


1993

Movements and behavior of wild and head-started sea turtles

John A. Keinath

College of William and Mary - Virginia Institute of Marine Science

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Keinath, John Allen, Ph.D.

The College of William and Mary, 1993

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**MOVEMENTS AND BEHAVIOR OF
WILD AND HEAD-STARTED
SEA TURTLES**

**A Dissertation
Presented to
The Faculty of the School of Marine Science
The College of William and Mary in Virginia**

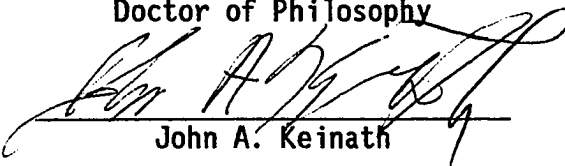
**In Partial Fulfillment
Of the Requirements for the Degree of
Doctor of Philosophy**

**by
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1993**

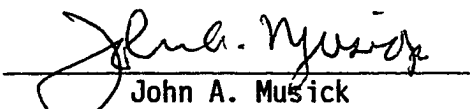
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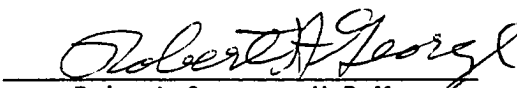
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the requirements for the degree of

Doctor of Philosophy



John A. Keinath


Approved, July 1993


John A. Musick
Committee Chairman/Advisor


Robert George, V.D.M.


Evon Ruzicki, Ph.D.


Richard Wetzel, Ph.D.


James R. Spott, Ph.D.
Drexel University
Philadelphia, Pennsylvania

Dedicated to Dad, who always supported my endeavors.

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ABSTRACT

Flipper-tagging, aerial surveys, and satellite telemetry was used to investigate the occurrence, migratory routes, distances traveled, swimming speeds, diving behavior, and the relation of water temperature to movements and timing of migration of wild loggerhead (Caretta caretta) and Kemp's ridley (Lepidochelys kempii) sea turtles. The behavior and movements of head-started loggerhead turtles was investigated with satellite telemetry and compared to wild turtles.

Flipper-tagged loggerhead and Kemp's ridley turtles inhabit Chesapeake Bay during the warm months and many return in subsequent seasons. Aerial surveys showed that loggerhead turtles migrate from south of Cape Hatteras to northern waters during May and June, and return to the south of Cape Hatteras in the autumn, usually during October or November. Satellite telemetry supported aerial survey data, and showed that loggerhead and Kemp's ridley turtles migrate nearshore to the south of Cape Hatteras in the autumn, although one loggerhead became pelagic in the North Atlantic. Kemp's ridleys and some loggerheads migrate as far south as Florida for the winter months, while some loggerheads overwinter in the Gulf Stream off North Carolina. Loggerheads which returned to Chesapeake Bay used similar migratory routes during the northerly and southerly migrations.

Loggerhead and Kemp's ridley turtles spent up to 94% of 12 h periods submerged (ridley mean = 81%, loggerhead mean = 88%), and mean dive durations ranged from 13 to 124 min (ridley mean = 66 min, loggerhead mean = 74 min), making 13 to 38 dives over a 12 h period (ridley mean = 25, loggerhead mean = 25). Temperatures measured by satellite transmitters attached to Kemp's ridley turtles ranged from 13 - 23 C (mean = 17 C), while loggerhead temperatures ranged from 6 - 33 C (mean = 20 C). Movements of turtles appear to be mitigated by temperatures about 15 C.

Movements and diving behavior of head-started loggerheads were different than wild turtles. Some head-started turtles entered the Gulf Stream and traveled eastward across the Atlantic, while others wandered in various directions. Head-started loggerheads made more (mean = 69) and shorter dives (mean = 21 min) over a 12 hr period than wild turtles, and spent significantly less time submerged (mean = 54%) than wild turtles.

MOVEMENTS AND BEHAVIOR OF WILD AND HEAD-STARTED SEA TURTLES

INTRODUCTION

Sea turtles are the most migratory extant reptiles. Leatherbacks (*Dermochelys coriacea*) travel over 3000 km between Caribbean breeding grounds and temperate feeding areas (Bleakney, 1965; Boulon et al., 1988; Goff and Lien, 1988; Keinath and Musick, 1990; Lambie, 1983; Lazell, 1980; Pritchard, 1976; Rhodin and Schoelkopf, 1982). Green turtles (*Chelonia mydas*) migrate from Ascension Island nesting beaches to South American feeding areas and from Costa Rican nesting beaches to Caribbean feeding grounds (Carr, 1967). These point to point migrations were discovered by flipper tagging, yet virtually nothing else is known of sea turtle migration, especially juvenile turtle movements.

Chesapeake Bay is an important foraging habitat for juvenile loggerhead (*Caretta caretta*) and Kemp's ridley (*Lepidochelys kempii*) sea turtles during warmer months (Byles, 1988; Bellmund et al., 1987; Keinath and Musick 1991a, 1991b; Keinath et al., 1987, 1991; Lutcavage, 1981; Lutcavage and Musick, 1985; Musick et al., 1985a). Aerial survey data (Barnard et al., 1989; CeTAP, 1982a, 1982b; Keinath et al., 1987, 1992; Shoop, 1987; Shoop and Kenney, 1992; Shoop et al., 1981) suggested loggerheads migrate nearshore to and from south of Cape Hatteras, North Carolina each spring and fall: Turtles enter the bay in May and June and exit the bay when water temperature undergoes a pronounced decrease,

usually caused by northeastern storms which occur in October or November (Bellmund et al., 1987; Keinath et al., 1987; Lutcavage and Musick, 1985; Musick, 1988; Musick et al., 1985b).

Flipper tags have traditionally been used to track sea turtles over long periods of time, and the remarkable navigational abilities of Ascension Island green turtles were revealed via this method. But flipper tagging only discloses point to point movement, and usually only nesting females are studied. Chesapeake Bay is one of the few areas where juvenile loggerhead and Kemp's ridley sea turtles have been tagged in any numbers, and subsequently recaptured (Byles, 1988; Sauls et al., 1990).

Aerial surveys have been flown by VIMS personnel since 1982 to estimate loggerhead turtle populations in Chesapeake Bay. Results from the surveys indicate that up to 9,000 loggerheads inhabit the bay each summer (Byles, 1988; Keinath et al., 1987). Surveys have also been flown over coastal Virginia and North Carolina since 1985 (Keinath et al., 1987, 1992; Musick, 1986; Musick et al., 1987, 1989). In addition, surveys were flown between Oregon Inlet and Hatteras Inlet during 1991-1992.

Recently, satellite telemetry has been used to track sea turtles, and concurrently collect information on swimming behavior and ambient water temperature (Byles, 1988; Keinath, 1991; Keinath et al., 1989). Satellites receive signals from transmitters and relay the data to earth stations. The satellite determines position of the transmitter by doppler shift, and other parameters can be measured by sensors in the transmitter.

Wild sea turtles

The coastal area from Cape Hatteras, North Carolina to Virginia is

a major migratory pathway for loggerhead, leatherback, and Kemp's ridley sea turtles (CeTAP, 1982a, 1982b; Shoop and Kenney, 1992; Shoop et al., 1981). During spring, turtles migrate from the south past Cape Hatteras to summer in northern waters. Juvenile loggerheads and ridleys enter estuaries such as Chesapeake Bay, Long Island Sound, and Cape Cod Bay, while the leatherbacks travel as far north as Newfoundland and possibly farther (Bleakney, 1965; Danton and Prescott, 1988; Keinath and Musick, 1991a, 1991b; Keinath et al., 1987, 1989, 1991; Goff and Lien, 1988; Lazell, 1980; Lutcavage and Musick, 1985; Morreale and Standora, 1989; Morreale et al., 1992; Musick, 1988; Musick et al., 1985a, 1985b, 1987; Shoop, 1980). When water temperatures fall in the autumn, turtles return to south of Cape Hatteras to overwinter.

Head started turtles

Egg and hatchling sea turtle predation is very high, with an estimated 0.01 to 0.1% of hatchlings surviving to reproduce (Frazer, 1986). Raising sea turtles in captivity to a size larger than can be taken by most marine predators (head-starting) may increase the probability that turtles may survive to reproduce. Until relatively recently, head-starting sea turtles has been an accepted and encouraged practice throughout the coastal southeast states (Allen, 1992; Frazer, 1992; Taubes, 1992; Woody, 1990, 1991).

The best example is the Kemp's ridley head-start program. The primary (20 km) nesting beach was unknown to science until in 1950 when a film made in 1947 was made available and showed over 40,000 turtles nesting in one day (Hildebrand, 1963). By the 1960's egg, meat, and leather poachers drastically reduced the nesting population. In 1966 a joint Mexican/US team started collecting and incubating eggs in protected areas. The steady decline of nesting females (presently less

than 500 per year) persuaded the US National Marine Fisheries Service and US Fish and Wildlife Service (USFWS) to initiate a head-start program in Galveston, Texas which is still in operation. Approximately 1500 eggs per year are hatched, raised for one year, and the dinner plate size turtles are released into the Gulf of Mexico. Although tremendous time, effort, and money has been spent on this and many other head-start projects, not one head-started turtle has been observed nesting in the wild, and little effort has been expended to study the behavior of the turtles after release. Suggested reasons why head-started turtles do not return to nest are varied, including lack of antipredator response, no navigational abilities, and altered homing response; all of which are possible products of the unnatural environment inherent in the head-starting process. Conversely for loggerhead turtles, most of the head-started turtles may not have yet reached sexual maturity which may not occur for 15 to 30 years (Klinger, 1988). Because of the lack of observations of nesting head-started sea turtles (and potential failure of the procedure), most US head-start projects have been discontinued (Taubes, 1992), although the reasons for this lack of observed nesting has not been addressed.

OBJECTIVES

The objectives of the present study were:

- 1) To describe the occurrence, migratory routes, distances traveled, swimming speeds, diving behavior, and the relation of water temperature to movements and timing of migration of wild loggerhead (Caretta caretta) and ridley (Lepidochelys kempji) sea turtles off the coast of the south-east United States utilizing 1) recaptures of flipper tagged turtles from 1979 - 1992, 2) aerial surveys, and 3) satellite telemetry.

- 2) To compare diving behavior and movements, measured with satellite telemetry, of head-started loggerheads to wild loggerheads to gain insight into the effectiveness of head-starting in producing viable sea turtles.

MATERIALS AND METHODS

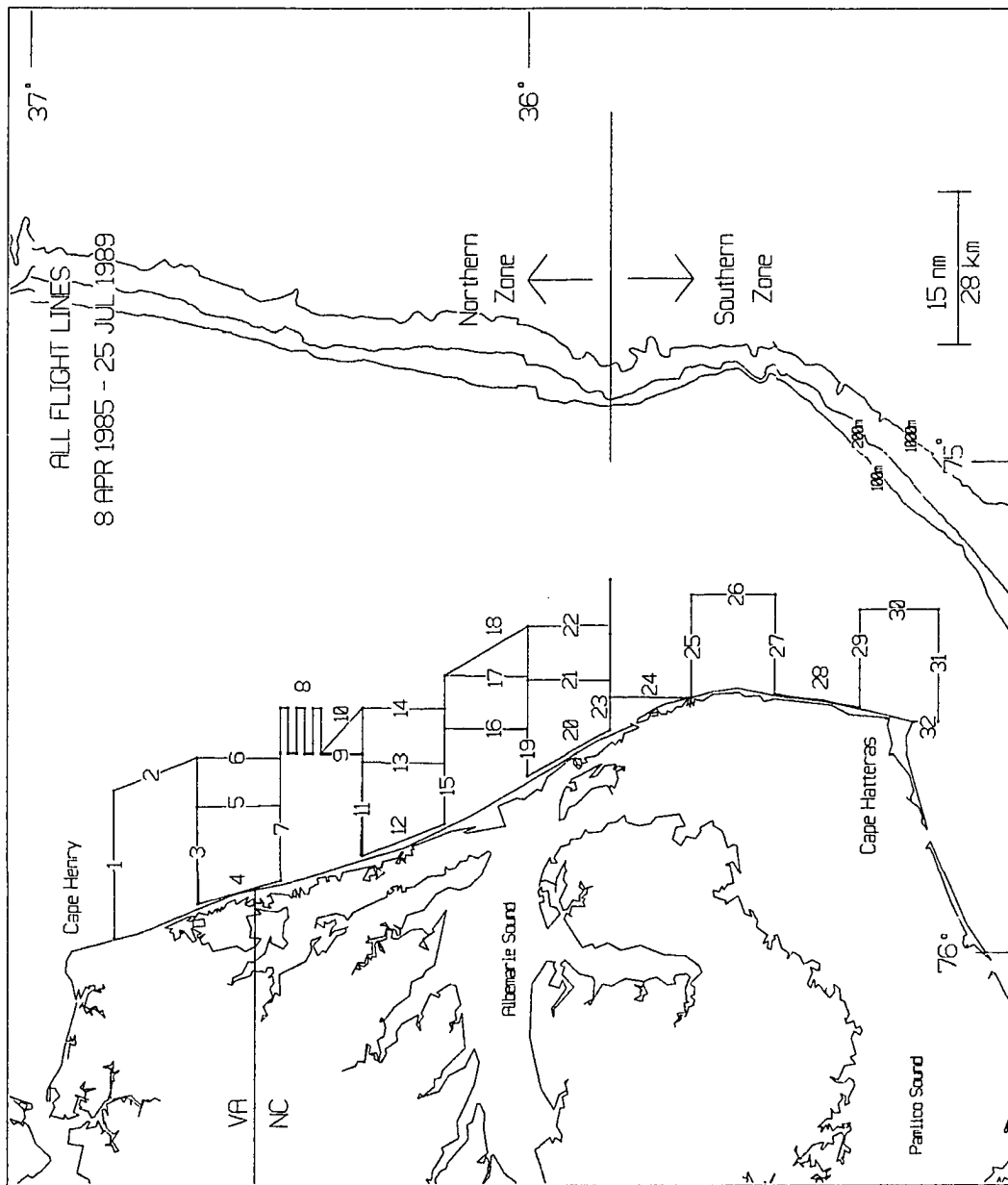
Flipper tagging

Live turtles were obtained from various sources: cooperating pound net fishermen, recreational fishermen who inadvertently catch turtles, cold stunned individuals, nesting females, and from VIMS trawl surveys. Turtles were flipper-tagged (with metal tags supplied by the University of Florida or the National Marine Fisheries Service), weighed, measured, and released (some of these individuals were also fitted with satellite transmitters). Turtles were either recaptured in subsequent seasons in Virginia and reported to the VIMS stranding program or recaptured in other areas and reported to the NMFS's Sea Turtle Stranding and Salvage Network (STSSN), who relayed the information to VIMS.

Aerial surveys

The VIMS Sea Turtle Research Project has conducted aerial surveys covering the area between Cape Henry to Cape Hatteras since 1985 (Figure 1) to estimate density of loggerhead turtles in the area (Keinath et al., 1987). In 1991 surveys were initiated from approximately Oregon Inlet to Hatteras Inlet. Three areas were surveyed; from 55.5 km to 18.5 km north of Cape Hatteras (northern zone), from 18.5 north to 18.5 km south of Cape Hatteras (middle zone), and from 18.5 to 55.5 km south

Figure 1. Aerial survey transects flown during 1985 - 1989. Various lines were surveyed on each flight. The transects were divided into northern and southern zones. Numbered lines correspond to data presented in Appendix 1.



of Cape Hatteras (southern zone) (Figures 2 and 3). Following our established protocol (Bellmund et al., 1987; Byles, 1988; Keinath et al., 1987; Musick et al., 1985a, 1985b) surveys were flown at an altitude of 152 m, and at a speed of 130 km/hr. Two observers, one on each side of the plane, scanned the sea surface for turtles and other sea creatures. When an animal was sighted, the following data were taken:

- 1) Sighting angle from the transect line
- 2) Time of observation
- 3) Species

The sighting angle was used to determine the distance each animal was from the transect line. Since turtles are rarely sighted under the airplane (0-50 m) and sighting efficiency drops off dramatically beyond 300 m (Figure 4), the effective visual swath being surveyed is 250 m on each side of the plane. Thus density of turtles can be calculated as:

$$D = N / A$$

where D = density of turtles observed

N = number of turtles observed

A = area surveyed

and:

$$A = (O * W) * L$$

where O = number of observers (2 in the present study)

W = survey strip width (250 m in this study)

L = length of survey line

Thus, for this study

$$D = N / (0.5 \text{ km} * L)$$

Byles (1988) compared this method to a more complicated Hermite polynomial function (Burnham et al., 1980) which accounts for turtles at

Figure 2. Aerial survey zones flown during 1991 - 1992. Attempts were made to survey all three zones on each flight. N = northern zone, M = middle zone, S = southern zone.

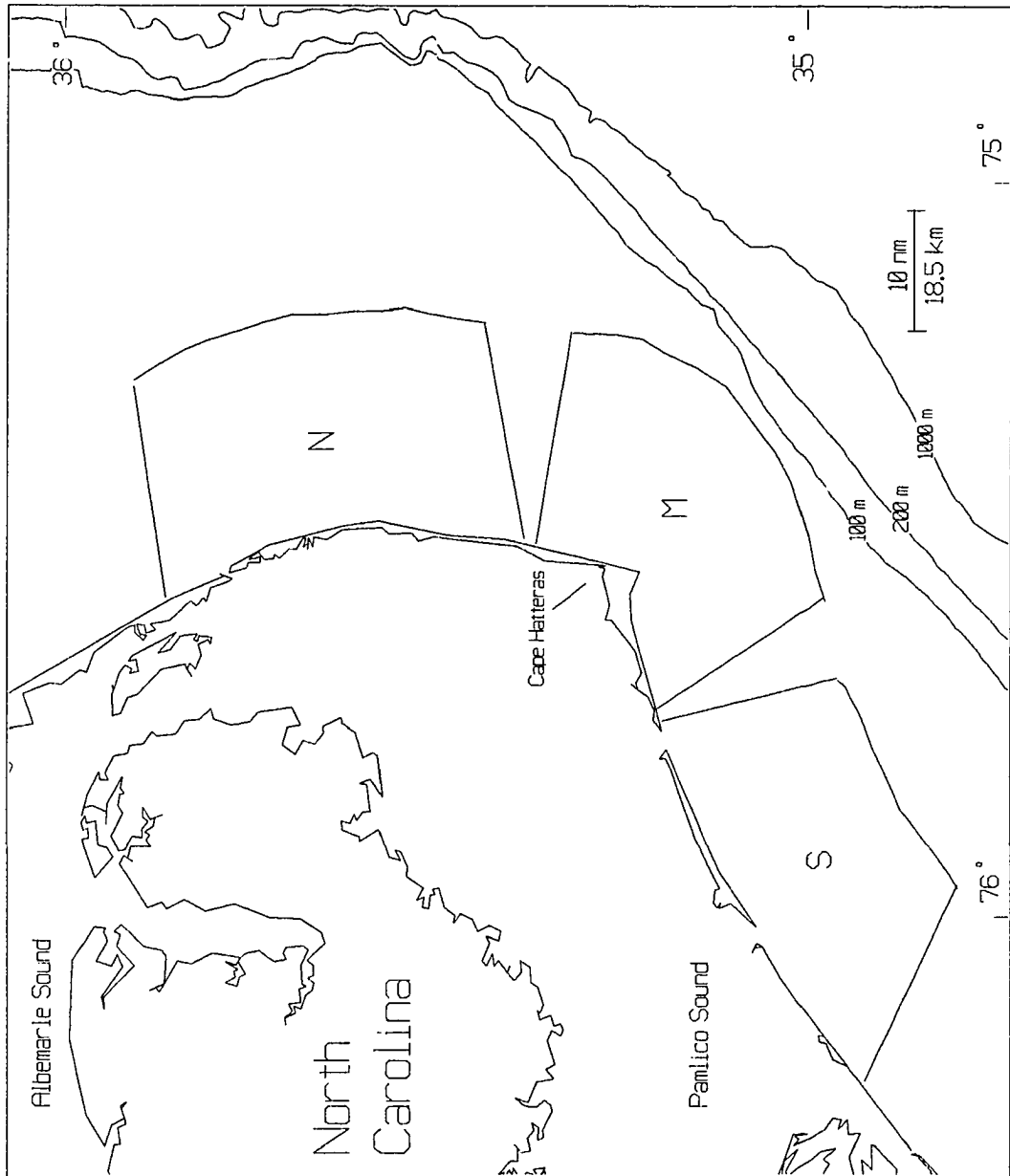


Figure 3. Aerial survey transects flown during 1991 - 1992.

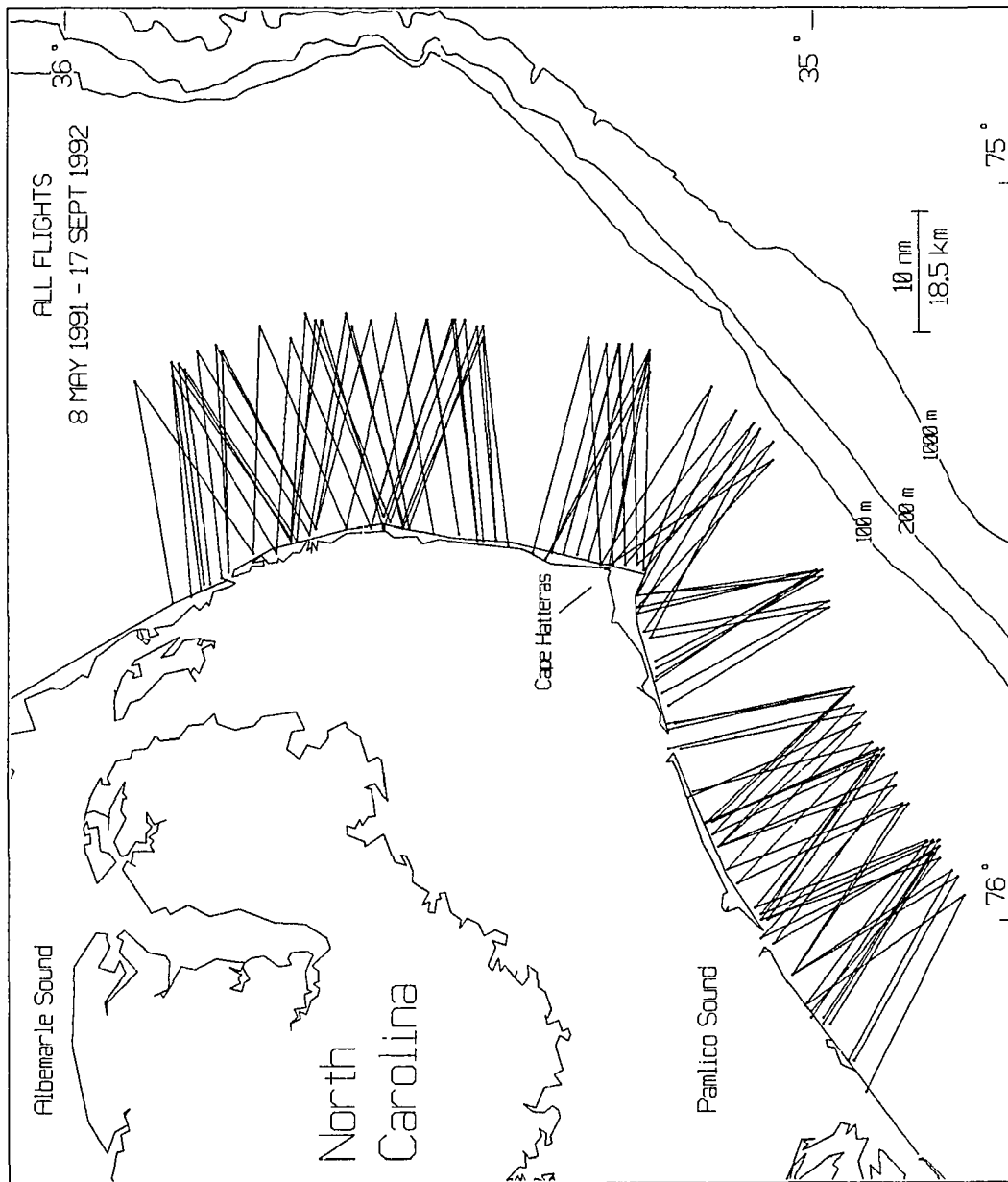
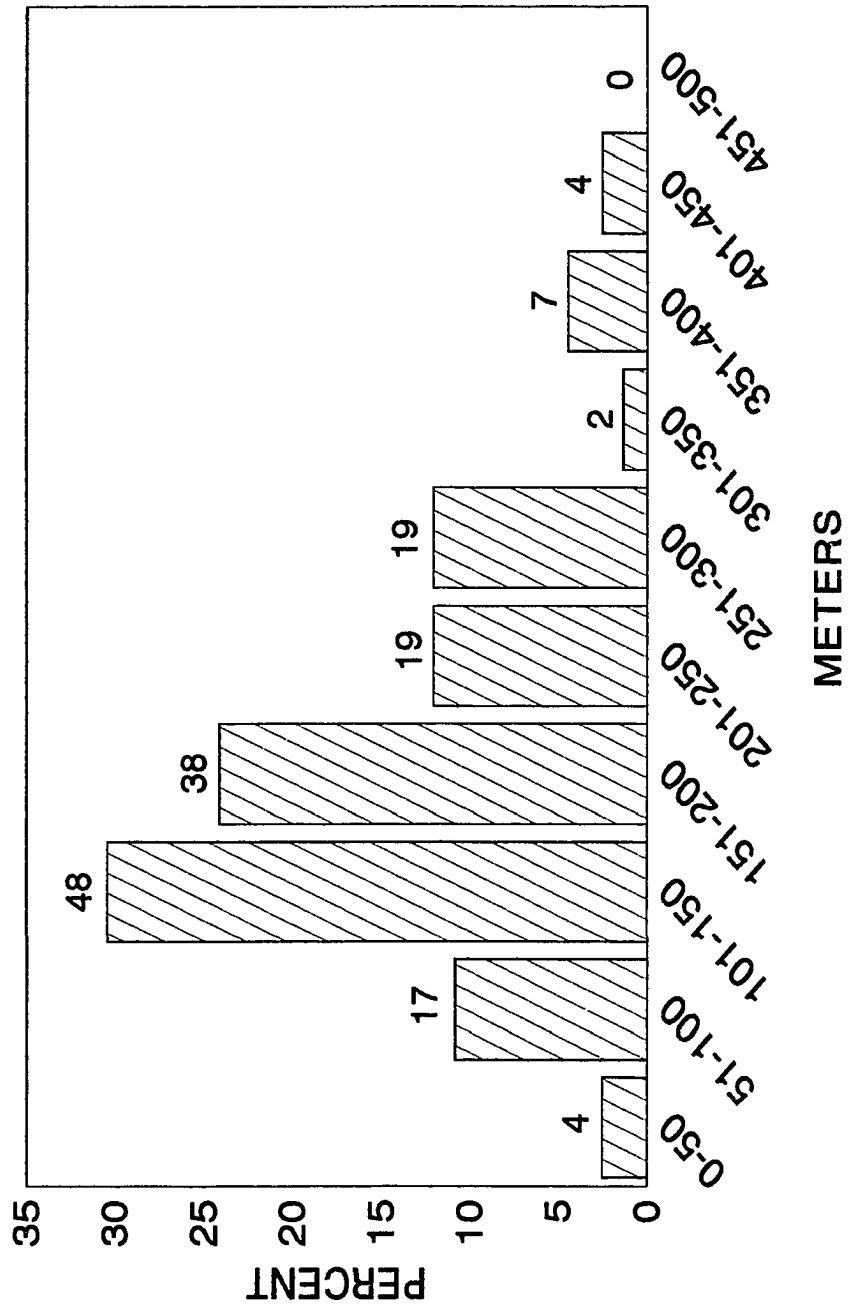


Figure 4. Percentage of sea turtles observed as a function of distance from the flight path on 1991 - 1992 surveys. Leatherback turtles excluded. Number of turtles observed over bars.

