay.
South Point SI	10:42	17°43'48.71"N	88°02'15.36"W	200	2.2	Southernmost point South Cay, Jetty.
South Point NI	13:46	17°45'02.21"N	88°01'28.99"W	200	1.8	Southernmost point North Cay.
North Point NI	14:50	17°47'45.53"N	88°01'15.17"W	100	2.0	Northernmost point North Cay
Pier NI	15:21	17°45'36.19"N	88°01'27.06"W	100	2.0	Pier, North Cay, Half way down East side.

Transects

Transect	Time	Latitude	Longitude	Npts	PDOP	Dist
nl001	9:45	17 47 43.15	88 01 04.68	82	1.7	
nl002	10:14	17 46 35.89	88 01 26.53	200	1.8	
nb001(30m)	11:02	17 47 46.4	87 59 21.38	100	2.1	
nb002(30m)	11:51	17 46 33.05	87 59 22.9	100	2.2	
nb001(pt 2)	11:25	17 47 44.27	87 59 23.49	100	2.0	63
nb002(pt 2)	12:15	17 46 33.67	87 59 24.9	100	2.1	63
northern cut	10:00	17 47 37.9	88 00 09.5	30	2.0	
nb001(pt 3)	17:57	17 47 45.84	87 59 44.74	100	2.1	690 (640)

Time is the time the point was taken.

Npts is the number of corrected points averaged to make the coordinates.

PDOP is the Positional Dilution of Precision.

Dist is the distance in metres from the 30m contour to that point.