Turtles Observed By Distance From Flight Line



the surface but not seen by observers, and found that both methods produced similar results (eg. means of 423 vs 372 turtles in his study area). Thus I chose to use this simpler method to calculate turtle densities. Each of the six lines in each zone was used to calculate the mean and standard deviation of densities by flights flown in 1991 - 1992.

Since only turtles at the surface of the water are observed on aerial surveys, a correction factor must be used to account for submerged turtles (Bellmund et al., 1987; Byles, 1988; Keinath, 1986; Keinath et al., 1987; Musick et al., 1985a, 1985b, 1992; Standora et al., 1984). If the amount of time a turtle spends at the surface is known, an adjustment factor can be calculated as the inverse of the proportion of time spent at the surface (Keinath, 1986; Musick et al., 1985a). By multiplying this factor by the relative density values for the submerged turtles, an estimated population density may be obtained. The diving data required to calculate the adjustment factor were obtained from satellite telemetry. Estimated standing stocks were calculated for each of the zones by multiplying the estimated population densities by the areas of each zone (north = 1527.4 km², middle = 891.9 km², south = 1216.0 km²)

Satellite telemetry

Satellite telemetry uses UHF transmitters which transmit signals to a satellite which in turn relays them to an earth station. The Argos satellite telemetry system utilizes NOAA Tiros satellites to calculate transmitter location by doppler shift of the transmitter's radio frequency (Kenward, 1987), and also allows transmission of digital data collected by transmitter sensors. Data collected by on board sensors included water temperature and diving data: mean dive duration in a 12 h

period and number of dives in that 12 h period (Byles, 1989; Byles and Dodd, 1989; Keinath, 1991; Keinath et al. 1989). A salt water switch was used to determine these dive parameters, and the switch also served to turn off the transmitter while underwater (UHF radio waves do not travel through seawater) to extend the battery life from 25 - 30 days to up to a year of operation. Because waves breaking over the sea water switch would give erroneous dive data, submersions under one minute were disregarded. Data was transmitted from satellites to ground stations, and processed and disseminated by Argos (Byles and Keinath, 1991). Data was accessed via computer and modem, and back up diskettes or print-outs of monthly data were available from Argos. Location, parameters sent by the transmitter, day and time of reception, and probability of location accuracy are among data received. From this dive data the duration of time spent submerged and percentage of time spent submerged in each 12 h segment was calculated.

In contrast to radio and sonic telemetry which can provide continuous data, the Argos system provides only a limited number of daily fixes, depending on latitude (Kenward, 1987). Since Tiros satellites are polar orbiting, more fixes are possible at higher latitudes (up to 15 per day) than at the equator (up to seven per day), and since the transmitter is below the surface most of the time, probability of receiving a location is decreased further. Up to two fixes per day were received from wild loggerhead turtles tracked off the east coast of the US, although there were occasions when no positions are recorded for days. The Argos system was used to track three wild Kemp's ridley, eight wild loggerhead, and seven head-started loggerhead sea turtles (one 3 yr and six 2 yr olds; see Swingle et al., 1991).

Argos compatible satellite transmitters were attached to selected

wild and head-started turtles following established protocol. Migration routes were plotted and distances traveled and speeds were calculated. Temperatures obtained from the transmitters were used to identify temperature tolerance, preferred temperature, and the temperature ranges which mitigated movement. For turtles which made significant north-south migrations, latitude and transmitter temperature versus date were graphed. Diving parameters were compared between the two wild species and between wild and head-started loggerheads utilizing analysis of variance if the data met parametric statistical assumptions, otherwise Kruskal Wallis nonparametric analysis of variance was utilized. Significant differences were further analyzed with multiple range comparisons (SPSS, 1986, Siegel and Castellan, 1988).

RESULTS

Flipper tagging

Between 1979 and 1992, 421 loggerheads from Virginia's waters were flipper-tagged. Four loggerheads were subsequently recaptured outside Virginia (Table 1), while 48 were recaptured in Virginia in subsequent (but not necessarily consecutive) seasons (Table 2). Thirteen loggerheads tagged outside Virginia were recovered in Virginia's waters (Table 3). Although the majority of loggerheads tagged in Virginia were only recovered in one subsequent season, some loggerheads have been observed for up to four seasons (Table 2, Figure 5).

Of 57 Kemp's ridleys tagged from Virginia's waters, two were recaptured in Virginia's waters in subsequent seasons, and three were recovered outside Virginia. Three ridleys tagged elsewhere were captured in Virginia (Table 4).

Table 1. Loggerhead sea turtles flipper-tagged in Virginia and subsequently recaptured elsewhere, 1979-1992.

<u>Virginia</u>		<u>Elsewhere</u>	
<u>Tag Date</u>	<u>Release Location</u>	<u>Recapture Date</u>	<u>Recapture Location</u>
12 Jun 81	Va. Beach	19 May 82	Sneeds Ferry, NC
1 Jun 84	Va. Beach	20 Sep 84	Delaware Bay
26 Sep 87	York River	Oct 87	Nags Head, NC
18 Sep 91	Va. Beach	14 Oct 91	Pamlico Sound, NC

Table 2. Loggerhead sea turtles flipper-tagged and recaptured in subsequent years in Virginia, 1979-1992.

Release Date	Release Location	Recapture Date	Capture Location	Tag Number
24 Jun 80	Potomac River	10 Jun 91	Mathews Co.	K487
30 Jul 80	York River	5 Jun 81	York River	G1010
7 Aug 80	Potomac River	27 Jun 82	Mathews Co.	K727
24 Jun 81	York River	15 Aug 82	Virginia	K595
10 Oct 81	Cape Henry	25 May 83	Hampton	G1013
9 Sep 81	York River	25 Sep 82	Hampton	G1017
7 Oct 82	Hampton	29 Jun 83	Hampton	
14 Sep 81	Mathews Co.	7 Jun 83	Mathews Co.	K2003
16 Sep 82	York River	22 Jun 83	York River	K2751
20 Sep 82	Potomac River	1 Jul 83	Potomac River	K2187
1 Jul 83	Potomac River	3 Jul 84	Potomac River	
23 Jul 84	Potomac River	6 Jun 85	Potomac River	
19 Jun 85	Potomac River	18 Jul 87	Potomac River	
Oct 82	Virginia	28 Jul 83	Mathews Co.	K2008
30 Jun 83	Mathews Co.	30 May 85	Mathews Co.	K2096
15 Jun 84	Potomac River	19 Jun 85	Potomac River	K4653
Jul 84	Potomac River	15 May 85	Mathews Co.	K2764
26 May 85	Ches. Bay Mouth	8 Jun 86	Talbot Co., MD	
4 Jul 84	Potomac River	22 Jul 87	Potomac River	K4609
14 Sep 87	Potomac River	13 Sep 88	Potomac River	
13 Aug 84	Potomac River	21 Jun 85	Potomac River	K4638
7 Aug 86	Potomac River	29 Jun 87	York River	
20 Jul 87	Potomac River	7 Jun 88		
13 Aug 84	Potomac River	21 Jun 85	Potomac River	K4636
13 Aug 84	North Carolina	8 Jul 87	Potomac River	K4640
1 Nov 84	Cape Charles	summer 85	Cape Charles	G1055
13 Jun 84	unknown	6 Jun 85	Potomac River	K4696
6 Jun 85	Potomac River	25 Aug 87	Potomac River	

Table 2. Continued.

Release Date	Release Location	Recapture Date	Capture Location	Tag Number
20 Jun 84 28 Jun 85	unknown Potomac River	28 Jun 85 summer 87	Potomac River Potomac River	K2774
2 Jul 85	Potomac River	27 Jul 87	Potomac River	K4100
12 Sep 85	York River	29 Sep 86	Potomac River	K4562
2 Oct 86	York River	21 Sep 87	Potomac River	K6419
19 Aug 86	Off Bay Mouth	16 Jun 87	Potomac River	K6426
15 Oct 86 29 Jul 87	York River York River	22 Jun 87 11 Jun 88	Potomac River Potomac River	G1060
2 Oct 86	Va. Beach	10 Jul 87	Potomac River	K6421
15 Oct 86	York River	29 Jun 87	Potomac River	K6432
6 Aug 87 18 Sep 88	York River York River	2 Jul 88 4 Jul 89	Potomac River Potomac River	PPN130
30 Jul 87	Potomac River	19 Jul 88	Potomac River	PPN140
29 Jul 87	York River	10 Jun 88	Middlesex Co.	PPN180
14 Aug 87	York River	11 Jul 88	Potomac River	PPN211
14 Aug 87	York River	15 Aug 88	Potomac River	PPN209
12 Aug 87	Cape Charles	19 Jul 88	Potomac River	PPN165
9 Sep 87	Rappahanock River	22 Jun 88	Potomac River	PPN234
7 Sep 87 13 Aug 88	Rappahanock River York River	13 Aug 88 20 Jun 89	Potomac River Potomac River	PPN242
21 Jul 88	York River	24 Jul 89	Potomac River	PPN222
24 Aug 88	Va. Beach	25 Sep 89	Potomac River	PPX735
11 Sep 88	York River	16 Oct 89	Potomac River	PPX751
11 Sep 88	York River	12 Jun 89	Potomac River	PPX779
12 Jun 89	York River	5 Jun 91	Norfolk	PPX860
24 May 90	York River	19 Jun 91	Potomac River	QQB413
15 Jun 90	York River	12 Jun 92	Potomac River	QQB476

Table 2. Continued.

Release Date	Release Location	Recapture Date	Capture Location	Tag Number
5 Jun 90	York River	30 May 91	Potomac River	QQB478
1 Jul 91	York River	4 Aug 92	Potomac River	
10 Jul 90	York River	31 Jul 91	Va. Beach	QQB486
25 Aug 90	Va. Beach	14 Jun 91	Potomac River	QQB426
17 Aug 91	Va. Beach	11 Sep 82	Potomac River	QQM656
23 Oct 91	Va. Beach	17 Aug 92	Potomac River	QQM7000

Table 3. Loggerhead sea turtles flipper-tagged outside Virginia and subsequently recaptured in Virginia's waters, 1979-1992.

<u>Original</u>		<u>Virginia</u>	
Tag Date	Tagging Location	Recapture Date	Recapture Location
18 Mar 80	Cape Canaveral, FL	6 Jun 81	Virginia
6 Jun 81	Wassaw Is., GA	31 Jul 83	Cape Charles
Original tag date & location unknown		6 Jul 82	Norfolk, VA
3 Feb 82	Cape Canaveral, FL	14 Jul 82	Mathews Co.
23 Jun 82	Melbourne Beach, FL	10 Aug 88	Cape Charles
26 Jul 85	Melbourne Beach, FL	24 Jul 85	Va. Beach
31 Dec 86	Cape Canaveral, FL	3 Jun 91	Middlesex Co.
30 Apr 87	Hutchinson Isl., FL	7 Jun 90	Cape Charles
28 Jan 88	Hutchinson Isl., FL	9 Jun 89	Potomac River
11 Jul 90	Suffolk Co., NY	20 May 91	Va. Beach
28 Mar 91	Hutchinson Isl., FL	4 Jul 92	Va. Beach
unknown	GA	20 Jul 92	Chincoteague
12 Aug 86	Cape Canaveral, FL	6 Aug 92	Va. Beach

Figure 5. Number of loggerhead sea turtles flipper-tagged in Virginia and recaptured in Virginia in subsequent (but not necessarily consecutive) seasons, 1979 - 1992.

Turtles Recaptured in Subsequent Years

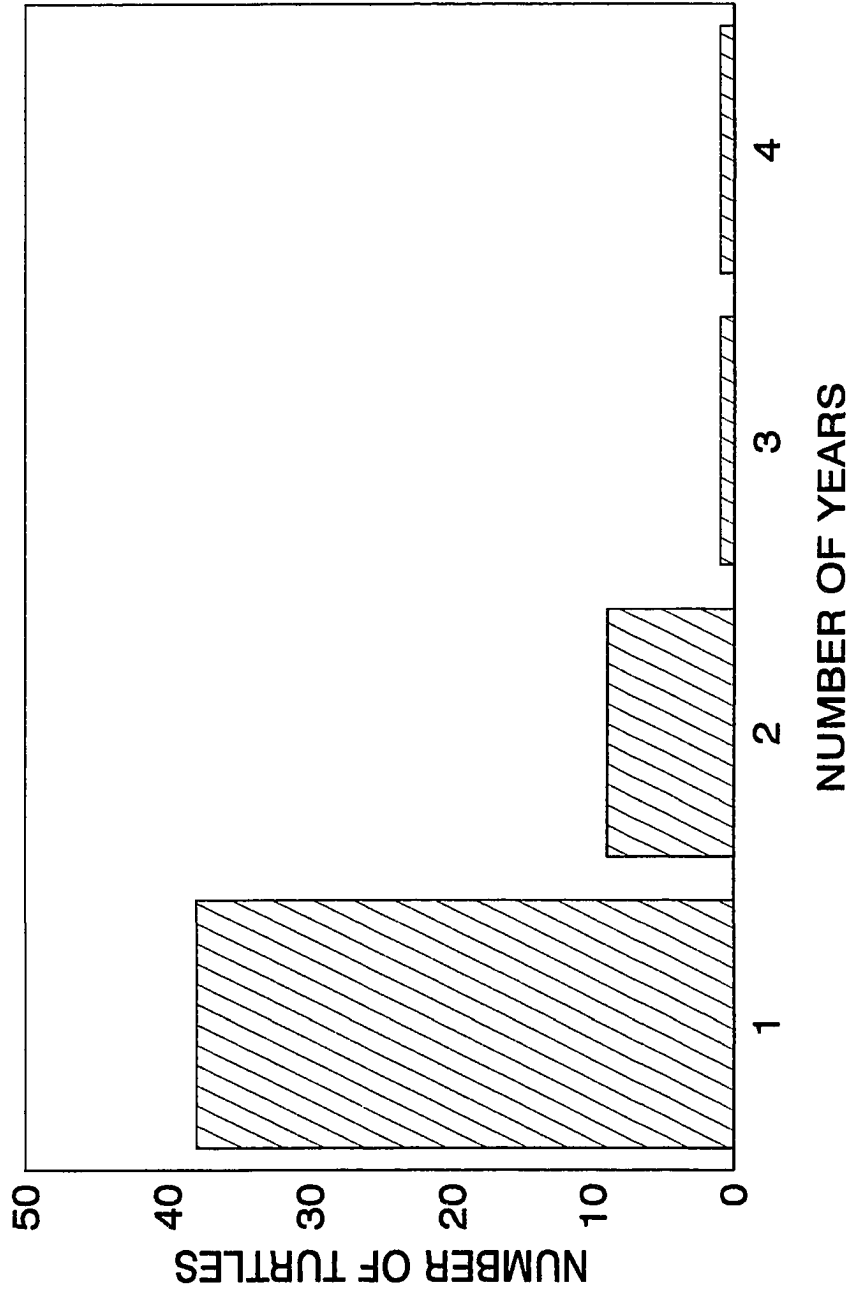


Table 4. Flipper tagged Kemp's ridley sea turtles which have subsequently been recaptured, 1979-1992. * = Satellite tagged ridley (4939).

Release Date	Release Location	Recapture Date	Recapture Location
<u>Tagged in Virginia</u>			
28 Jul 81	York River	29 Apr 82	Bogue Bank, NC
10 Jun 88	York River	25 May 89	Potomac River
26 Sep 88	York River	26 May 90	Potomac River
19 Jun 89	York River	12 Jan 91	St. Johns Co., FL
28 Oct 91*	Va. Beach	4 Jun 92	Cape Canaveral, FL
<u>Tagged elsewhere</u>			
9 May 79	Florida	1 Jul 80	York Co.
4 Feb 81	Florida	25 Aug 81	Va. Beach
17 Nov 87	Massachusetts	28 Oct 91	Va. Beach

Aerial surveys

Eleven surveys were flown during 1985, nine in the northern zone and two in the southern zone (Table 5, Figure 6, Appendix 1). During the end of April, more loggerheads were observed in the southern than the northern zone. Of all the surveys, most loggerheads were observed during early May in the northern zone, but by late May few turtles were observed in the northern zone. During August, loggerheads became more abundant in the northern zone, but became less abundant by September. During October and November turtles again became more abundant in the northern zone than in September, and in November, abundance decreased in the northern zone while abundance in the southern zone increased.

Twenty surveys were flown during 1986, 15 in the northern zone and five in the southern zone (Table 5, Figure 7, Appendix 1). On 30 April both zones were surveyed and more loggerheads were observed in the southern zone, while on 7 May turtles were more abundant in the northern zone. Turtles became very abundant in the northern zone during late May, and few were observed in mid-June. Throughout the rest of the year abundance fluctuated.

From 1987 through 1989 ten surveys were flown, eight in the northern zone and two in the southern zone (Table 5, Figure 8, Appendix 1). Turtles were observed in the northern zone on 16 September 1987, but no turtles were seen in the southern zone on 3 December. During 1988 turtle abundance was high in early June, then decreased until late July when a large concentration of turtles was observed in the area. Turtle abundance again decreased in August and October. Two surveys were flown in 1989, one each in the northern and southern zone on 25 July. Although few, equal numbers of turtles were observed in each zone.

Table 5. Estimated density of loggerhead turtles in the two zones surveyed during 1985 - 1989 (Figure 1), in turtles km⁻². ESD = estimated surface density; EPD = estimated population density.

DATE	Northern zone		Southern zone	
	ESD	EPD	ESD	EPD
18 Apr 1985			0.411	3.863
26 Apr 1985	0.115	1.081		
1 May 1985	1.261	11.853		
2 May 1985	0.586	5.504		
25 May 1985	0.045	0.423		
6 Aug 1985	0.568	5.339		
5 Sep 1985	0.057	0.536		
10 Oct 1985	0.360	3.384		
15 Oct 1985	0.185	1.739		
11 Nov 1985	0.121	1.137		
20 Nov 1985			0.270	2.538
30 Apr 1986	0.139	1.307	0.216	2.030
7 May 1986	0.262	2.463	0.036	0.338
16 May 1986	0.297	2.792		
19 May 1986	0.935	8.789		
30 May 1986	0.630	5.922		
19 Jun 1986	0.052	0.489		
4 Jul 1986	0.463	4.352		
10 Jul 1986	0.062	0.523		
26 Jul 1986	0.152	1.428		
4 Aug 1986	0.270	2.538		
15 Aug 1986	0.270	2.538		
21 Aug 1986	0.125	1.175		
5 Sep 1986	0.267	2.510		

Table 5. Continued.

DATE	Northern zone		Southern zone	
	ESD	EPD	ESD	EPD
23 Sep 1986	0.111	1.043		
23 Oct 1986	0.069	0.649		
24 Oct 1986			0.221	2.077
20 Nov 1986			0.196	1.842
23 Nov 1986	0.122	1.147		
6 Dec 1986			0.074	0.696
16 Sep 1987	0.207	1.946		
3 Dec 1987	0.000	0.000		
7 Jun 1988	0.286	2.688		
14 Jul 1988	0.125	1.175		
15 Jul 1988	0.443	4.164		
29 Jul 1988	0.482	4.531		
11 Aug 1988	0.151	1.419		
27 Oct 1988	0.173	1.626		
25 Jul 1989	0.033	0.310	0.036	0.338

Figure 6. Density of surfaced loggerhead turtles observed in each of the two zones (Figure 1) surveyed in 1985. Either the northern or southern zone was surveyed on a given date.

Aerial Surveys

1985

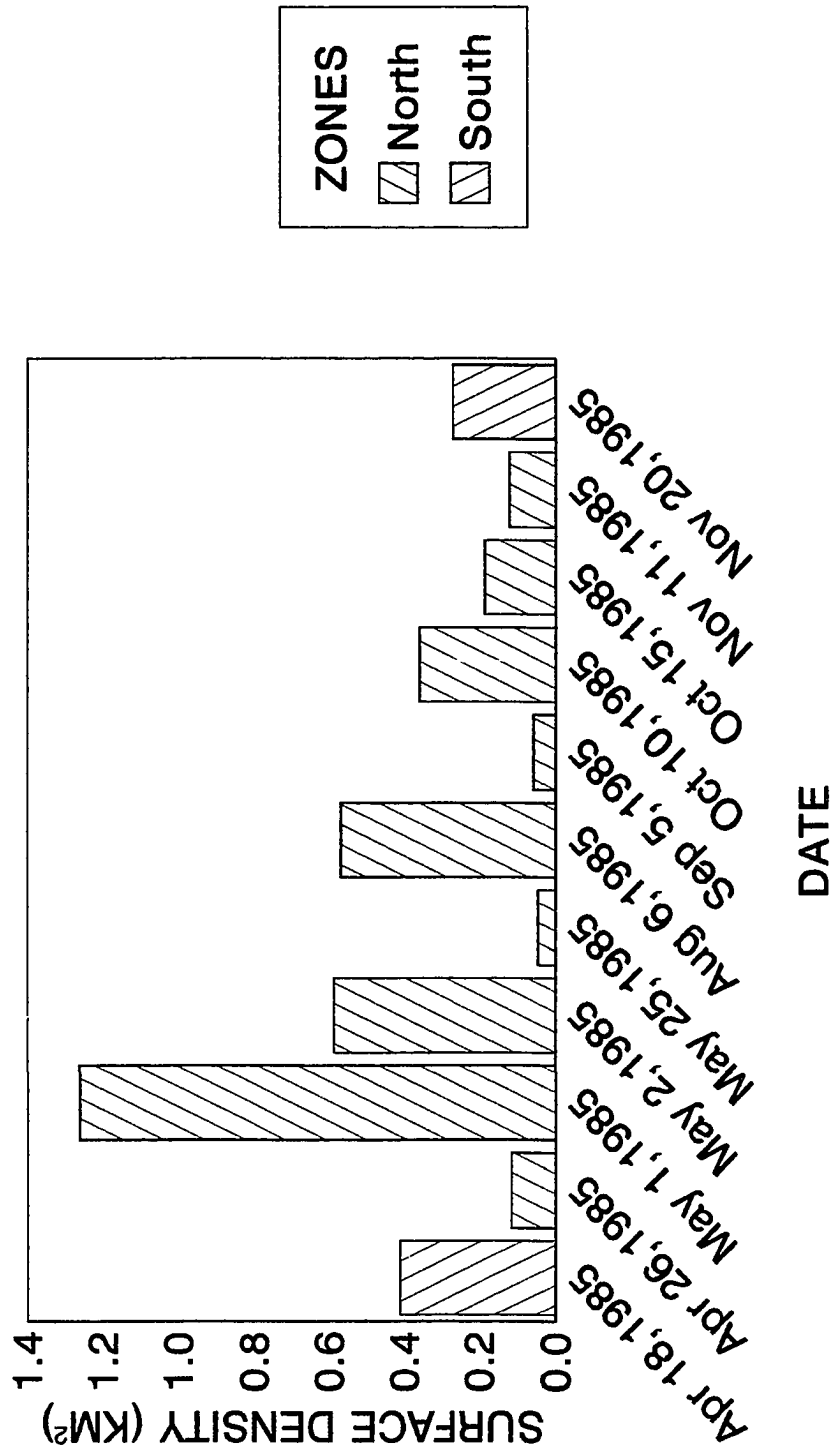


Figure 7. Density of surfaced loggerhead turtles observed in each of the two zones (Figure 1) surveyed in 1986. Both the northern and southern zones were surveyed on 30 April 1986 and 7 May 1986, only one zone was surveyed on the other dates.

Aerial Surveys

1986

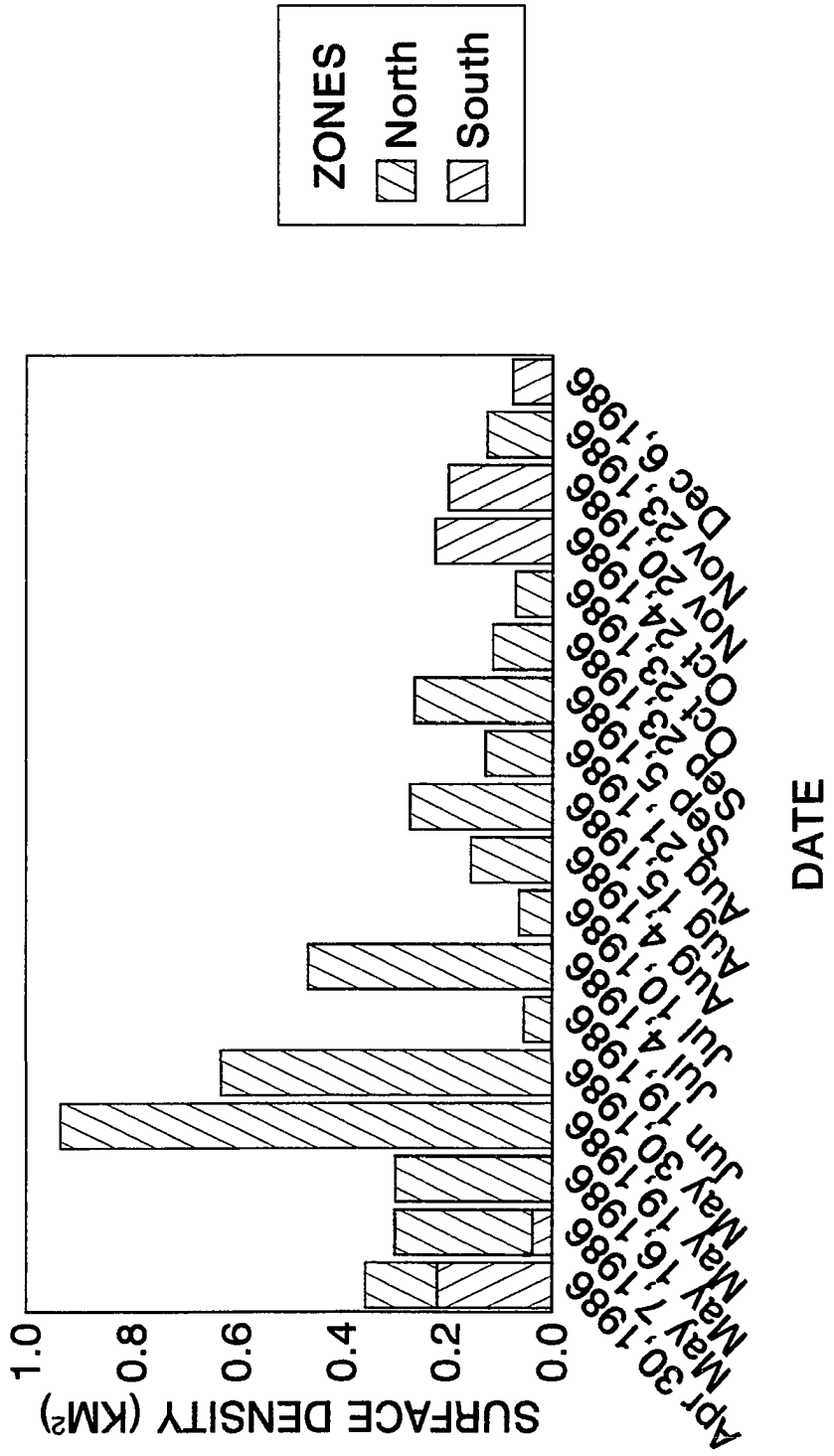


Figure 8. Density of surfaced loggerhead turtles observed in each of the two zones (Figure 1) surveyed in 1987 - 1989. Both the northern and southern zones were surveyed on 25 July 1989, only one zone was surveyed on the other dates.

Aerial Surveys

1987 - 1989

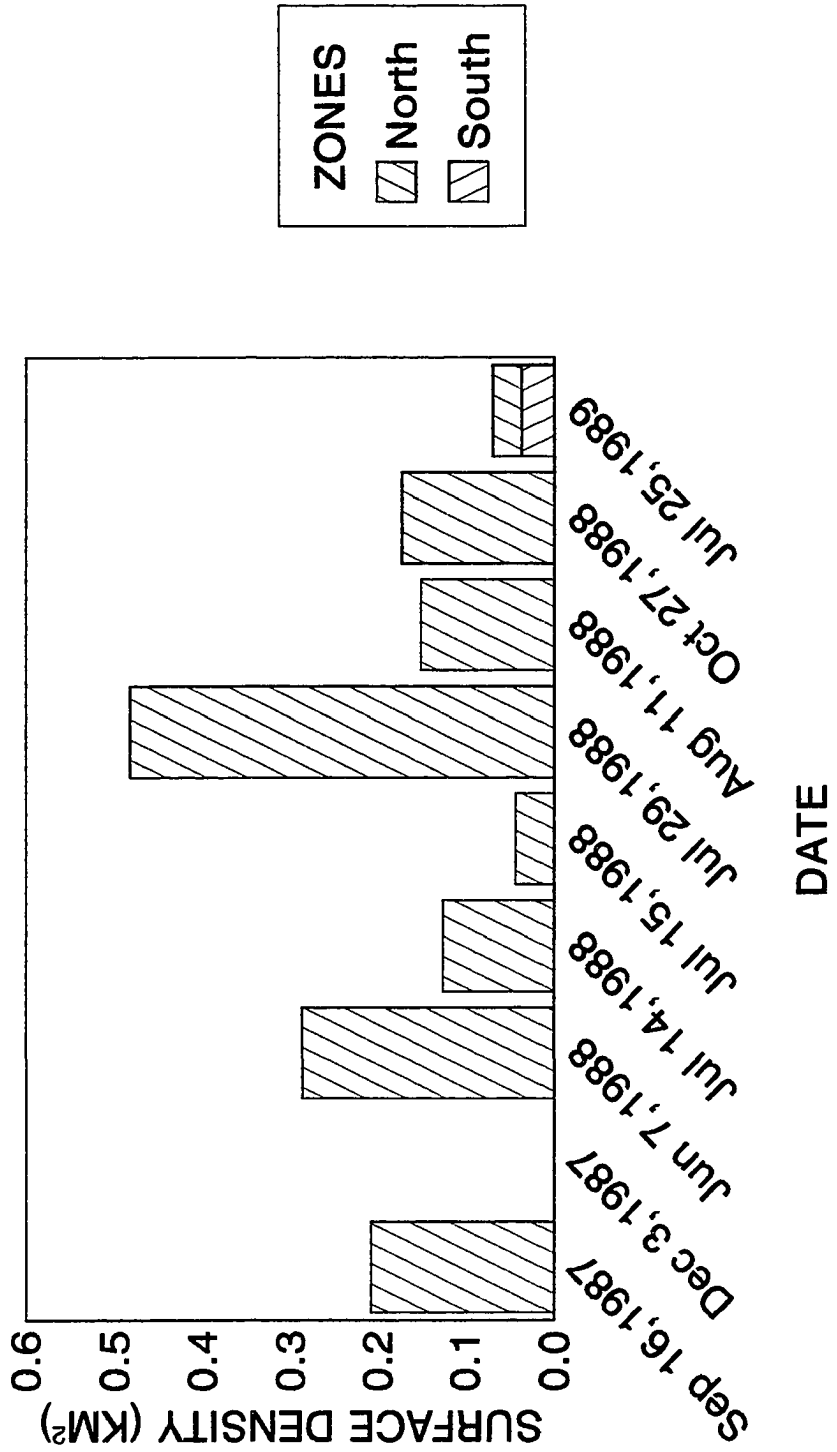


Table 6. Estimated density of loggerhead turtles in the three zones surveyed during 1991 and 1992 (Figure 2), in turtles km⁻². ESD = estimated surface density; EPD = estimated population density. SS = estimated standing stock of turtles in each zone. SD = standard deviation, NS = not surveyed.

DATE	ZONE	ESD		EPD		SS	
		Mean	SD	Mean	SD	Mean	SD
8 May 91	North	.132	.096	1.24	0.90	1893.99	1374.67
	Mid	.024	.037	0.23	0.35	205.14	312.17
	South			<-----NS----->			
30 May 91	North	.108	.109	1.02	1.02	1557.96	1557.96
	Mid	.036	.039	0.34	0.37	303.25	330.01
	South	.060	.054	0.56	0.51	680.96	620.16
6 Aug 91	North	.024	.037	0.23	0.35	351.30	534.59
	Mid	.024	.037	0.23	0.35	205.14	312.17
	South	.000	.000	0.00	0.00	000.00	000.00
13 Sep 91	North	.036	.039	0.34	0.37	519.32	565.14
	Mid	.036	.039	0.34	0.37	303.25	330.01
	South	.024	.059	0.23	0.55	279.68	668.8
15 Nov 91	North	.024	.037	0.23	0.35	351.30	519.32
	Mid	.024	.037	0.23	0.35	205.14	312.17
	South	.156	.106	1.47	1.00	177.52	1216.00
21 Jan 92	North	.000	.000	0.00	0.00	000.00	000.00
	Mid	.012	.029	0.11	0.27	98.11	240.82
	South	.012	.029	0.11	0.27	133.76	328.32
7 Apr 92	North	.000	.000	0.00	0.00	000.00	000.00
	Mid	.204	.106	1.92	1.00	1712.47	891.91
	South	.180	.088	1.02	0.83	1240.32	1009.28
11 Jun 92	North	.036	.039	0.34	0.37	519.32	565.14
	Mid	.000	.000	0.00	0.00	000.00	000.00
	South	.000	.000	0.00	0.00	000.00	000.00
8 Jul 92	North	.264	.301	2.48	2.83	3787.98	4322.57
	Mid	.108	.149	1.02	1.40	909.75	1248.67
	South	.048	.037	0.45	0.35	547.20	425.60
17 Sep 92	North	.036	.088	0.34	0.83	519.32	1267.75
	Mid	.024	.037	0.23	0.35	205.14	312.17
	South	.000	.000	0.00	0.00	000.00	000.00

Figure 9. Density of surfaced loggerhead turtles observed in each of the three zones (Figure 2) surveyed in 1991 - 1992. Only the northern and middle zones were surveyed on 8 May 1991. All three zones were surveyed on other dates.

Aerial Surveys

1991 - 1992

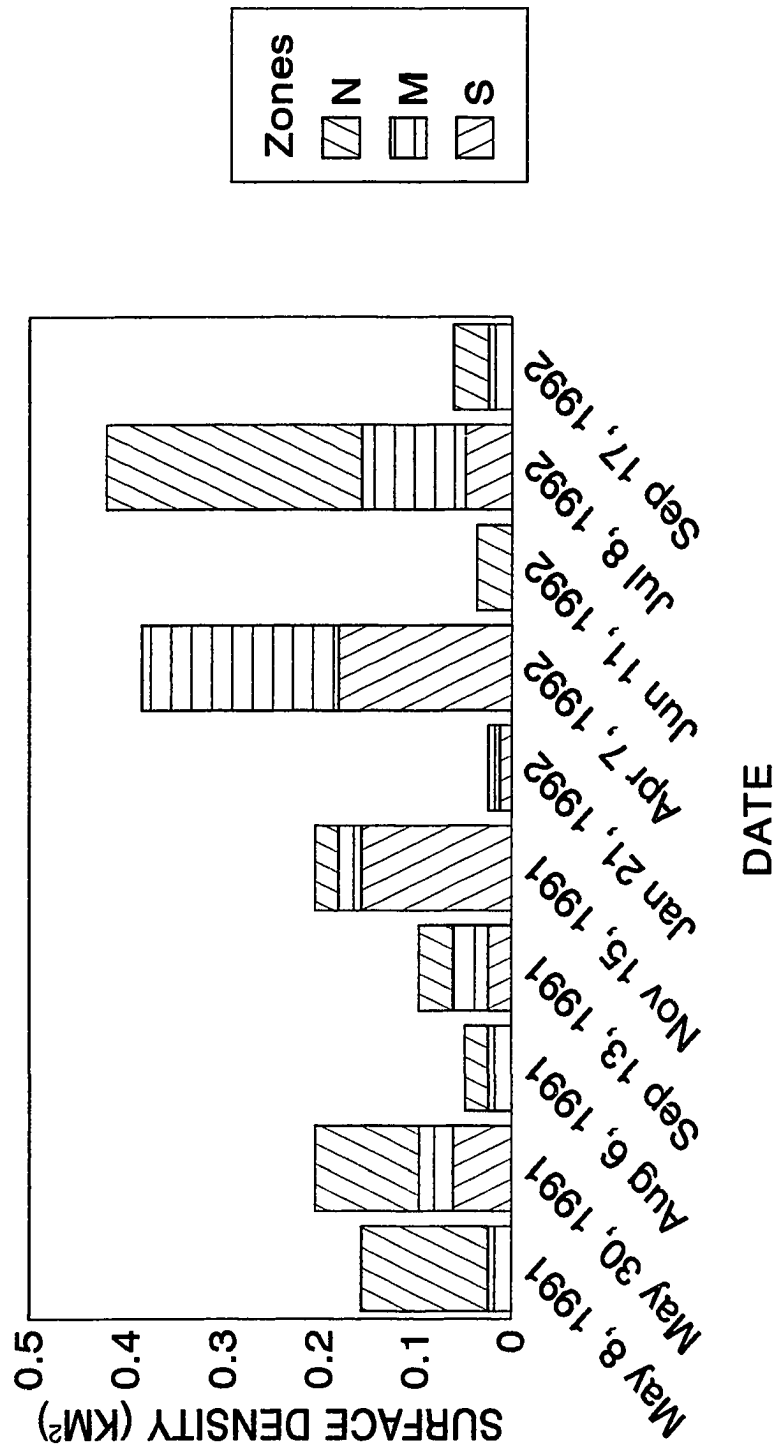
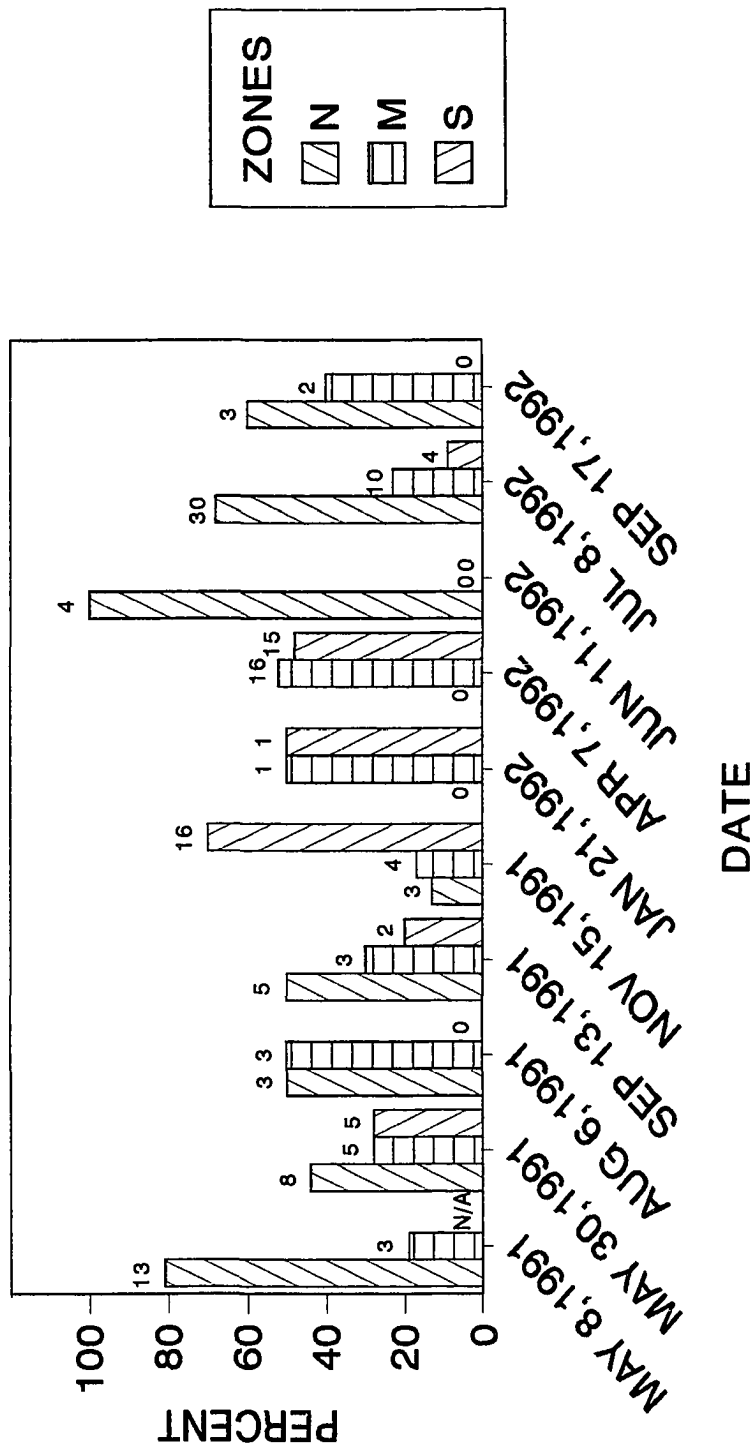


Figure 10. Percentage of loggerhead turtles observed in each of the three zones (Figure 2) surveyed in 1991 - 1992. Number of turtles observed over bars. N/A = not surveyed.

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Aerial Surveys

1991 - 1992



In 1991 and 1992 attempts were made to survey each of the three zones (Table 6, Figures 9 - 10) on each day. On the first survey, the sea state deteriorated and the southern zone was not surveyed. In May 1991 most turtles were observed in the northern zone, then turtles became less abundant but approximately equally distributed throughout the summer. During November 1991 most turtles were observed in the southern zone. No turtles were observed in the northern zone in January 1992, and one turtle was seen in each of the other zones. In April 1992 no turtles were observed in the northern zone, and equal numbers were seen in the middle and southern zones. In June turtles were only observed in the northern zone. In July and September most turtles were seen in the northern zone, followed by the middle and southern zones.

Density estimates of surfaced loggerheads for the 1985 - 1989 surveys ranged from 0 (in December) to 1.261 turtles km^2 (in early May; Table 5, Figures 6 - 8). Diving data from three satellite telemetered loggerheads showed that the turtles migrating south along the North Carolina coast stayed at the surface 10.6% of the time, providing an adjustment factor of 9.4. Applying the adjustment factor yields population density estimates for loggerheads up to 11.853 turtles km^2 . In general, highest densities were observed in the spring (May and June), and lowest in late summer and autumn, while during the summer months, densities fluctuated.

Discounting zero counts, mean density estimates of surfaced loggerheads in the 1991-1992 study ranged from 0.024 to 0.264 turtles km^2 (Table 6). In the northern zone the estimates ranged from 0 (in January and early April) to the maximum of 0.264 turtles km^2 (in early July). Except for the high observed in early July, the greatest densities were observed in May. In the middle zone, observed mean

estimates ranged from 0 (in June) to 0.204 turtles km⁻² (in early April), the survey conducted earliest in the presumed migratory time frame (Table 6). In the southern zone estimates ranged from 0 (in June and August) to 0.180 turtles km⁻² (in early April). Applying the adjustment factor of 9.4 yields population density estimates up to 2.48 turtles km⁻² in the northern zone, 1.92 km⁻² in the middle zone, and 1.47 km⁻² in the southern zone. Standing stocks in the northern zone ranged from 0 to 3787.98 turtles, from 0 to 1712.47 in the middle zone, and from 0 to 1240.32 in the southern zone (Table 6).

Satellite telemetry

The movements and temperatures of eight wild loggerheads, seven head started loggerheads, and three Kemp's ridleys were successfully tracked since 1986 (Table 7). Of these turtles, six wild loggerheads and all the ridleys and head-started loggerheads were instrumented with transmitters capable of measuring diving behavior. Instrumented turtles were released in the autumn either in the Chesapeake Bay or along the coast between Cape Henry, Virginia and Cape Hatteras, North Carolina. Duration of tracks were from 26 d to over 8 mo, when either the transmitters became detached from the turtles or ceased transmitting because of failure or the turtles died.

MOVEMENTS - Kemp's ridleys

Kemp's ridley 01229 was released at Back Bay National Wildlife Refuge (BBNWR), Virginia Beach on 23 October 1991 (Table 7). The turtle traveled south nearshore, and rounded Cape Hatteras the last week of October (Figures 11 - 12, Appendix 2). The turtle continued south, farther offshore, but in water less than 100m deep, and arrived off Cape Lookout early in the first week of November, then started to travel

Table 7. Information on satellite tracked sea turtles. TRX NO = transmitter identification code. Cc = loggerhead sea turtle, Lk = Kemp's ridley sea turtle. DURATION OF TRACK in days; TYPE = transmitter configuration; F = trailing float; B = epoxy backpack.

TRX NO	SPECIES	DATES OF TRACK	DURATION OF TRACK	RELEASE POINT	FINAL DISPOSITION	TYPE

WILD KEMP'S RIDLEYS						
1229	Lk	23 Oct 91- 13 Nov 91	22 d	Va Beach	signal ceased	B
4938	Lk	28 Oct 91- 18 Jan 92	83 d	Va Beach	signal ceased	B
4939	Lk	28 Oct 91- 4 Jan 92	69 d	Va Beach	signal ceased	B

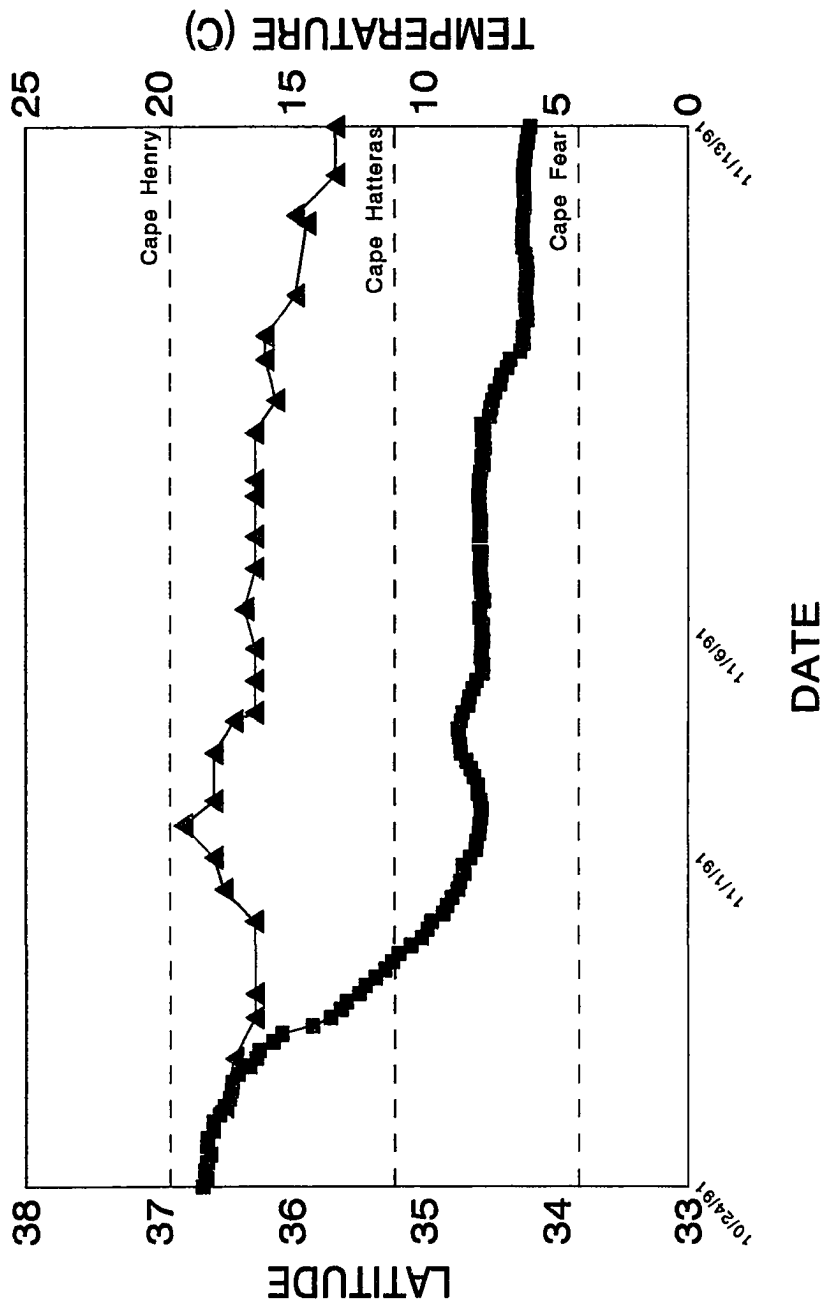
WILD LOGGERHEADS						
5783	Cc	5 Oct 86 - 31 Oct 86	27 d	York River	detached	F
5784	Cc	3 Dec 87 - 31 May 88	181 d	Cape Hatteras	signal ceased	F
4932	Cc	9 Nov 89- 10 Jun 90	214 d	Va Beach	signal ceased	B
4933	Cc	9 Nov 89 - 22 Jun 90	226 d	Va Beach	signal ceased	B
4934	Cc (M)	22 Oct 91- 15 Jun 92	238 d	VIMS Beach	signal ceased	B
4937	Cc (M)	22 Oct 91- 17 Jul 92	271 d	VIMS Beach	signal ceased	B
4935	Cc	28 Oct 91- 24 May 92	210 d	Va Beach	signal ceased	B
1235	Cc (N)	30 Jul 92- 8 Sep 92	41 d	Va Beach	signal ceased	B

HEAD-STARTED LOGGERHEADS						
4931	Cc	4 Oct 89- 5 Jan 90	94 d	Va Beach	signal ceased	B
1228	Cc	18 Sep 91 - 14 Oct 91	27 d	Va Beach	signal ceased	B
1230	Cc	18 Sep 91- 12 Oct 91	25 d	Va Beach	signal ceased	B
1231	Cc	18 Sep 91 - 5 Oct 91	18 d	Va Beach	signal ceased	B
1233	Cc	18 Sep 91- 17 Oct 91	30 d	Va Beach	signal ceased	B
1234	Cc	18 Sep 91 - 25 Sep 91	38 d	Va Beach	signal ceased	B
4936	Cc	23 Oct 91- 11 Dec 91	50 d	Va Beach	signal ceased	B

Figure 11. Positions of Kemp's ridley sea turtle 01229 determined by satellite telemetry. The turtle was released at Back Bay National Wildlife Refuge, Virginia Beach, Virginia on 23 October 1991 and the last location was received on 13 November 1991. Numbered points correspond to "POINT NO" in Appendix 2.

Figure 12. Latitude (squares) and selected temperatures (triangles) as a function of date of Kemp's ridley sea turtle 01229 determined by satellite telemetry.

01229



south later that week (Figures 11 - 12, Appendix 2). The last position was obtained on 13 November, when the turtle was nearshore between Cape Lookout and Cape Fear. The turtle moved at speeds up to 4 km/h, with a mean speed of 1.30 km/h (Table 8, Appendix 2).

Kemp's ridley 04938 was released at BBNWR on 28 October 1991 (Table 7). The turtle traveled south nearshore, and rounded Cape Hatteras the first week of November (Figures 13 - 14, Appendix 3). The turtle continued south and rounded Cape Fear 10 - 12 November, arriving at the South Carolina - Georgia boarder during the end of December, and transmission ceased on 18 January 1992 when the turtle was off the Georgia - Florida boarder (Figures 13 - 14, Appendix 3). The turtle moved at speeds up to 3 km/h, with a mean speed of 1.07 km/h (Table 8, Appendix 3).

Kemp's ridley 04939 was released at BBNWR on 28 October 1991 (Table 7). The turtle traveled south farther offshore than the previous two ridleys, and rounded Cape Hatteras the first week of November (Figures 15 - 16, Appendix 4). The turtle continued south and rounded Cape Fear 17 - 19 November, arriving at the South Carolina - Georgia boarder during the second week of December, and continued to travel south to Cape Canaveral when transmission ceased on 4 January 1992 (Figures 15 - 16, Appendix 4). The turtle moved at speeds up to 6 km/h, with a mean speed of 1.53 km/h (Table 8, Appendix 4).

MOVEMENTS - Wild loggerheads

Loggerhead 05783 was released in the York River on 5 October 1986 (Table 7). The turtle traveled south nearshore and rounded Cape Hatteras between 18 - 31 October and continued south (Figures 17 - 18, Appendix 5). On 31 October the transmitter began transmitting continually, indicating the transmitter was adrift and not attached to

Table 8. Summary statistics on swimming speeds (km/h) of satellite telemetered sea turtles. TAG NUMBER = satellite identification code, SD = standard deviation of the mean, N = sample size, MIN = minimum value, MAX = maximum value.

TAG NUMBER	MEAN	SD	N	MIN	MAX
<u>Kemp's ridleys</u>					
1229	1.30	0.93	132	0	4
4938	1.07	0.73	145	0	3
4939	1.53	1.07	121	0	6
overall	1.28	0.93	398	0	6
<u>Wild loggerheads</u>					
5783	1.38	1.28	4	0	3
5784	1.62	0.96	82	0	5
4932	1.08	1.12	118	0	6
4933	1.44	1.07	148	0	5
4934	1.44	1.22	165	0	6
4937	1.12	1.02	131	0	4
4935	1.63	1.06	141	0	5
1235	2.10	1.26	42	0	6
overall	1.34	1.12	831	0	6
<u>Head-started loggerheads</u>					
4931	1.39	1.04	163	0	6
1228	3.48	2.34	179	0	9
1230	1.25	0.95	156	0	7
1231	1.48	1.30	35	0	5
1233	2.01	2.20	154	0	8
1234	1.64	1.29	30	0	7
4936	2.00	1.42	322	0	8
overall	2.02	1.79	1039	0	9

Figure 13. Positions of Kemp's ridley sea turtle 04938 determined by satellite telemetry. The turtle was released at Back Bay National Wildlife Refuge, Virginia Beach, Virginia on 28 October 1991 and the last location was received on 18 January 1992. Numbered points correspond to "POINT NO" in Appendix 3.

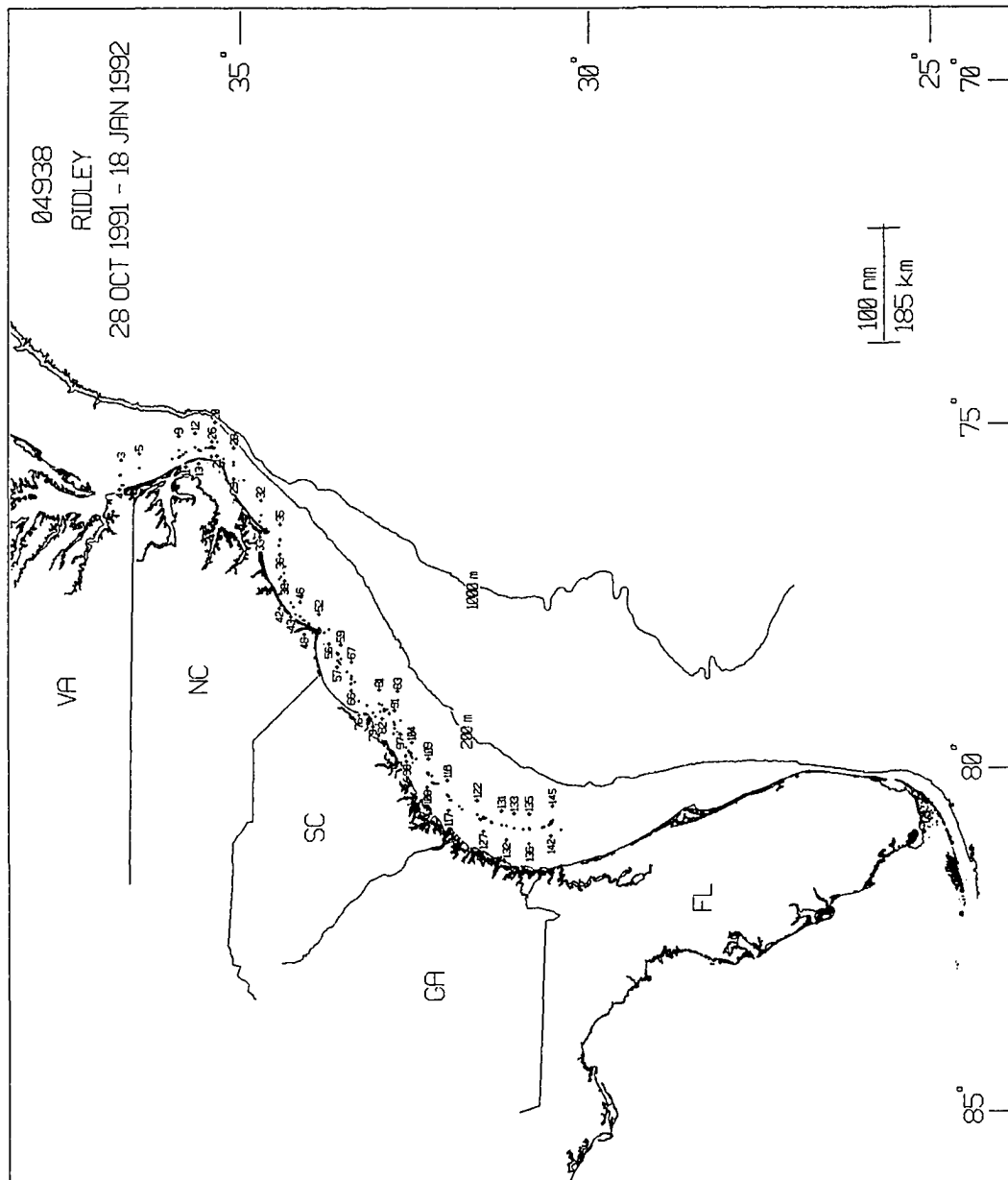


Figure 14. Latitude (squares) and selected temperatures (triangles) as a function of date of Kemp's ridley sea turtle 04938 determined by satellite telemetry.

04938

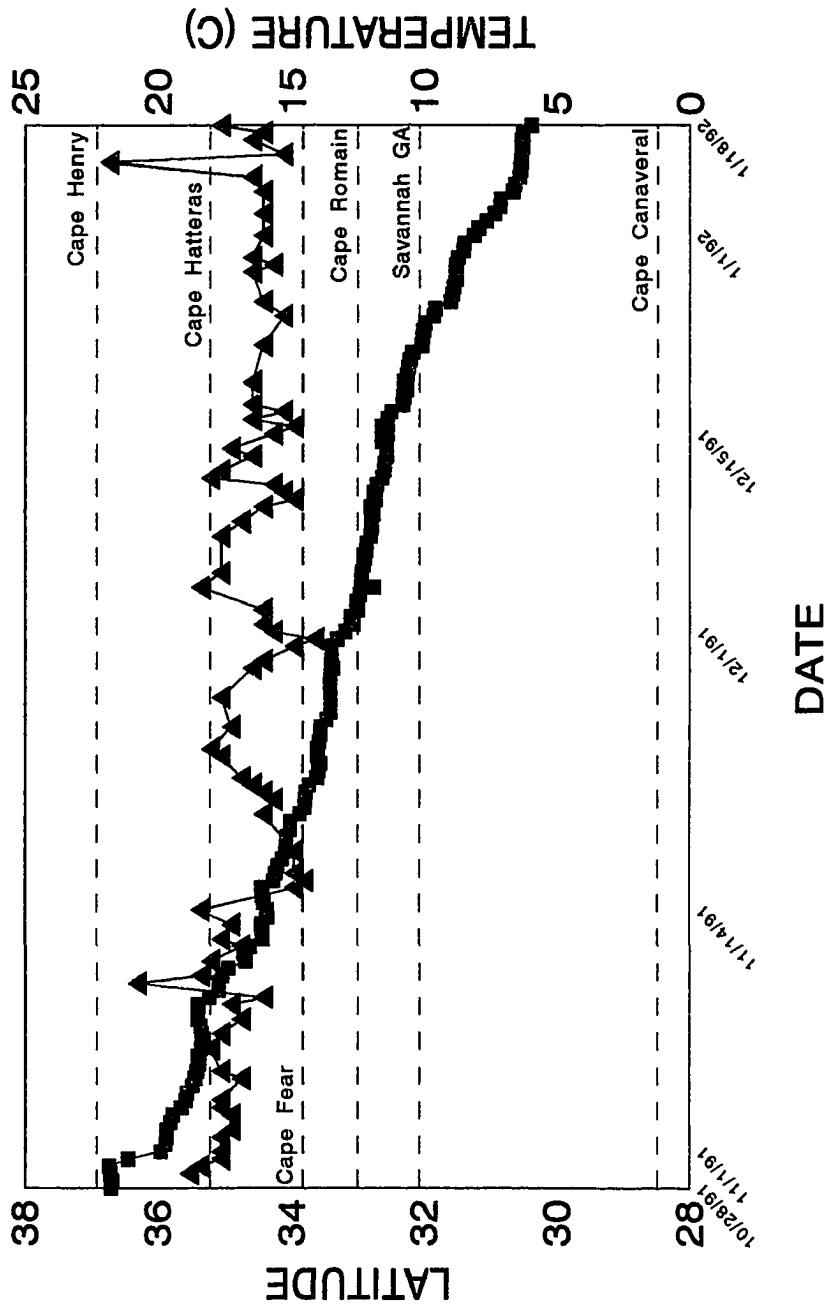


Figure 15. Positions of Kemp's ridley sea turtle 04939 determined by satellite telemetry. The turtle was released at Back Bay National Wildlife Refuge, Virginia Beach, Virginia on 28 October 1991 and the last location was received on 4 January 1992. Numbered points correspond to "POINT NO" in Appendix 4.

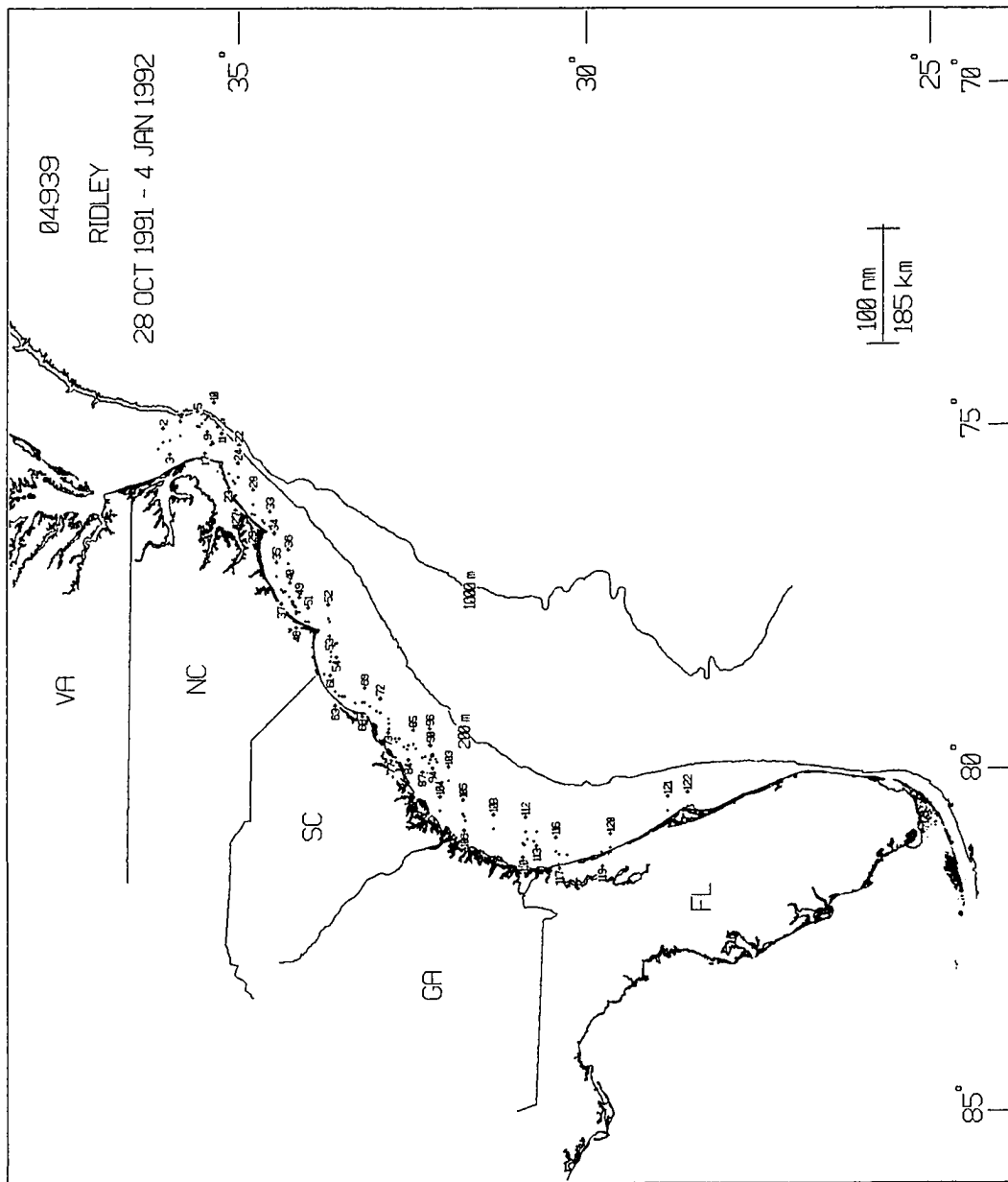
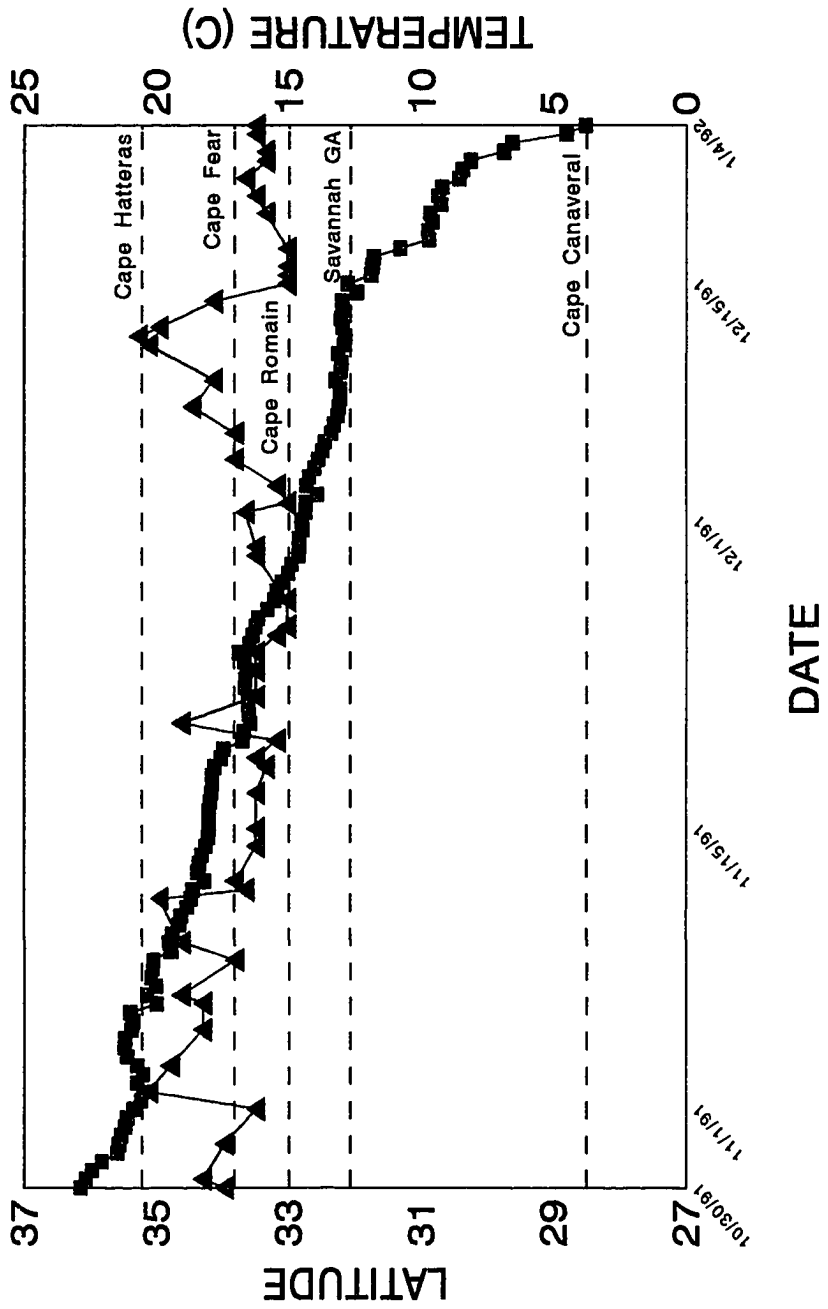


Figure 16. Latitude (squares) and selected temperatures (triangles) as a function of date of Kemp's ridley sea turtle 04939 determined by satellite telemetry.

04939



DATE

Figure 17. Positions of loggerhead sea turtle 05783 determined by satellite telemetry. The turtle was released at the mouth of the York River, Virginia on 5 October 1986 and the transmitter detached from the turtle on 31 October 1986. Numbered points correspond to "POINT NO" in Appendix 5.

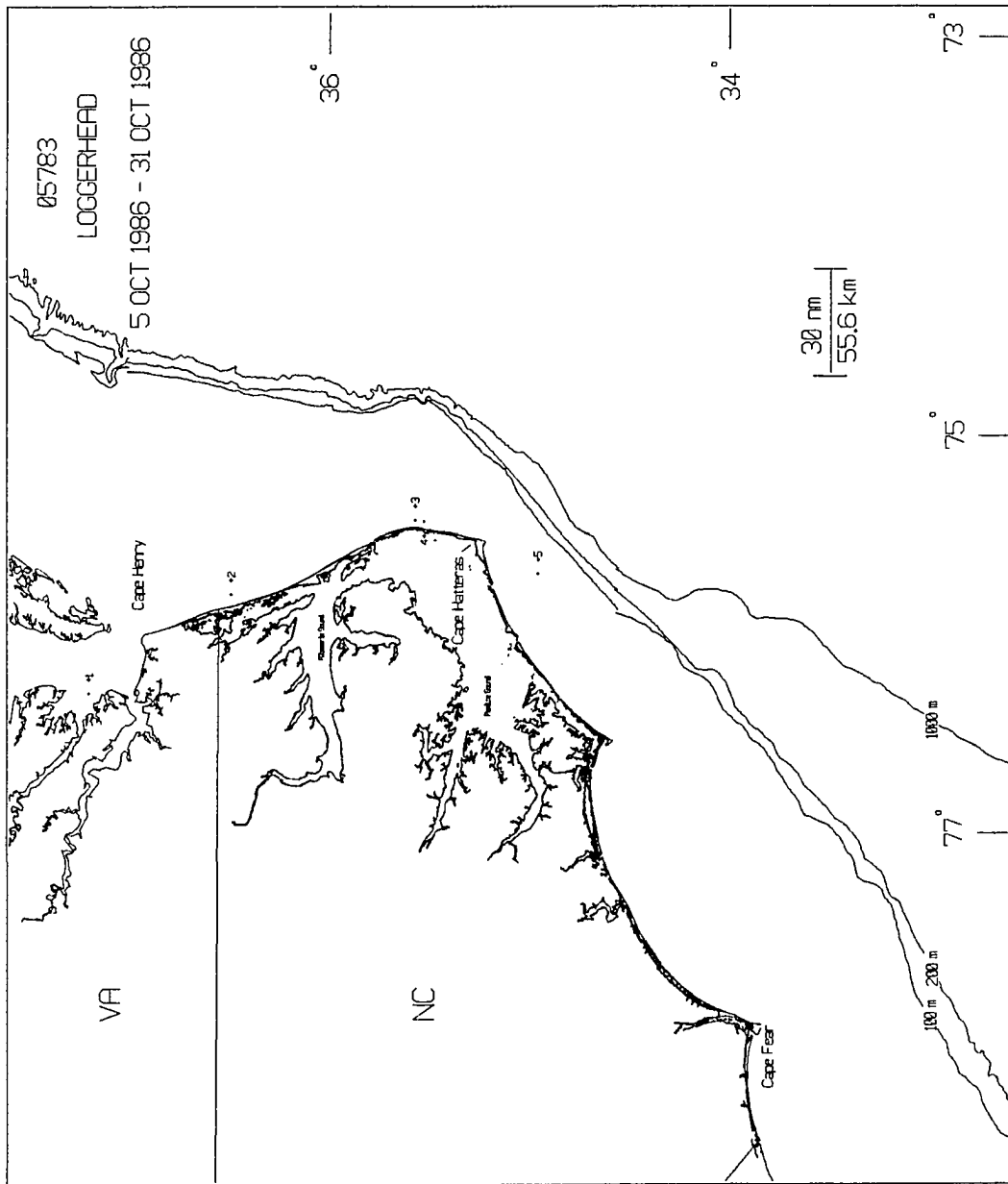
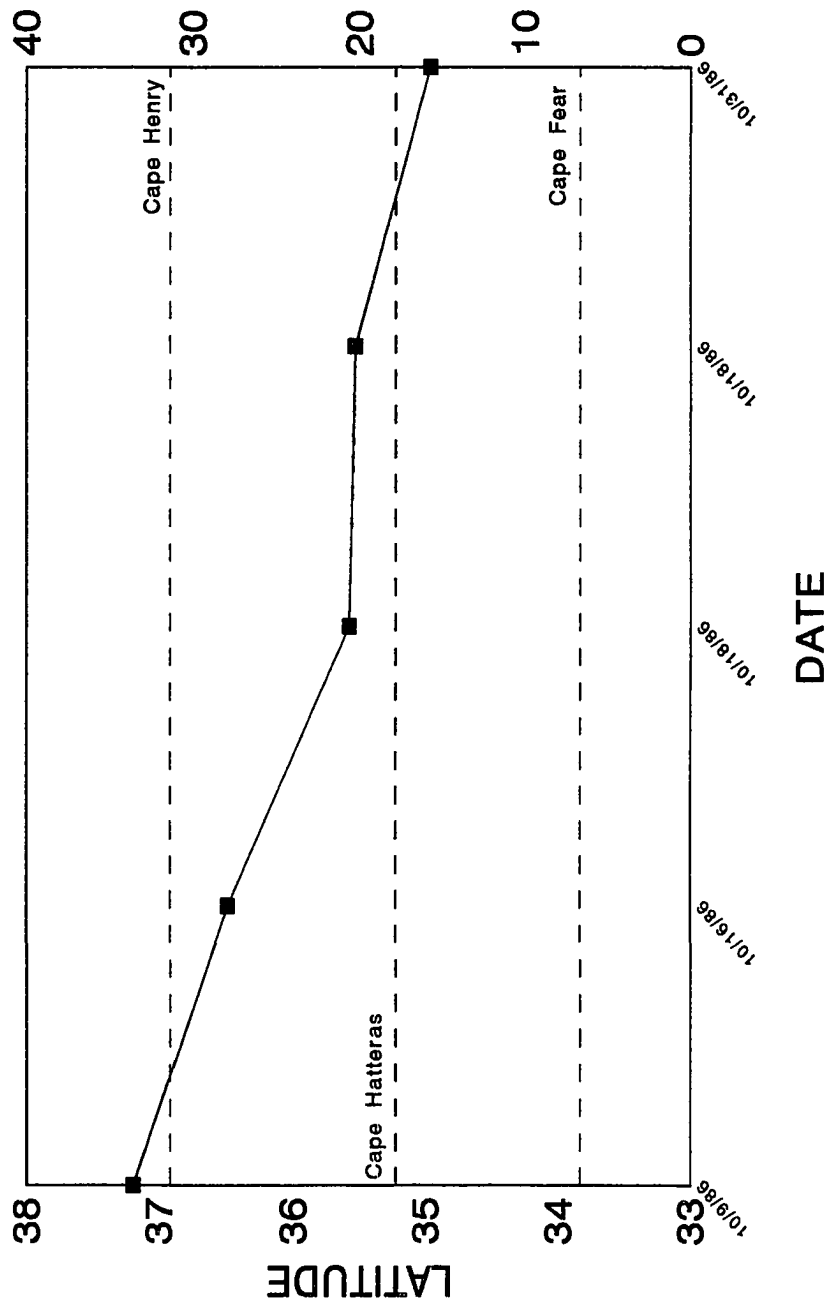


Figure 18. Latitude as a function of date of loggerhead sea turtle 05783 determined by satellite telemetry.

05783



the turtle. Heavy trawling activities were occurring in the area, and it was surmised that the turtle was captured in a trawl and the fisherman detached the transmitter from the turtle and set it adrift. The turtle moved at speeds up to 3 km/h, with a mean speed of 1.38 km/h (Table 8, Appendix 5).

Because of cold temperatures farther north, loggerhead 05784 was released off Oregon Inlet on 3 December 1987 (Table 7). The turtle entered the Gulf Stream and traveled to the north of Bermuda in the Atlantic Ocean (Figures 19 - 20, Appendix 6). The first week of January 1988 the turtle began swimming southwest and again entered the Gulf Stream and traveled north during late April. In early May the turtle began swimming southeast in deep water, and transmissions ceased on 31 May 1988 (Figures 19 - 20, Appendix 6). The turtle moved at speeds up to 5 km/h, with a mean speed of 1.62 km/h (Table 8, Appendix 6).

Loggerheads 04932 and 04933 were released at BBNWR on 9 November 1989 (Table 7). Both turtles traveled south nearshore and rounded Cape Hatteras the last week of November (Figures 21 - 24, Appendices 7 - 8). The turtles continued south nearshore and were off Savannah Georgia by mid-December, and off Cape Canaveral by Mid-January 1990. Loggerhead 04932 continued south to the eastern Florida Keys, where it remained until the transmitter ceased transmitting on 10 June (Figures 21 - 22, Appendix 7). The turtle moved at speeds up to 6 km/h, with a mean speed of 1.08 km/h (Table 8, Appendix 7). Loggerhead 04933 remained off Cape Canaveral until the middle of March when it began travelling north. The turtle passed Cape Fear and Cape Hatteras in early May, and entered the Chesapeake Bay in the second week of May (Figures 23 - 24, Appendix 8). The turtle moved at speeds up to 5 km/h, with a mean speed of 1.44 km/h (Table 8, Appendix 8).

Figure 19. Positions of loggerhead sea turtle 05784 determined by satellite telemetry. The turtle was released off Oregon Inlet, North Carolina on 3 December 1987 and the last location was received on 31 May 1988. Numbered points correspond to "POINT NO" in Appendix 6.

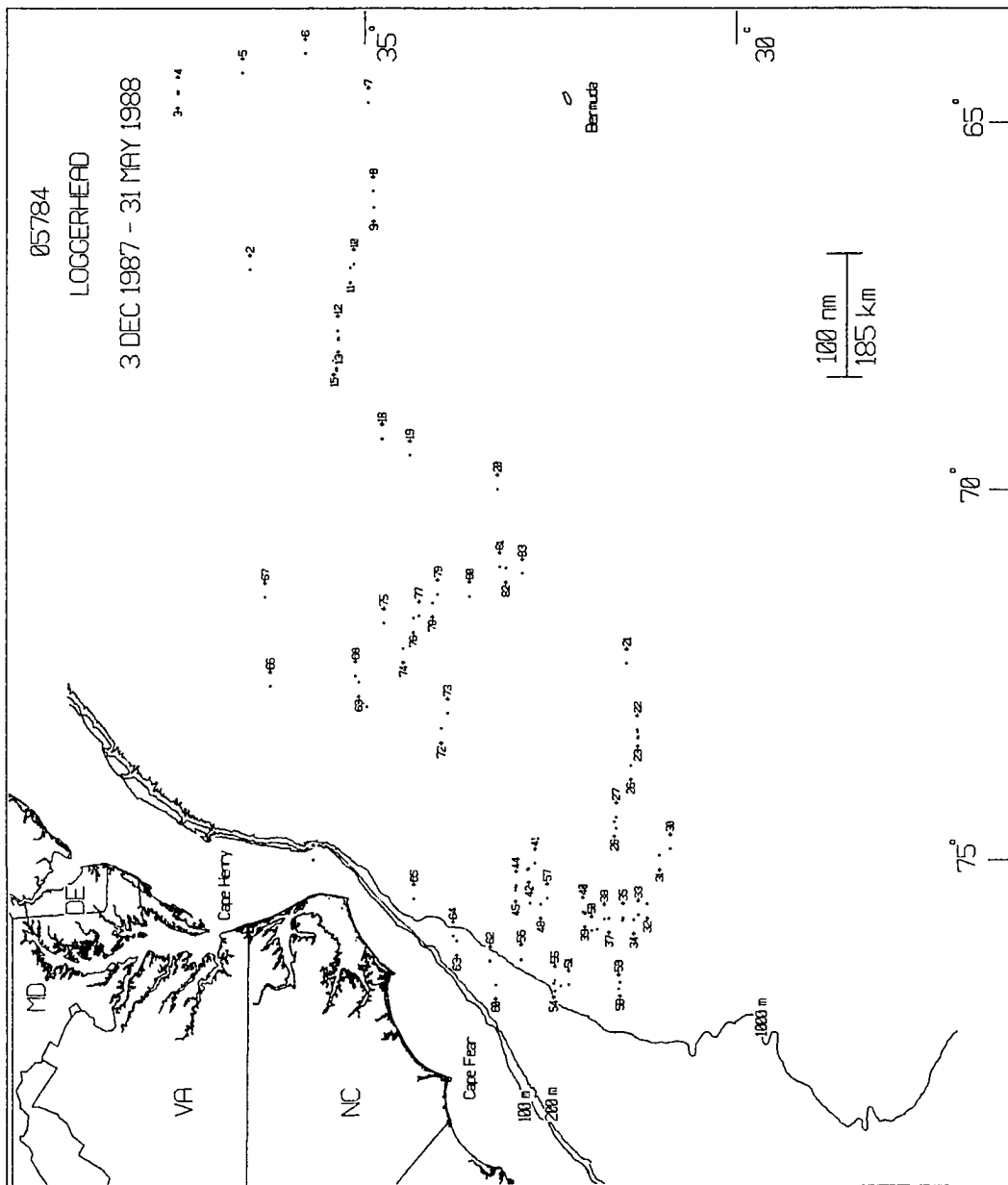


Figure 20. Latitude as a function of date of loggerhead sea turtle 05784 determined by satellite telemetry.

05784

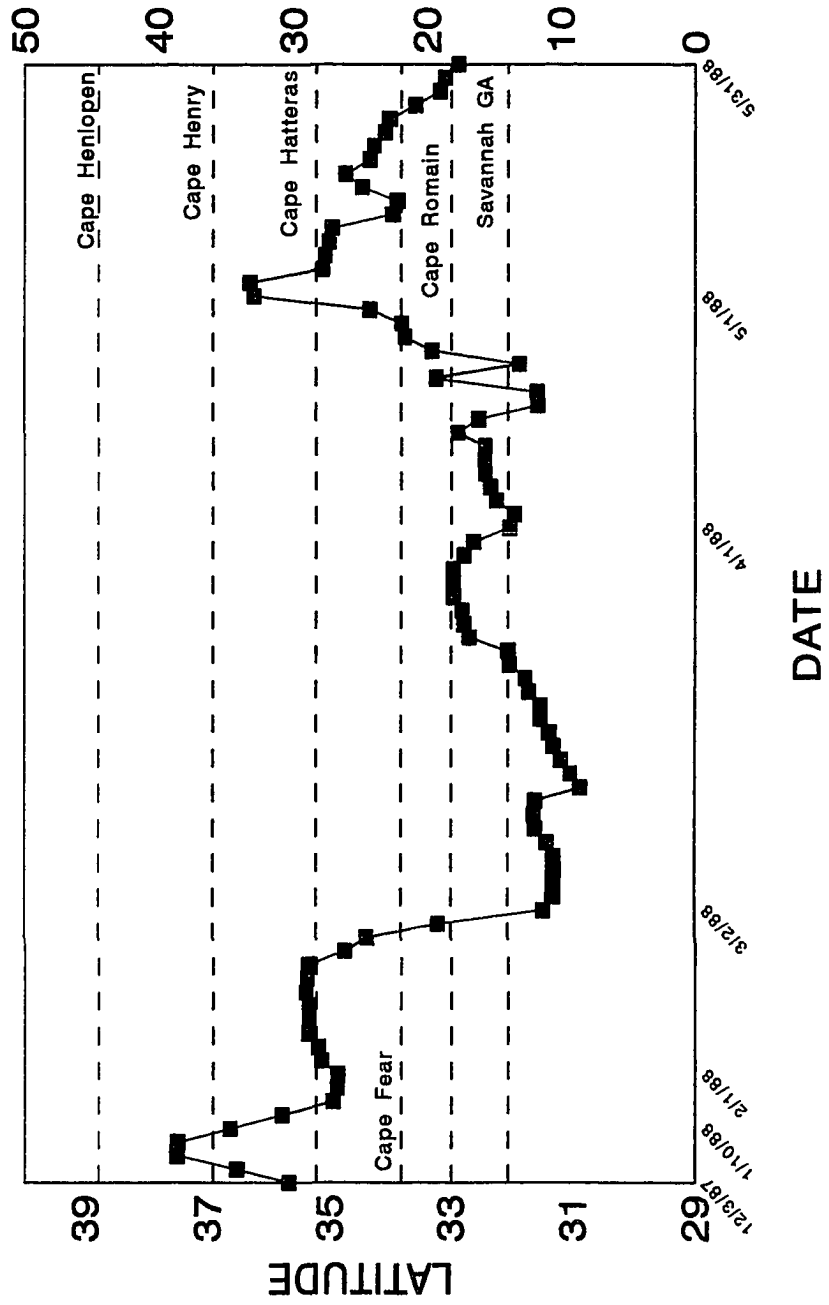


Figure 21. Positions of loggerhead sea turtle 04932 determined by satellite telemetry. The turtle was released at Back Bay National Wildlife Refuge, Virginia Beach, Virginia on 9 November 1989 and the last location was received on 28 May 1990. Numbered points correspond to "POINT NO" in Appendix 7.

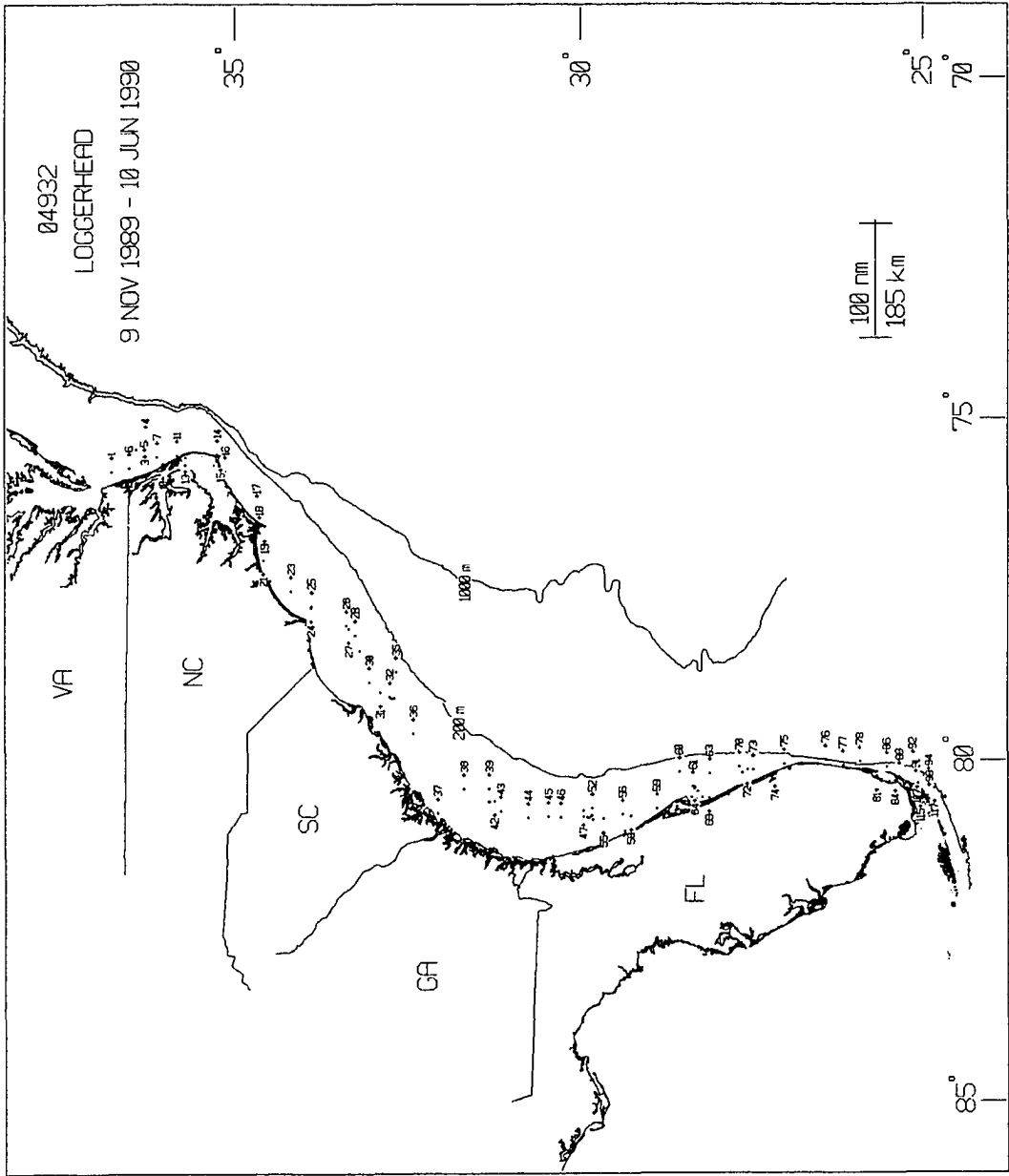


Figure 22. Latitude (squares) and selected temperatures (triangles) as a function of date of loggerhead sea turtle 04932 determined by satellite telemetry.

04932

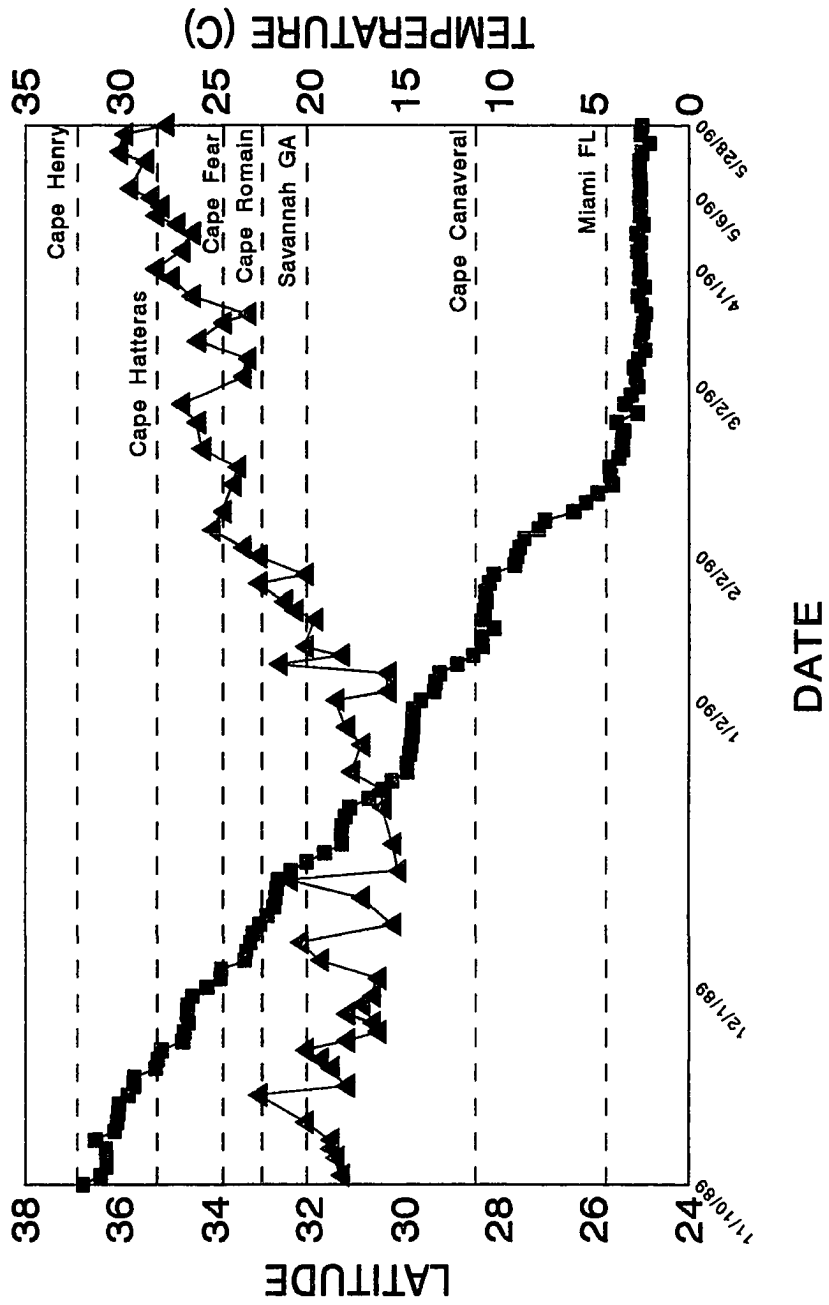


Figure 23. Positions of loggerhead sea turtle 04933 determined by satellite telemetry. The turtle was released at Back Bay National Wildlife Refuge, Virginia Beach, Virginia on 9 November 1989 and the last location was received on 22 June 1990. Numbered points correspond to "POINT NO" in Appendix 8.

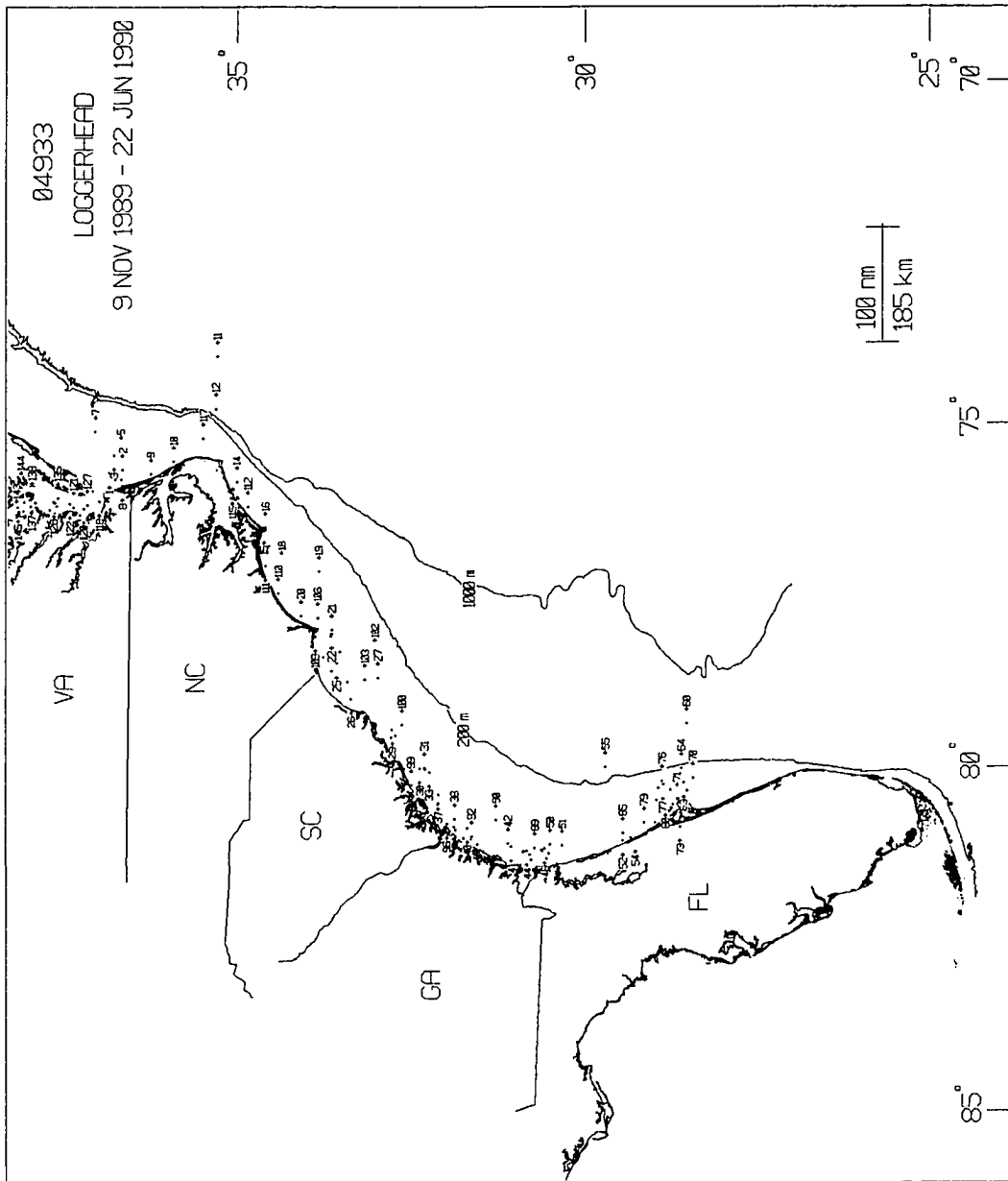
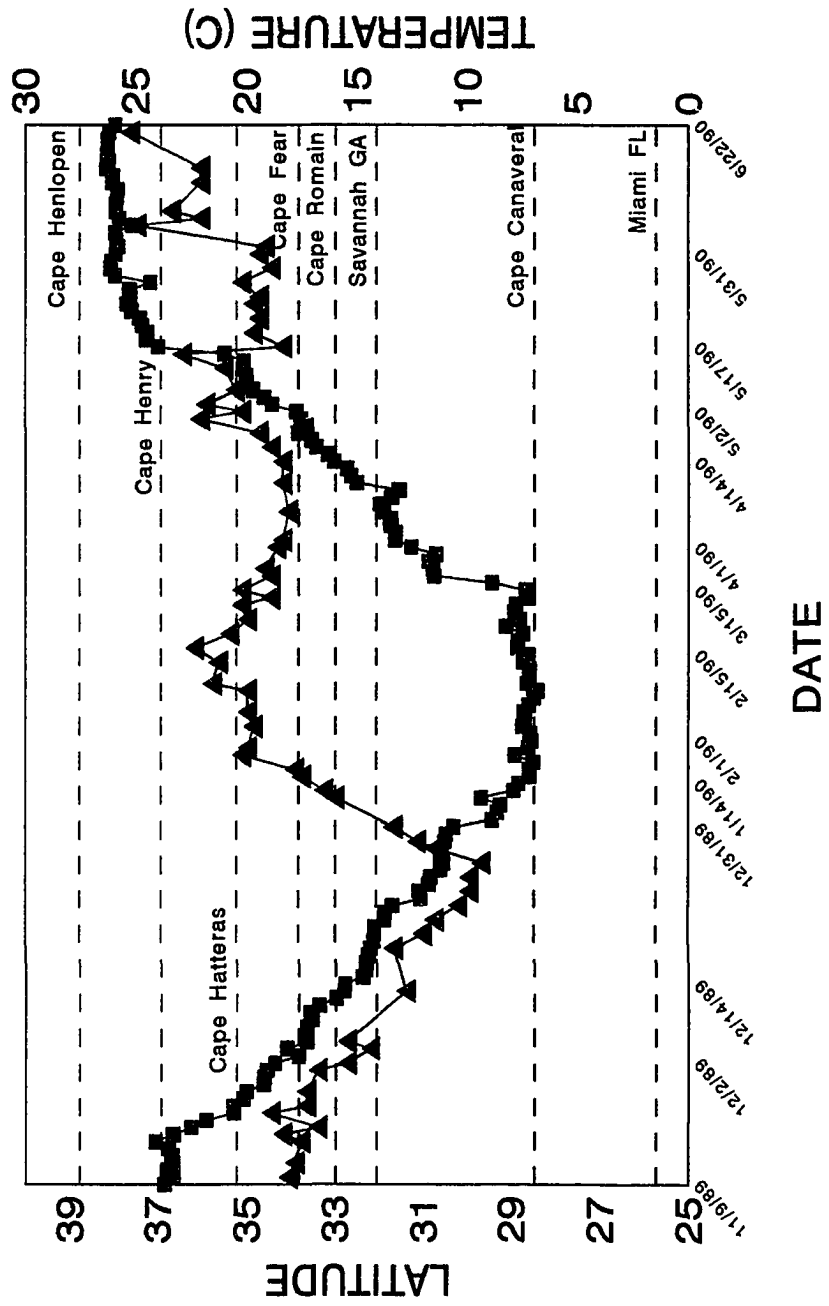


Figure 24. Latitude (squares) and selected temperatures (triangles) as a function of date of loggerhead sea turtle 04933 determined by satellite telemetry. .

049333



Loggerheads 04934 and 04937 were released at VIMS on 22 October 1991 (Table 7), and both had tail and carapace lengths indicating the turtles were either mature or nearly mature males. The turtles traveled south and rounded Cape Hatteras the last week of October (Figures 25 - 28, Appendix 9 - 10). The turtles overwintered over the continental shelf between Cape Fear and Cape Lookout. The turtles began migrating north in mid-April to early May 1992, rounded Cape Hatteras in late May, and entered the Chesapeake Bay in early June (Figures 25 - 28, Appendices 9 - 10). Loggerhead 04934 moved at speeds up to 6 km/h, with a mean speed of 1.44 km/h (Table 8, Appendix 9), while turtle 04937 reached speeds up to 4 km/h with a mean speed of 1.12 km/h (Table 8, Appendix 10).

Loggerhead 04935 was released at BBNWR on 28 October 1991 (Table 7). The turtle traveled south and rounded Cape Hatteras the last week of October (Figures 29 - 30, Appendix 11). The turtle overwintered over the continental shelf just to the south of Cape Hatteras, and entered Pamlico Sound during March 1992. The turtle began migrating north in early May and transmissions ceased on 24 May when the turtle was off Kittyhawk North Carolina (Figures 29 - 30, Appendix 11). The turtle reached speeds up to 5 km/h with a mean speed of 1.63 km/h (Table 8, Appendix 11).

Loggerhead 01235 was telemetered while nesting at BBNWR on 30 July 1992 (Table 7). The turtle immediately traveled south, rounding Cape Hatteras on 9 August, and continued south. The turtle arrived off Florida on 29 August, and remained off northern Florida until 8 September, when transmissions ceased (Figures 31 - 32, Appendix 12). The turtle moved at speeds up to 6 km/h, with a mean speed of 2.10 km/h (Table 8, Appendix 12).

Figure 25. Positions of loggerhead sea turtle 04934 determined by satellite telemetry. The turtle was released at Gloucester Point, Virginia on 22 October 1991 and the last location was received on 15 June 1992. Numbered points correspond to "POINT NO" in Appendix 9.

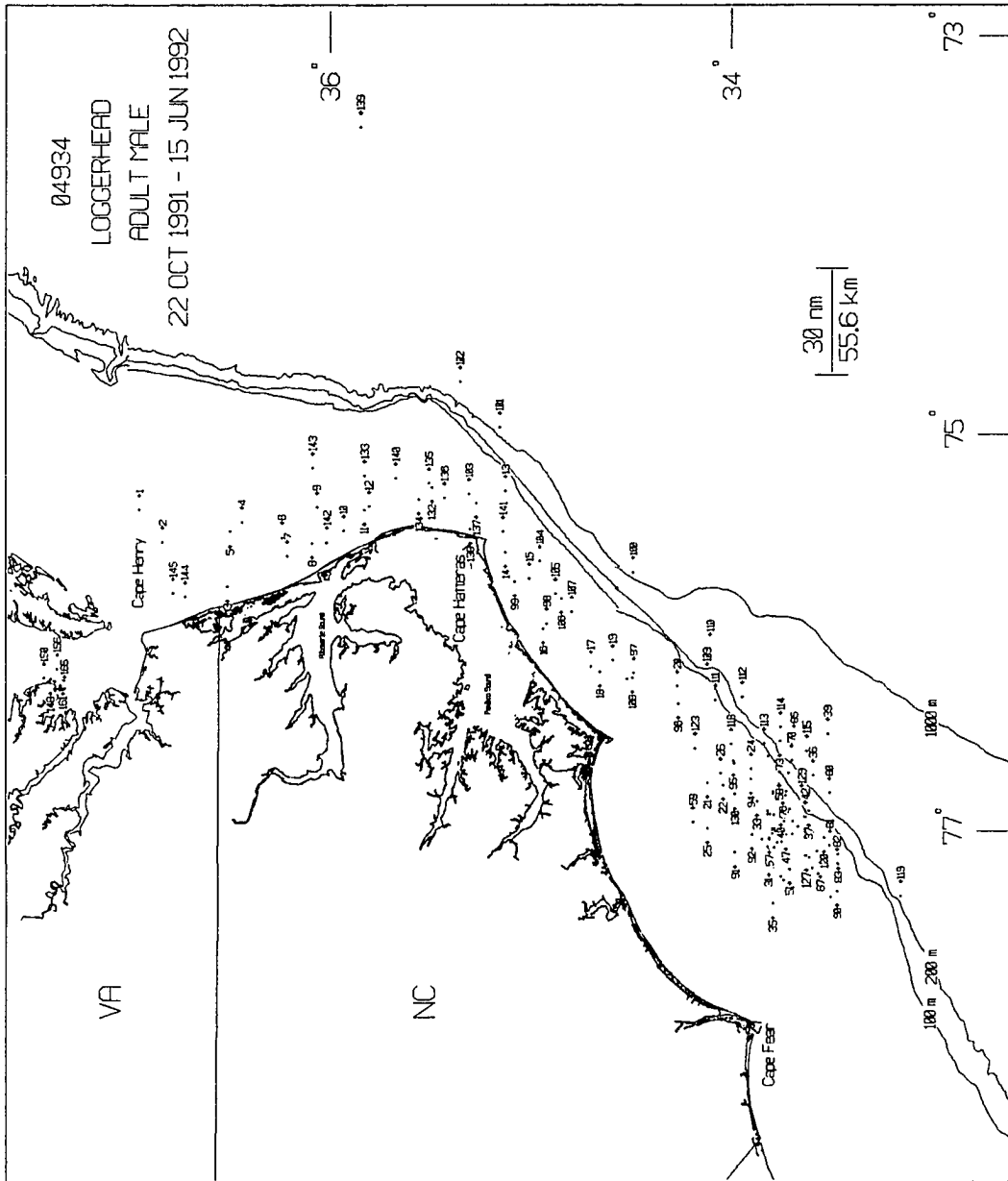


Figure 26. Latitude (squares) and selected temperatures (triangles) as a function of date of loggerhead sea turtle 04934 determined by satellite telemetry.

04934

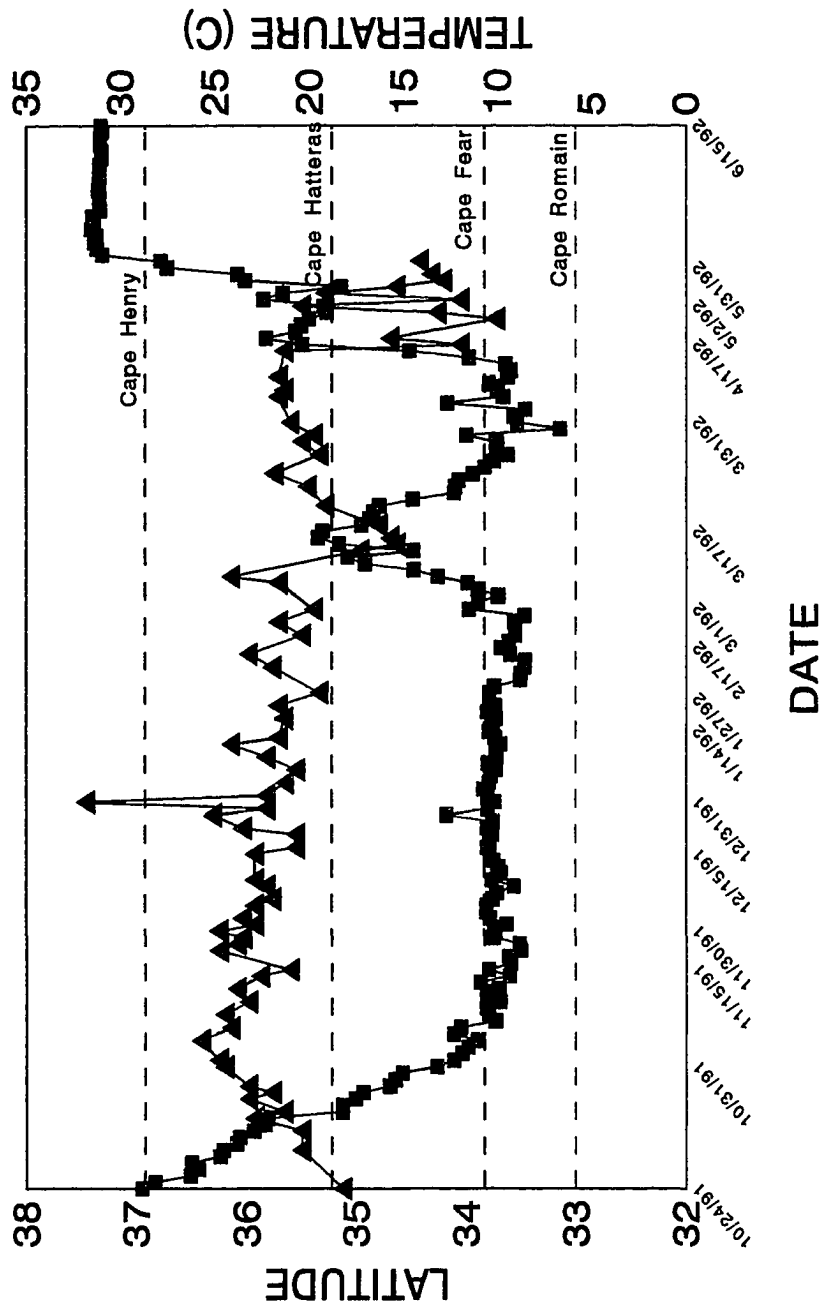


Figure 27. Positions of loggerhead sea turtle 04937 determined by satellite telemetry. The turtle was released at Gloucester Point, Virginia on 22 October 1991 and the last location was received on 17 July 1992. Numbered points correspond to "POINT NO" in Appendix 10.

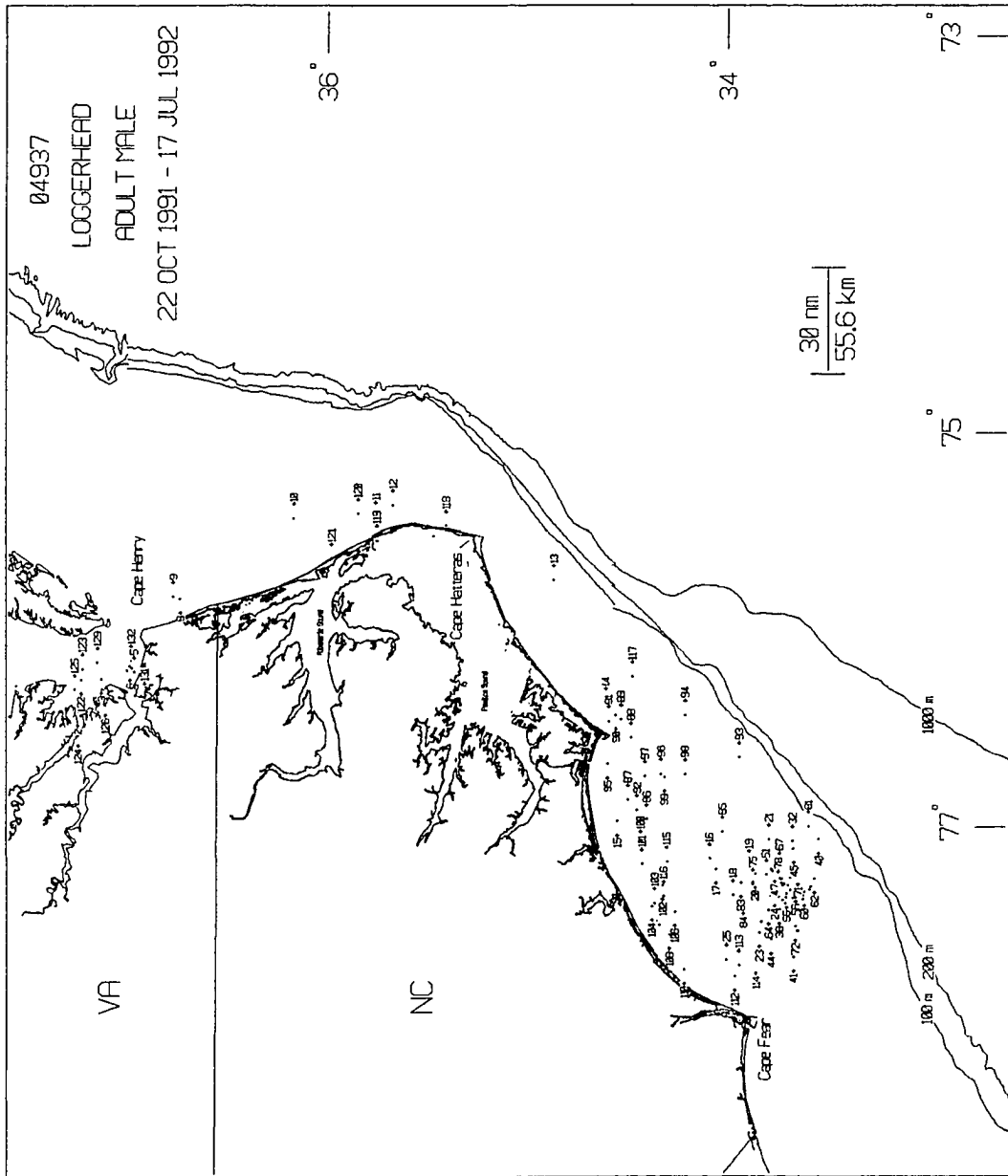


Figure 28. Latitude (squares) and selected temperatures (triangles) as a function of date of loggerhead sea turtle 04937 determined by satellite telemetry.

04937

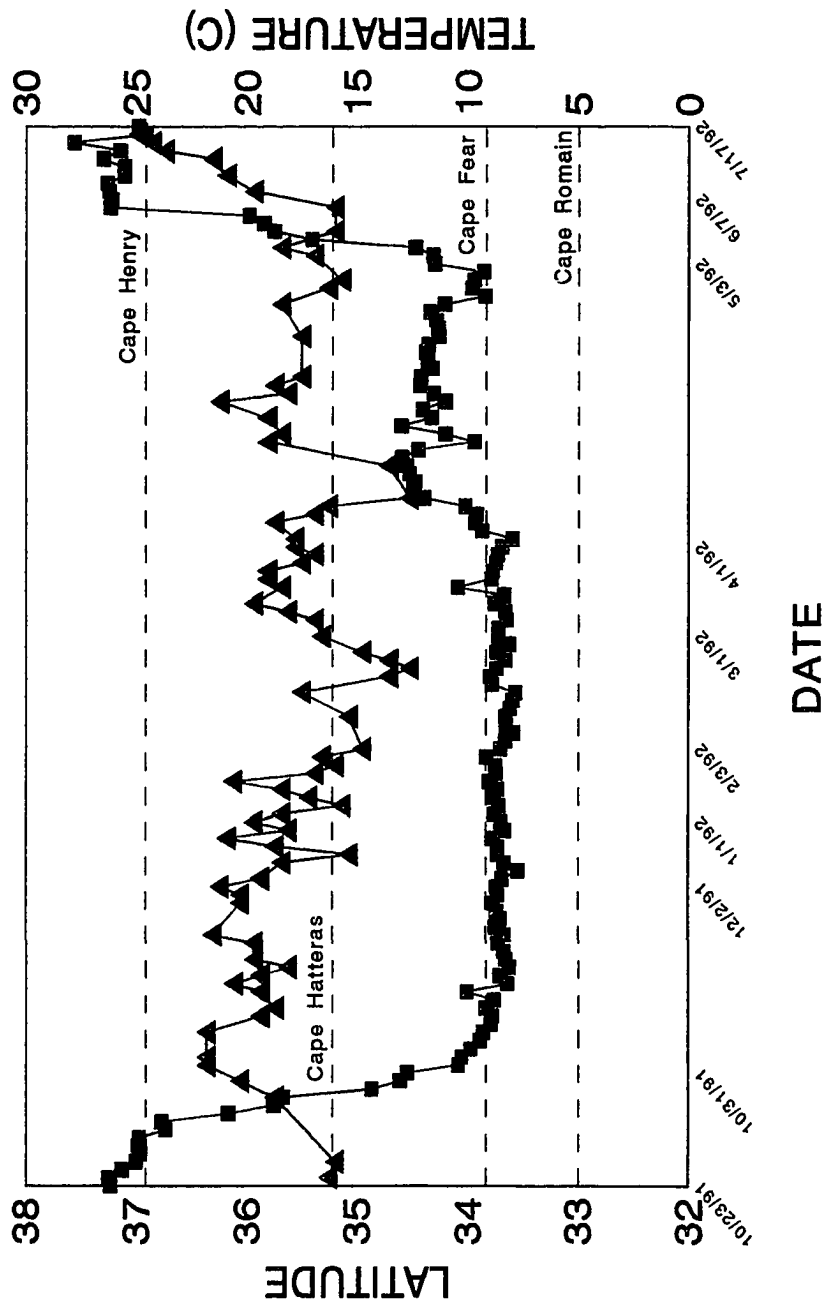


Figure 29. Positions of loggerhead sea turtle 04935 determined by satellite telemetry. The turtle was released at Back Bay National Wildlife Refuge, Virginia Beach, Virginia on 28 October 1991 and the last location was received on 24 May 1992. Numbered points correspond to "POINT NO" in Appendix 11.

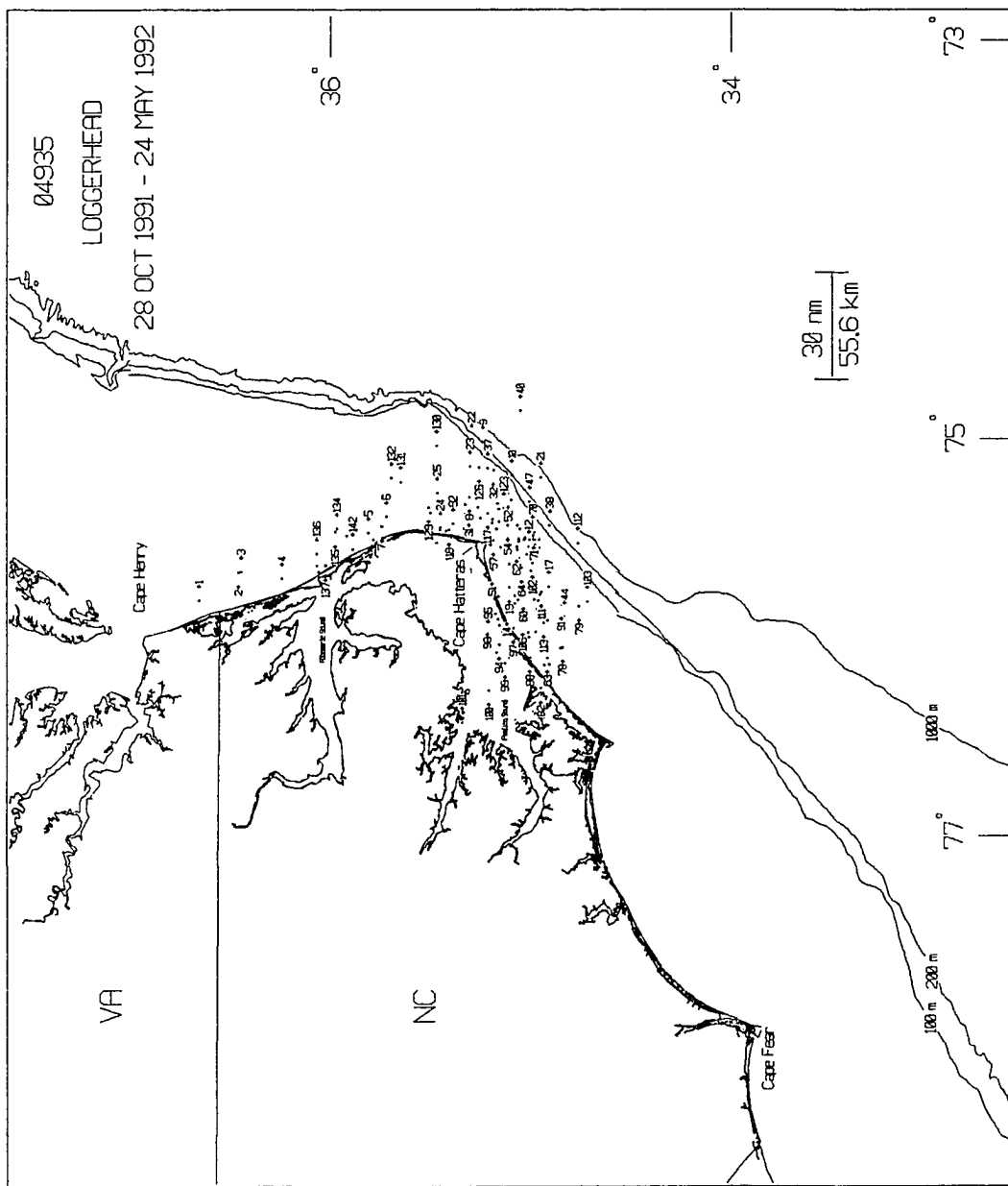


Figure 30. Latitude (squares) and selected temperatures (triangles) as a function of date of loggerhead sea turtle 04935 determined by satellite telemetry.

04935

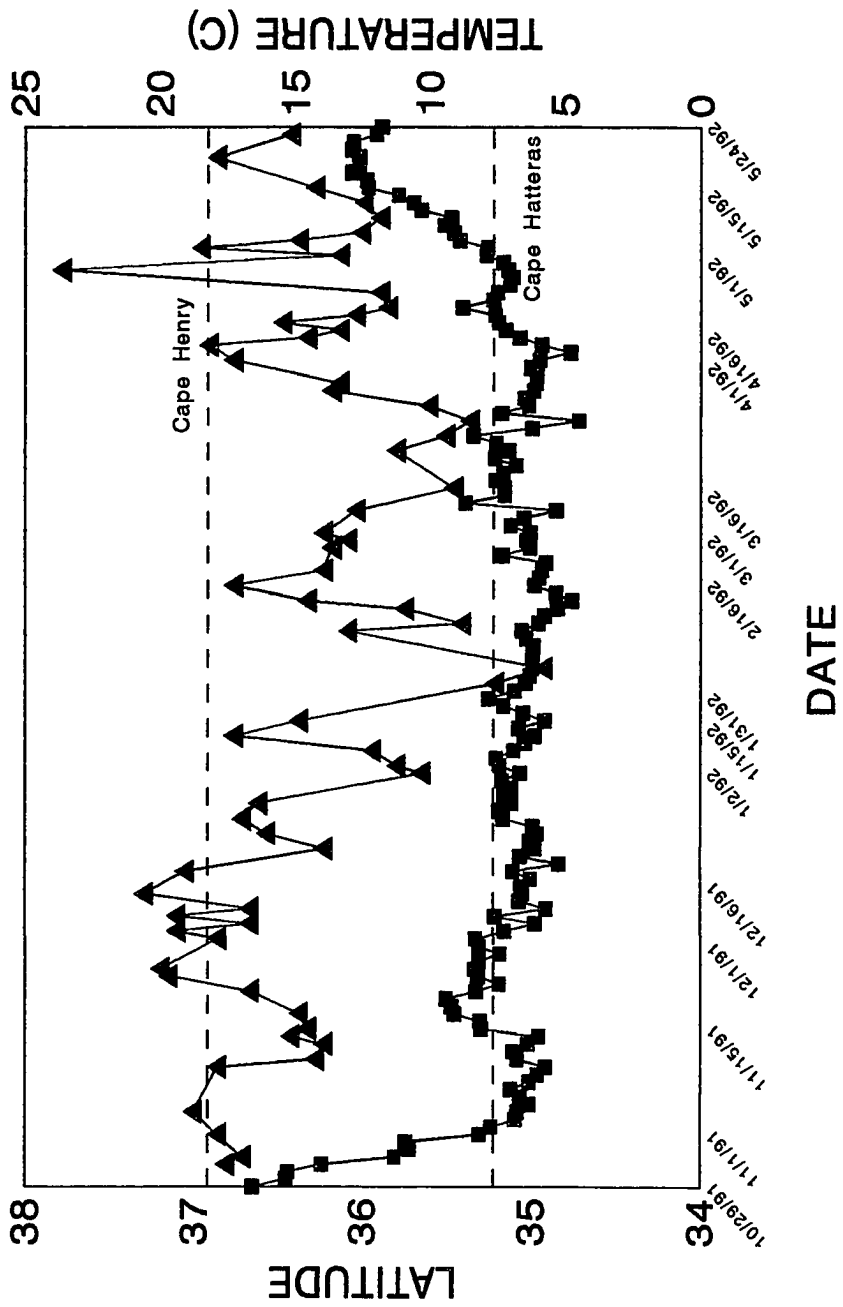


Figure 31. Positions of loggerhead sea turtle 01235 determined by satellite telemetry. The turtle was released at Back Bay National Wildlife Refuge, Virginia Beach, Virginia on 28 October 1991 and the last location was received on 24 May 1992. Numbered points correspond to "POINT NO" in Appendix 12.

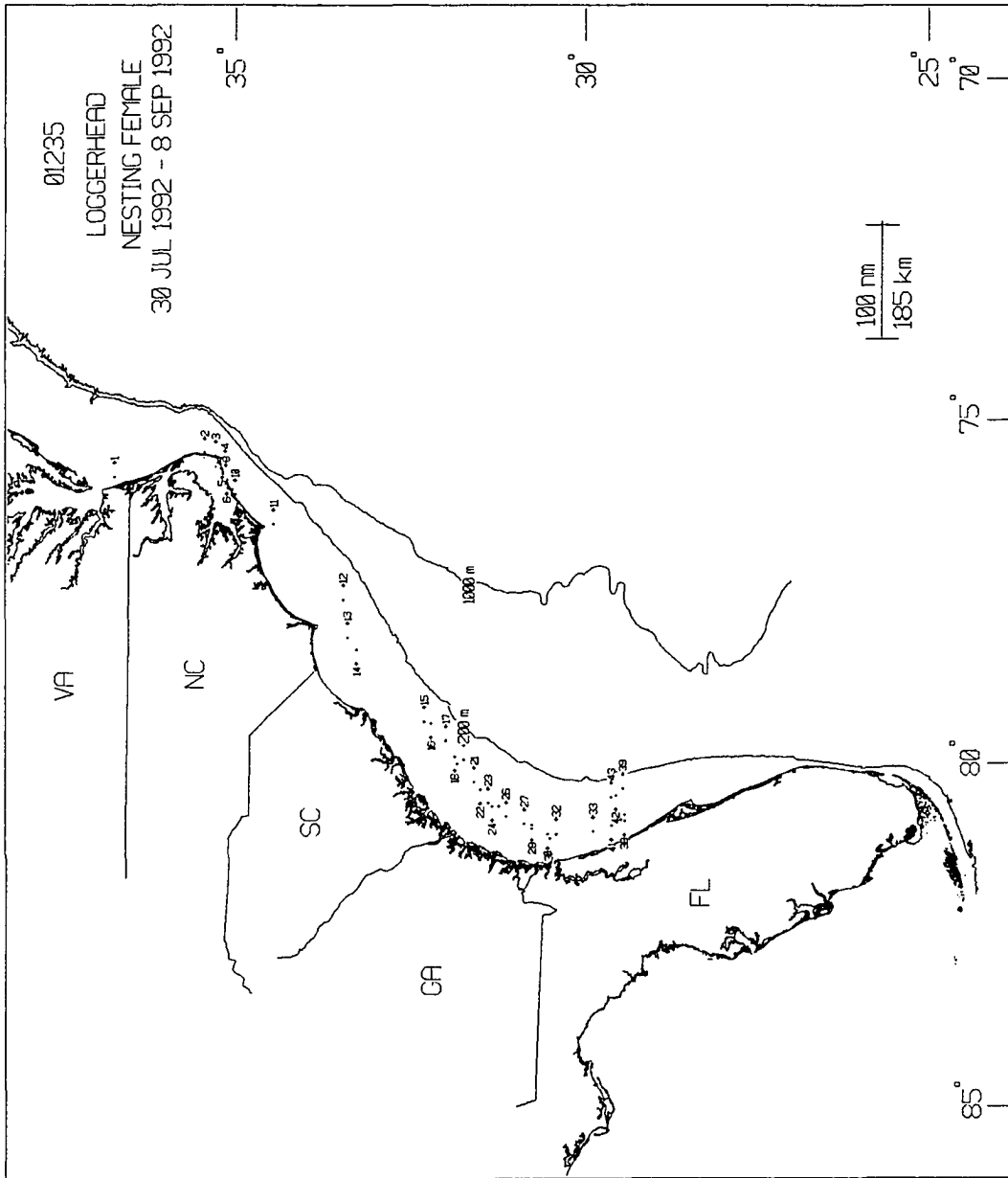
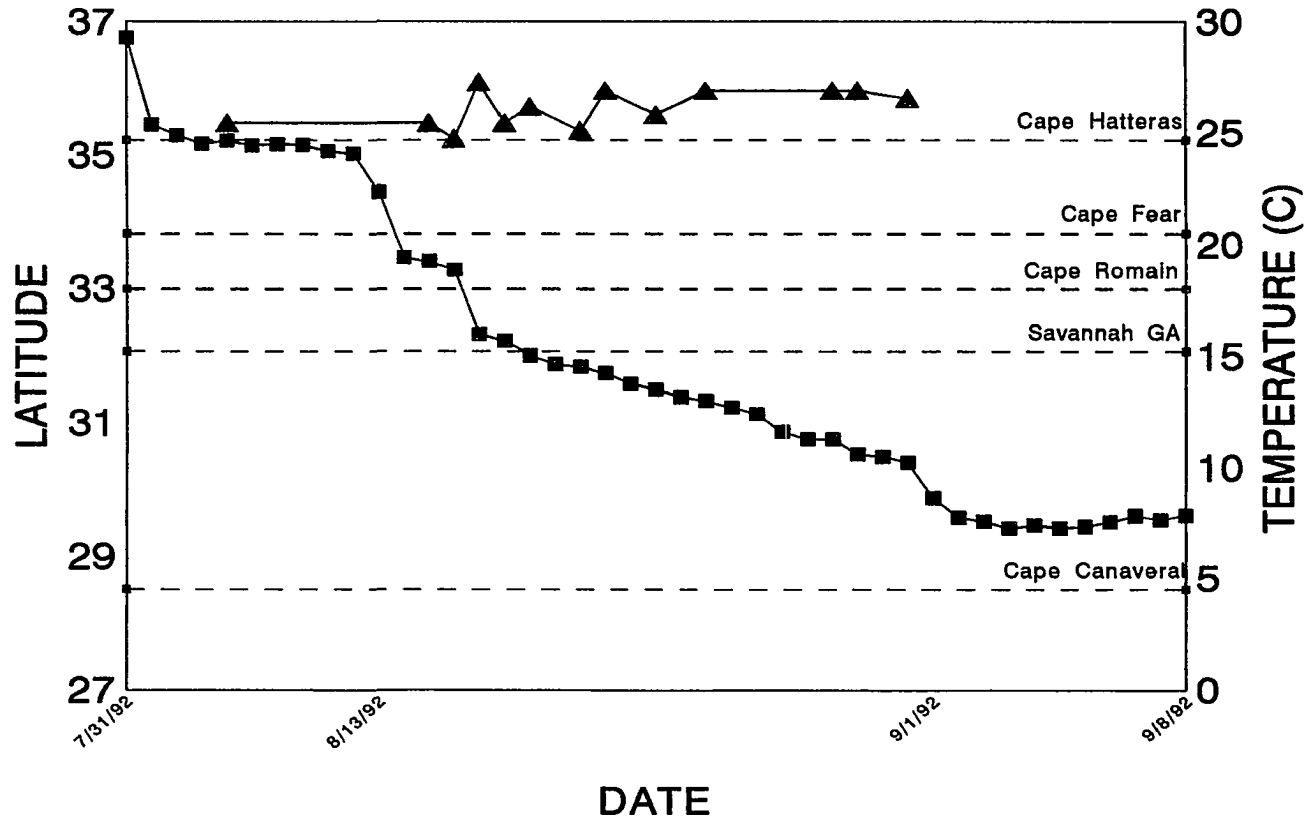


Figure 32. Latitude (squares) and selected temperatures (triangles) as a function of date of loggerhead sea turtle 01235 determined by satellite telemetry.

01235



MOVEMENTS - Head-started loggerheads

Head-started loggerhead 04931 was released at BBNWR on 4 October 1989 (Table 7). The turtle traveled offshore and south, and entered the Gulf Stream on 9 October (Figures 33 - 34, Appendix 13). The turtle traveled north-east in the Gulf Stream until 15 October, when it started heading north-west until the turtle was close to Cape May, New Jersey on 31 October. The turtle then started following the shoreline south, crossing the mouth of Chesapeake Bay on 13 November. The turtle continued south, and rounded Cape Hatteras on 24 November, and Cape Lookout on 10 December. The turtle continued south to off Cape Fear, when the transmitter ceased transmitting on 5 January 1990 (Figures 33 - 34, Appendix 13). The turtle moved at speeds up to 6 km/h, with a mean speed of 1.39 km/h (Table 8, Appendix 13).

Head-started loggerheads 01228, 01230, 01231, 01233, and 01234 were released at BBNWR on 18 September 1991 (Table 7). Turtle 01228 traveled east and entered the Gulf Stream, where it was carried eastward into the North Atlantic. From 29 September to 3 October the turtle was entrained in a cold core ring south of Cape Cod, then it continued east until the transmitter ceased on 14 October (Figure 35, Appendix 14). The turtle moved at speeds up to 9 km/h, with a mean speed of 3.48 km/h (Table 8, Appendix 14).

Head-started loggerhead 01230 traveled north and entered Chesapeake Bay on 19 September. The turtle continued west and entered Back Creek off the York River mouth on 21 September where it remained for 2 days, then the turtle began to swim east, exiting the Bay on 23 September. The turtle then traveled south along the coast to the Virginia - North Carolina boarder until 27 September, when it headed north-east. The signal ceased on 12 October, when the turtle was off

Figure 33. Positions of head-started loggerhead sea turtle 04931 determined by satellite telemetry. The turtle was released at Back Bay National Wildlife Refuge, Virginia Beach, Virginia on 4 October 1989 and the last location was received on 5 January 1990. Numbered points correspond to "POINT NO" in Appendix 13.

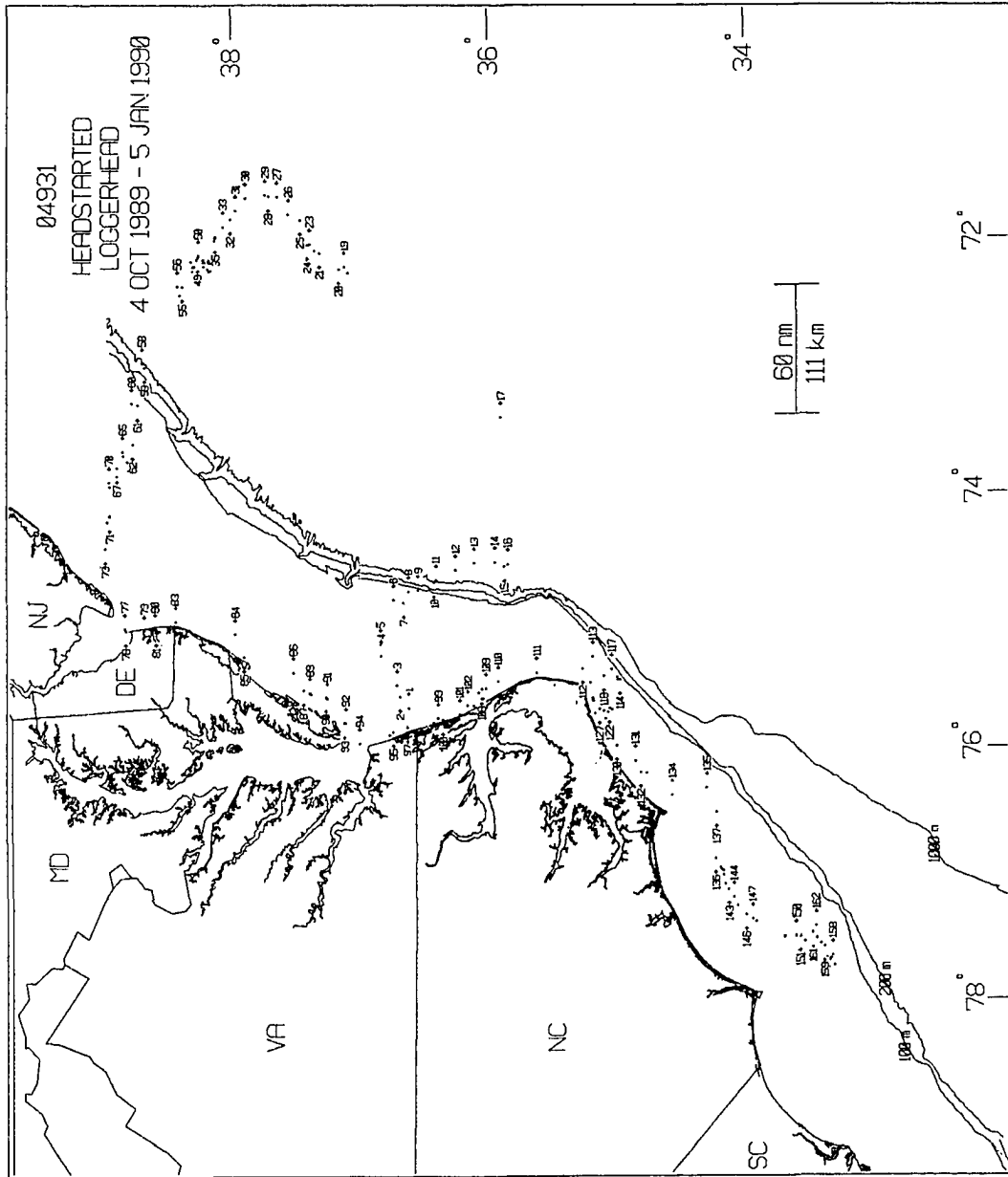


Figure 34. Latitude (squares) and selected temperatures (triangles) as a function of date of loggerhead sea turtle 04931 determined by satellite telemetry.

04931

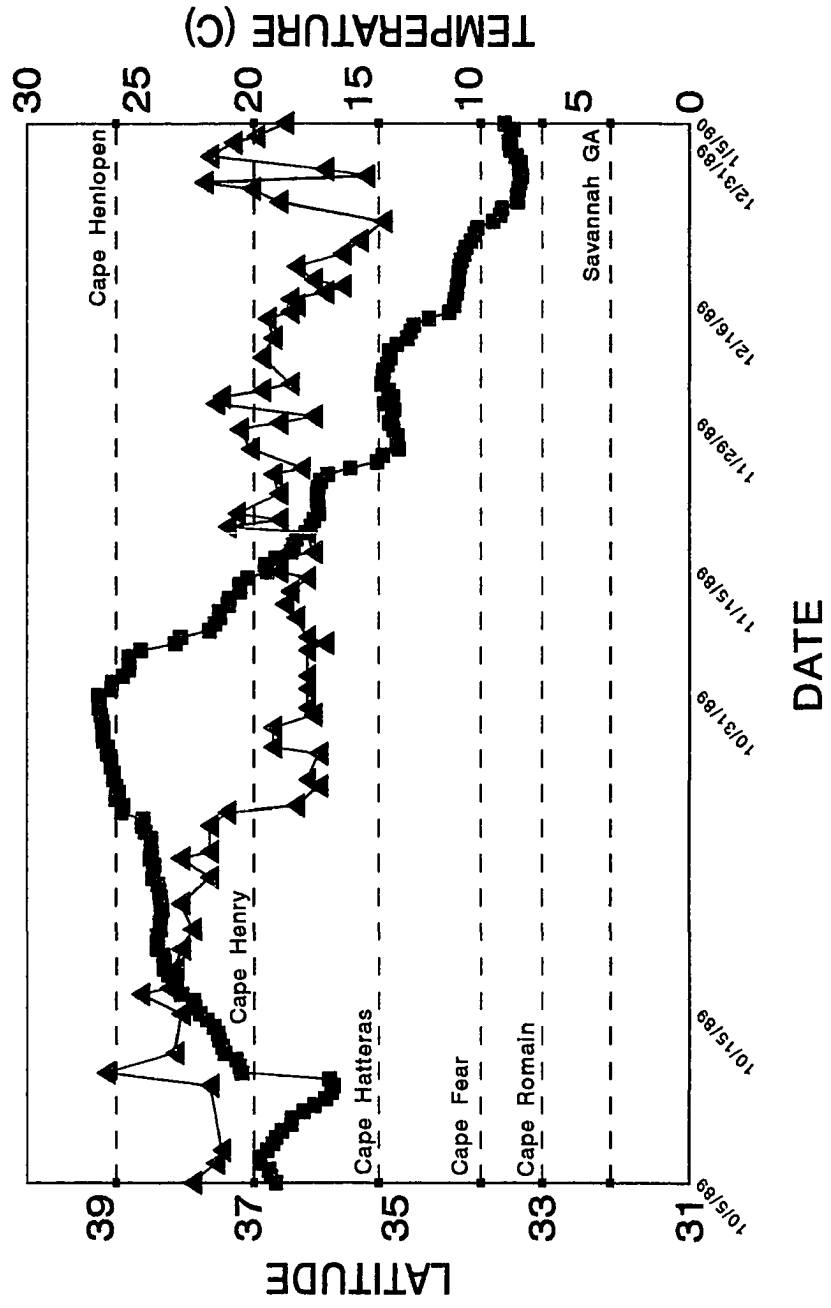
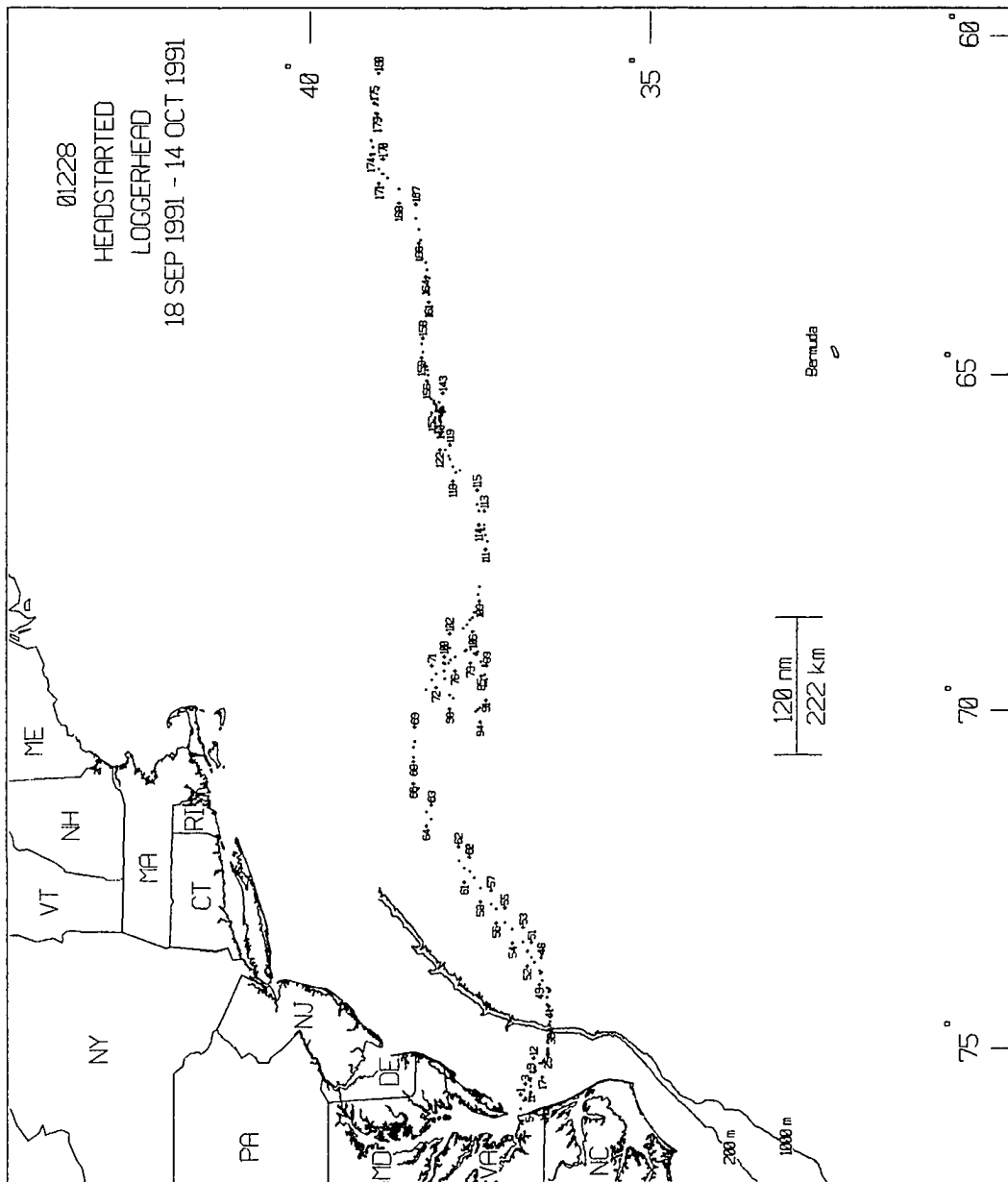


Figure 35. Positions of head-started loggerhead sea turtle 01228 determined by satellite telemetry. The turtle was released at Back Bay National Wildlife Refuge, Virginia Beach, Virginia on 18 September 1991 and the last location was received on 14 October 1991. Numbered points correspond to "POINT NO" in Appendix 14.



the Eastern Shore of Virginia (Figure 36, Appendix 15). The turtle moved at speeds up to 7 km/h, with a mean speed of 1.25 km/h (Table 8, Appendix 15).

Head-started loggerhead 01231 moved offshore, then headed in a southerly direction, entering Pamlico Sound through Oregon Inlet on 22 september. The turtle traveled south-westerly in the sound, and signals ceased on 5 October (Figure 37, Appendix 16). The turtle moved at speeds up to 5 km/h, with a mean speed of 1.48 km/h (Table 8, Appendix 16). The turtle subsequently became trapped in a pound net on 14 October 1991. The turtle was released, and the fishermen reported that the turtle seemed in 'bad shape'.

Head-started loggerhead 01233 traveled south along shore until 10 October, when like turtle 01228, it entered the Gulf Stream and headed across the North Atlantic. Transmission ceased on 17 October, when the turtle was south-east of Cape Cod (Figure 38, Appendix 17). The turtle moved at speeds up to 8 km/h, with a mean speed of 2.01 km/h (Table 8, Appendix 17).

Head-started loggerhead 01234 traveled south, nearshore to Oregon Inlet. The turtle remained in the Oregon Inlet vicinity from 23 September to 25 September when transmissions ceased (Figure 39, Appendix 18). The turtle moved at speeds up to 7 km/h, with a mean speed of 1.64 km/h (Table 8, Appendix 18).

Head-started turtle 04936 was released at BBNWR on 23 October 1991 (Table 7). The turtle traveled south, near shore and rounded Cape Hatteras on 4 November. The turtle reached Ocracoke Inlet on 10 November, then started travelling north-east until 27 November when the turtle was offshore of the Virginia - North Carolina boarder. The turtle then swam north-west until 9 december when it was off the Eastern

Shore of Virginia. The turtle then began a southerly course, and the transmissions ceased on 11 December when the turtle was off Cape Henry, Virginia (Figure 40, Appendix 19). The turtle moved at speeds up to 8 km/h, with a mean speed of 2.00 km/h (Table 8, Appendix 19).

Figure 36. Positions of head-started loggerhead sea turtle 01230 determined by satellite telemetry. The turtle was released at Back Bay National Wildlife Refuge, Virginia Beach, Virginia on 18 September 1991 and the last location was received on 12 October 1991. Numbered points correspond to "POINT NO" in Appendix 15.

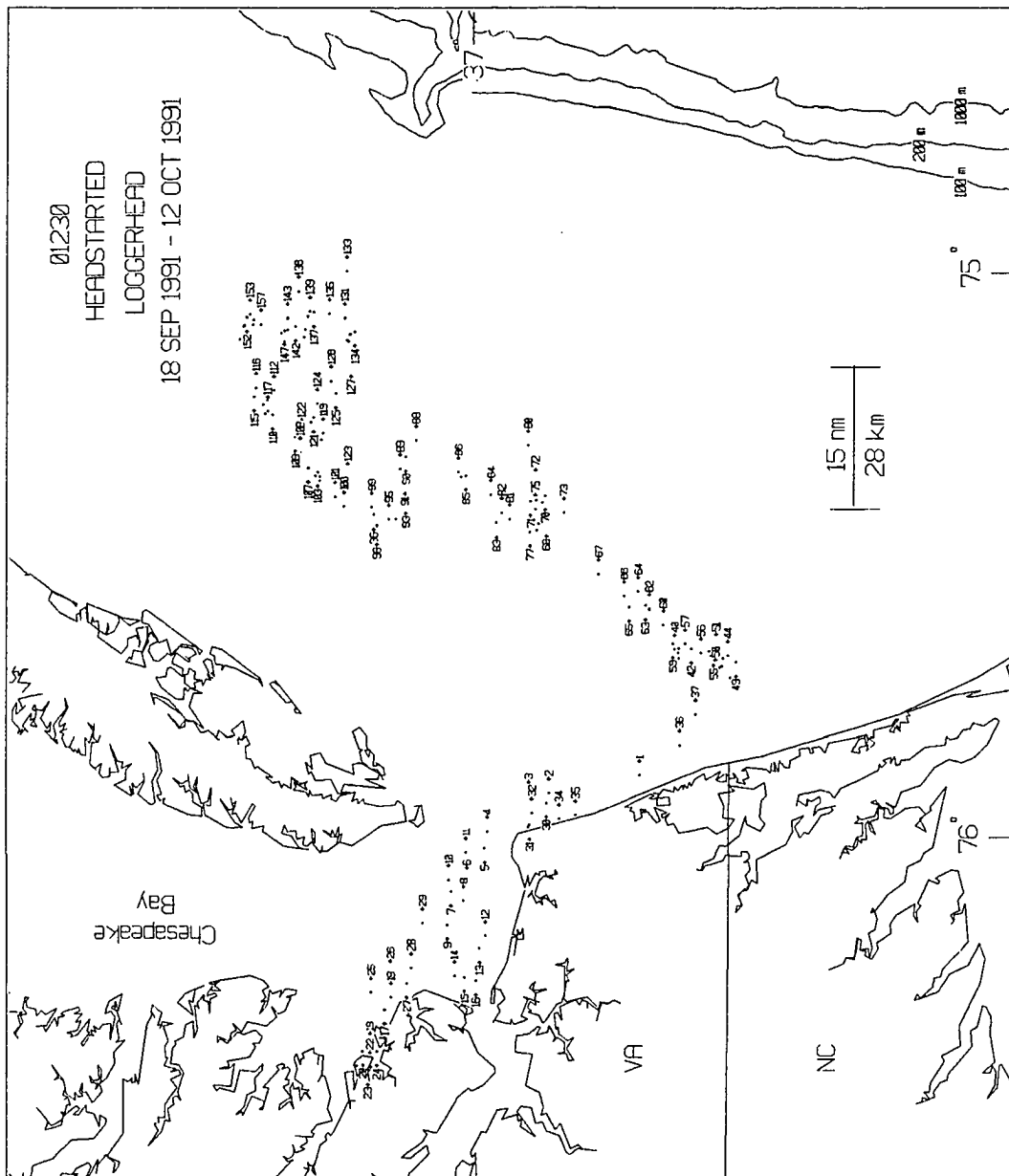


Figure 37. Positions of head-started loggerhead sea turtle 01231 determined by satellite telemetry. The turtle was released at Back Bay National Wildlife Refuge, Virginia Beach, Virginia on 18 September 1991 and the last location was received on 5 October 1991. Numbered points correspond to "POINT NO" in Appendix 16.

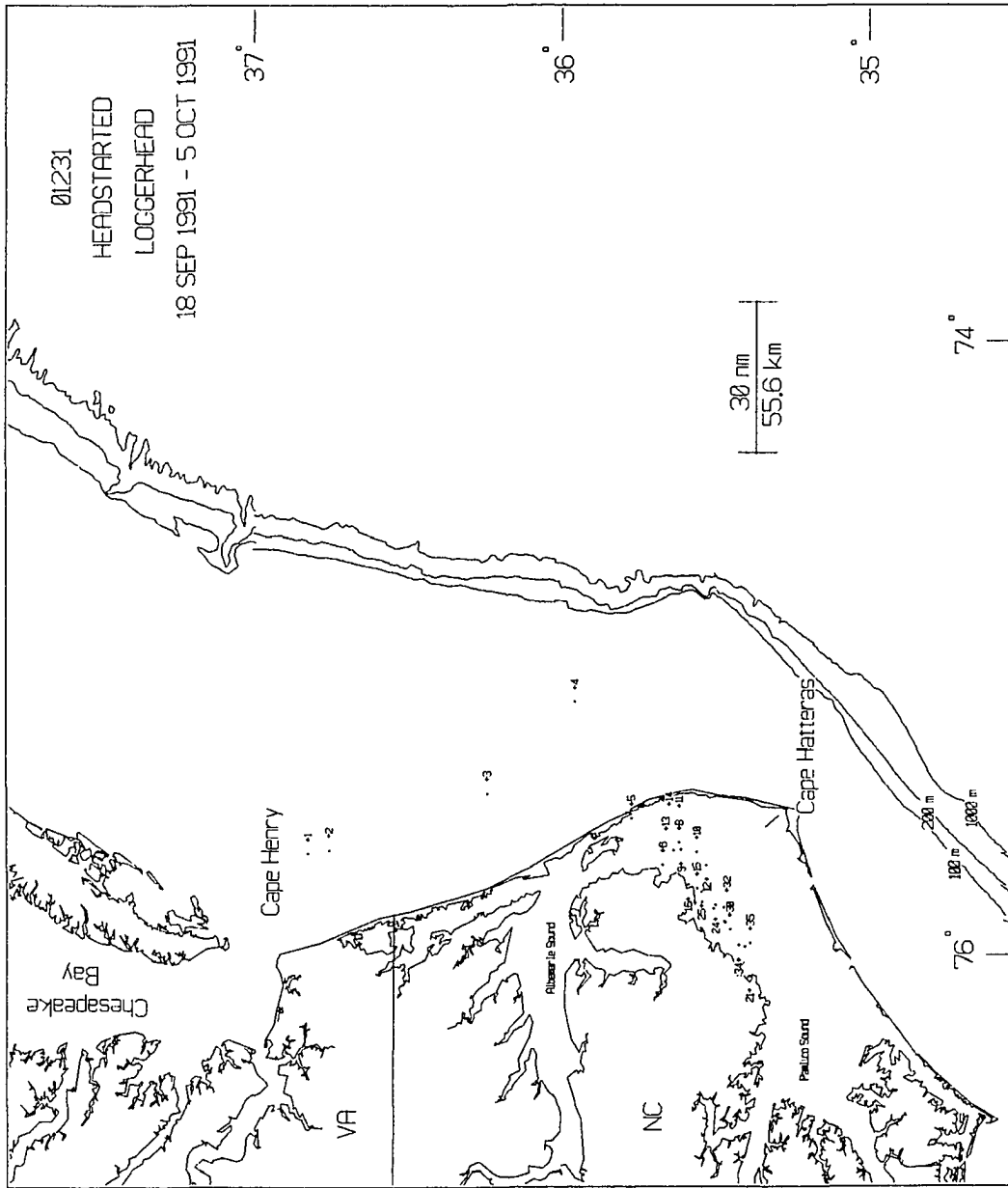


Figure 38. Positions of head-started loggerhead sea turtle 01233 determined by satellite telemetry. The turtle was released at Back Bay National Wildlife Refuge, Virginia Beach, Virginia on 18 September 1991 and the last location was received on 17 October 1991. Numbered points correspond to "POINT NO" in Appendix 17.

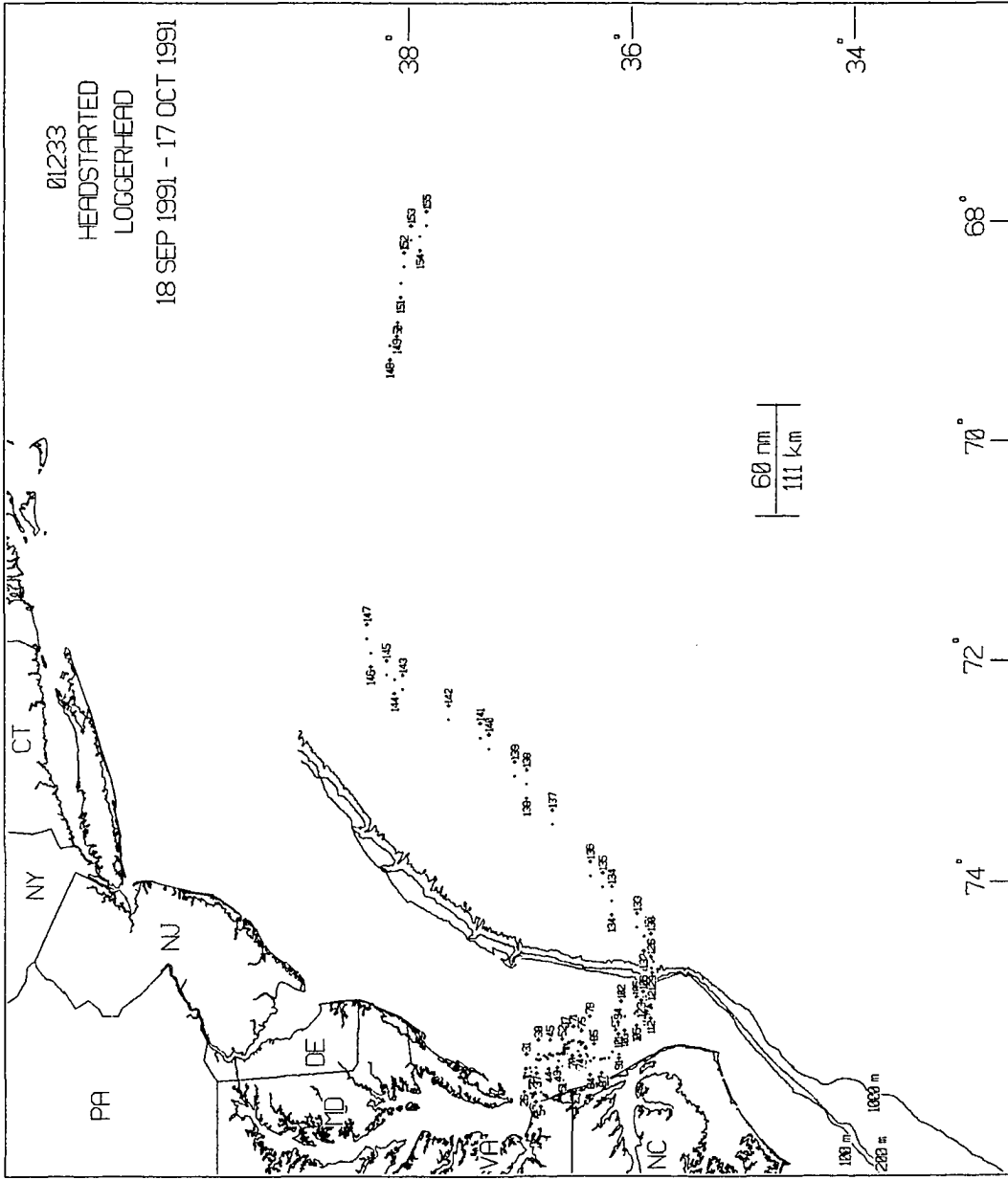


Figure 39. Positions of head-started loggerhead sea turtle 01234 determined by satellite telemetry. The turtle was released at Back Bay National Wildlife Refuge, Virginia Beach, Virginia on 18 September 1991 and the last location was received on 25 September 1991. Numbered points correspond to "POINT NO" in Appendix 18.

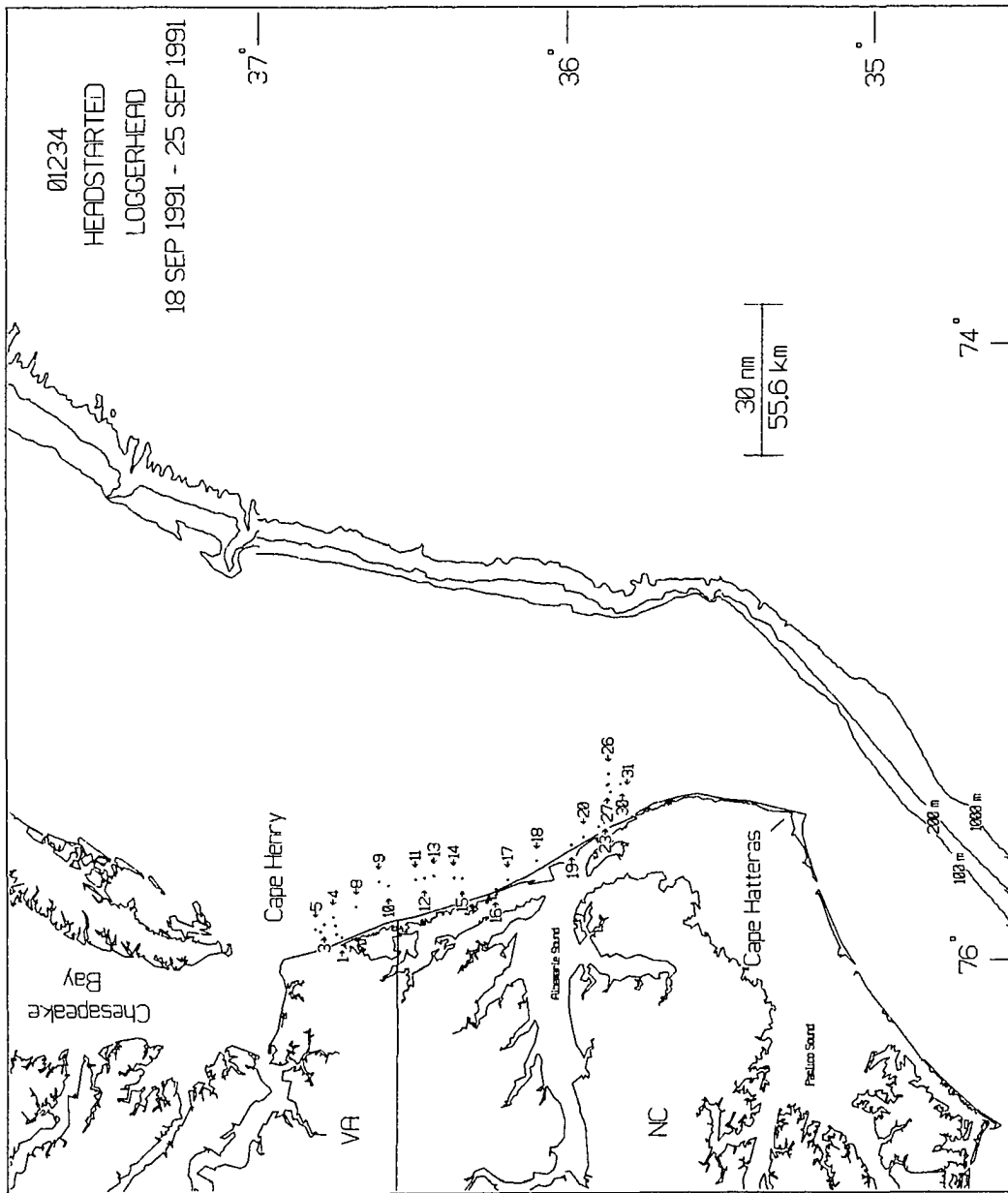
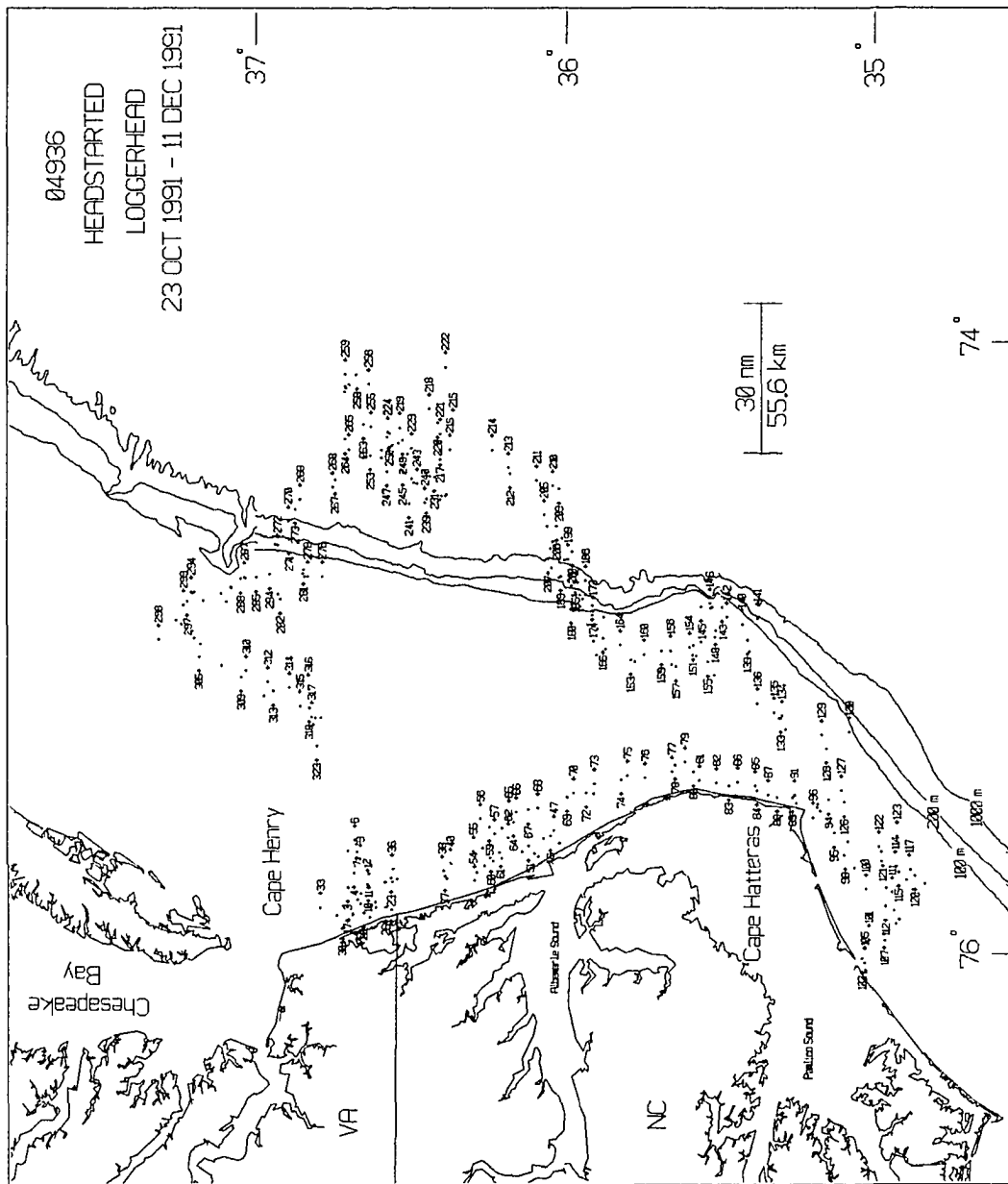


Figure 40. Positions of head-started loggerhead sea turtle 04936 determined by satellite telemetry. The turtle was released at Back Bay National Wildlife Refuge, Virginia Beach, Virginia on 23 October 1991 and the last location was received on 11 December 1991. Numbered points correspond to "POINT NO" in Appendix 19.



TEMPERATURES

Kemp's ridley 1229 traveled from Virginia to north of Cape Fear in 22 days (Table 7, Figures 11 - 12, Appendix 2). During that time the turtle encountered water ranging from 13 - 19 C, and the average temperature was 16.6 C (Table 9, Appendix 20). The temperature increased after the turtle rounded Cape Hatteras, then levelled to approximately 16 C as the turtle traveled south, decreasing to less than 15 C as the turtle approached Cape Fear (Figure 12).

Kemp's ridley 4938 traveled from Virginia to Florida in 83 days (Table 7, Figures 13 - 14, Appendix 3). The turtle encountered temperatures from 14 - 21 C, with an average temperature of 16.7 C (Table 9, Appendix 21). In general, temperatures ranged from 15 - 18 C, with two instances when temperatures were above 20 C (Figure 14). These high temperatures were most likely due to solar input during basking.

Kemp's ridley 4939 traveled from Virginia to Florida in 69 days (Table 7, Figures 15 - 16, Appendix 4). Temperatures ranged from 15 - 23 C, averaging 16.9 C (Table 9, Appendix 22). In general, temperatures were between 15 - 20 C (Figure 16).

Wild loggerhead 4932 traveled from Virginia to southern Florida in 214 days (Table 7, Figures 21 - 22, Appendix 7). Temperatures ranged from 15 - 33 C, averaging 23.1 C (Table 9, Appendix 23). Temperatures remained about 15 - 20 C until the turtle entered Florida's waters, then temperatures steadily increased, up to 30 C (Figure 22).

Wild loggerhead 4933 traveled from Virginia to Florida and back in 226 days (Table 7, Figures 23 - 24, Appendix 8). Temperatures ranged from 9 - 25 C, averaging 18.3 C (Table 9, Appendix 24). As the turtle traveled south into Florida's waters, temperature dropped steadily from 30 C to 18 C, then as the turtle approached Cape Canaveral, temperatures

Table 9. Temperature data from satellite transmitters attached to sea turtles from Virginia. TAG NUMBER = satellite identification code, SD = standard deviation of the mean, N = sample size, MIN = minimum value, MAX = maximum value.

TAG NUMBER	MEAN	SD	N	MIN	MAX
<hr/>					
<u>Kemp's ridleys</u>					
1229	16.55	1.15	30	13	19
4938	16.74	1.27	95	14	21
4939	16.89	1.68	82	15	23
overall	16.77	1.43	207	13	23
<hr/>					
<u>Wild loggerheads</u>					
4932	23.06	4.58	187	15	33
4933	18.26	3.19	236	9	25
4934	20.40	3.53	158	9	32
4937	19.92	3.42	255	12	26
4935	14.54	3.36	162	6	24
1235	25.60	0.87	40	24	27
overall	19.56	4.55	1038	6	33
<hr/>					
<u>Head-started loggerheads</u>					
4931	19.77	2.97	102	14	30
1228	24.67	1.85	49	21	28
1230	19.65	1.70	47	15	24
1231	20.34	0.52	9	20	21
1233	23.36	1.65	55	20	27
1234	21.77	0.56	12	21	23
4936	19.56	2.85	98	15	27
overall	20.95	3.09	372	14	30

increased to ca. 20 C, and the turtle remained in water >18 C until the transmitter ceased transmitting when the turtle was in Chesapeake Bay (Figure 24).

Wild loggerhead 4934 traveled from Virginia, overwintered off Raleigh Bay, and returned to Virginia in 238 days (Table 7, Figures 25 - 26, Appendix 9). Temperatures ranged from 9 - 32 C, averaging 20.4 C (Table 9, Appendix 25). In general, temperatures ranged from 20 - 25 C, until March 1992, when the turtle started on a northerly course to Cape Hatteras and the turtle encountered waters down to 15 C (Figure 26). The turtle then traveled south, to Cape Fear, where the waters warmed to > 20 C. In mid April the turtle again headed north, and again encountered water temperatures to 10 C, however the turtle remained in the Cape Hatteras area until heading north into Chesapeake Bay (Figure 26).

Wild loggerhead 4937 also overwintered off Raleigh Bay, and returned to Virginia in 271 days (Table 7, Figures 27 - 28, Appendix 10). Temperatures ranged from 12 - 26 C, averaging 19.9 C (Table 9, Appendix 26). Temperatures fluctuated from ca. 14 - 22 C throughout the autumn and winter months, until early June, when the turtle started moving north, encountering water temperatures which increased to 25 C (Figure 28).

Wild loggerhead 4935 overwintered in Onslow Bay, returning to Virginia in 210 days (Table 7, Figures 29 - 30, Appendix 11). Temperatures ranged from 6 - 24 C, averaging 14.5 C (Table 9, Appendix 27). Temperatures fluctuated dramatically during the winter months, reaching a low of 6 C in early February. Even when the turtle started its northward migration, temperatures remained below 18 C, down to ca. 12 C (Figure 30).

Nesting loggerhead 1235 immediately traveled south to Florida in 41 days (Table 7, Figures 31 - 32, Appendix 12). Throughout the trip temperatures remained from 24 - 27 C, averaging 25.6 C (Table 9, Figure 32, Appendix 28).

Of the head-started loggerheads, only the 3 yr old turtle (4931) traveled in significant north-south directions (Figures 33 - 34), over 94 days (Table 7, Appendix 13). Temperatures ranged from 14 - 30 C, averaging 19.8 C (Table 9, Appendix 29). As the turtle traveled north in the Gulf Stream, temperatures remained over 20 C, however, as the turtle swam inshore toward Delaware Bay (Figure 33), temperatures dropped to ca. 18 C (Figure 34). Although the turtle began travelling south in early November, temperatures did not increase dramatically. Temperatures remained in the 15 - 20 C range throughout the remainder of the track (Figure 34).

All of the 2 yr old turtle's tracks were of limited duration and geographic range. Temperatures ranged from 15 - 28 C, with averages ranging from 19.5 to 24.7 C (Table 9, Appendices 30 - 35).

Temperatures of Kemp's ridley turtles were the lowest of the three groups, averaging 16.8 C, and also exhibited the smallest variability (Table 9). Wild loggerhead temperatures averaged 19.6 C, with the highest variability, while head-started loggerhead temperatures were the highest, averaging 21.0 C, with intermediate variation (Table 9). This data did not meet parametric assumptions, and a Kruskal Wallis nonparametric analysis of variance (SPSS, 1986) tested significantly ($\chi^2 = 196.8$, $N = 1617$, $P < 0.0001$). A multiple comparison test (Siegel and Castellan, 1988) showed all three groups significantly different from each other at $\alpha = 0.05$.

DIVING BEHAVIOR

Kemp's ridley turtles spent an average of 25.8 to 88.1 minutes submerged per dive in a 12 h period, up to an average of 356 minutes per dive in a 12 h period (Table 10, Appendices 20 - 22). The turtles dove from once during the 12 h period, up to 182 dives per 12 h, with an average of 13.3 to 36.7 dives in a 12 h period (Table 11, Appendices 20 - 22). During these 12 h periods, the turtles spent up to 98.8 percent of the time submerged, with averages ranging from 25.5 to 91.8 percent (Table 12).

Wild loggerhead turtles spent an average of 13.2 to 124.8 minutes submerged per dive in a 12 h period, up to an average of 358 minutes per dive in a 12 h period (Table 10, Appendices 23 - 28). The turtles dove had from 1 to 269 dives per 12 h, with an average of 14.6 to 38.3 dives in a 12 h period (Table 11, Appendices 23 - 28). During these 12 h periods, the turtles spent up to 99.5 percent of the time submerged, with averages ranging from 70.7 to 94.3 percent (Table 12).

Head-started loggerhead turtles spent an average of 8.6 to 47.5 minutes submerged per dive in a 12 h period, up to an average of 237 minutes per dive in a 12 h period (Table 10, Appendices 29 - 35). The turtles dove from once during the 12 h period, up to 291 dives per 12 h, with an average of 25.8 to 116.3 dives in a 12 h period (Table 11, Appendices 29 - 35). During these 12 h periods, the turtles spent up to 99.9 percent of the time submerged, with averages ranging from 36.9 to 74.7 percent (Table 12).

Mean dive duration, transformed by \log_{10} , was the only dive parameter which met parametric assumptions, and ANOVA was used to test for differences between wild loggerheads, head-started loggerheads, and Kemp's ridleys. A nonparametric Kruskal Wallis test was used on the

other variables. Significant differences were observed at the $\alpha = 0.05$ level on all tests (Table 13). The appropriate multiple range tests showed mean dive durations and number of dives in a 12 h period of head-started turtles different from wild loggerheads and Kemp's ridleys, which were not significantly different from each other. Significant differences between percentage of time spent submerged in a 12 h period were observed for all groups (Table 13).

Table 10. Mean dive durations (in minutes) over 12 h periods recorded from satellite transmitters attached to sea turtles from Virginia. TAG NUMBER = satellite identification code, SD = standard deviation of the mean, N = sample size, MIN = minimum value, MAX = maximum value.

TAG NUMBER	MEAN	SD	N	MIN	MAX
<hr/>					
<u>Kemp's ridleys</u>					
1229	25.84	33.46	30	1	116
4938	88.08	70.61	95	4	356
4939	56.41	51.73	82	2	235
overall	66.51	63.09	207	1	356
<hr/>					
<u>Wild loggerheads</u>					
4932	32.62	35.71	187	2	172
4933	64.55	46.32	236	6	236
4934	124.78	94.74	158	5	358
4937	65.07	89.77	255	2	358
4935	114.05	95.67	162	7	356
1235	13.20	6.61	40	4	32
overall	73.84	81.27	1038	2	358
<hr/>					
<u>Head-started loggerheads</u>					
4931	47.54	60.78	102	1	237
1228	8.56	11.47	49	1	48
1230	14.23	15.56	47	2	71
1231	11.53	11.88	9	3	34
1233	13.89	14.96	55	1	77
1234	10.50	10.35	12	2	32
4936	8.55	15.90	98	2	121
overall	20.89	37.84	372	1	237

Table 11. Number of dives over 12 h periods recorded from satellite transmitters attached to sea turtles from Virginia. TAG NUMBER = satellite identification code, SD = standard deviation of the mean, N = sample size, MIN = minimum value, MAX = maximum value.

TAG NUMBER	MEAN	SD	N	MIN	MAX
<hr/>					
<u>Kemp's ridleys</u>					
1229	13.28	14.16	30	1	52
4938	19.17	27.20	95	2	155
4939	36.68	44.88	82	3	182
overall	25.25	35.33	207	1	182
<hr/>					
<u>Wild loggerheads</u>					
4932	33.14	24.72	187	4	98
4933	19.00	16.55	236	3	89
4934	14.63	20.63	158	2	151
4937	37.01	40.36	255	2	269
4935	15.52	18.02	162	1	84
1235	38.25	21.65	40	10	82
overall	25.51	81.27	1038	1	269
<hr/>					
<u>Head-started loggerheads</u>					
4931	25.85	25.61	102	2	99
1228	66.33	39.79	49	5	158
1230	65.11	58.10	47	2	222
1231	31.33	27.60	9	9	81
1233	67.16	53.38	55	6	201
1234	107.75	77.70	12	21	228
4936	116.25	76.85	98	2	291
overall	68.84	64.37	372	1	291

Table 12. Percent of time spent submerged over 12 h periods recorded from satellite transmitters attached to sea turtles from Virginia. TAG NUMBER = satellite identification code, SD = standard deviation of the mean, N = sample size, MIN = minimum value, MAX = maximum value.

TAG NUMBER	MEAN	SD	N	MIN	MAX
<hr/>					
<u>Kemp's ridleys</u>					
1229	25.52	30.86	30	0.14	96.86
4938	91.80	6.56	95	52.81	98.82
4939	89.90	13.81	82	21.10	98.72
overall	81.44	27.61	207	0.14	98.82
<hr/>					
<u>Wild loggerheads</u>					
4932	81.54	30.72	187	8.33	98.56
4933	94.00	10.50	236	8.60	98.87
4934 (M)	93.45	13.44	158	8.75	99.40
4937 (M)	83.15	29.39	255	8.19	99.53
4935	94.31	9.70	162	9.49	99.01
1235 (N)	70.69	37.47	40	8.89	96.56
overall	88.16	81.27	1038	8.19	99.53
<hr/>					
<u>Head-started loggerheads</u>					
4931	58.07	39.36	102	3.75	99.94
1228	44.23	30.54	49	2.47	89.40
1230	44.00	21.06	47	6.81	92.87
1231	36.88	32.31	9	3.87	93.53
1233	58.90	24.41	55	2.71	90.53
1234	74.71	21.27	12	27.44	90.83
4936	57.15	23.19	98	13.84	91.02
overall	54.38	30.29	372	2.47	99.94

Table 13. Results of statistical comparisons of Kemp's ridley (LK), wild loggerhead (CC), and head-started loggerhead (HS) sea turtle mean dive durations in 12 h periods, number of dives in 12 h periods, and percentage of time spent submerged in 12 h periods. TEST TYPE: K/W = nonparametric Kruskal Wallis one way analysis of variance, ANOVA = parametric one way analysis of variance (SPSS, 1986). N = 1617 for each test. PROB = probability, M.R.T. = results of multiple range tests in underline notation, lowest value to left; HC = head-started loggerheads, WC = wild loggerhead, LK = Kemp's ridley. Duncan's multiple range test (SPSS, 1986) was used for parametric results, multiple comparisons between groups for nonparametric results according to Siegel and Castellan (1988).

PARAMETER	TEST TYPE	TEST RESULT	PROB	M.R.T.
Mean dive duration	ANOVA	F = 230.3	0.0000**	HC <u>LK WC</u>
Number of dives	K/W	X ² = 187.3	0.0000**	<u>LK WC</u> HC
Percent submerged	K/W	X ² = 511.6	0.0000**	HC LK WC

DISCUSSION

Wild turtles

Hatchling loggerheads and Kemp's ridleys enter major oceanic currents (such as the North Atlantic gyre) for the first few years of their lives (Carr, 1986a, 1986b). At approximately 40 cm carapace length (CL), loggerhead turtles (and smaller Kemp's ridleys) adopt benthic habits in lagoon, estuaries, and mouths of bays and rivers (Dodd, 1988; Ogren, 1989) which are rich in food resources. Although Morreale et al. (1992) suggested that Kemp's ridleys found in Long Island Sound are of a single year class (this may be the beginning of the benthic habit for Kemp's ridley), and do not return in subsequent seasons, flipper tagging showed that individuals of both Kemp's ridley and loggerheads utilize Chesapeake Bay for more than one season. This is reflected in the large size ranges of individuals found in Virginia's waters (35 - 105 cm CL for loggerheads, 20 - 60 cm CL for Ridleys, Bellmund et al., 1987; Musick et al., 1985a).

In general, population densities of loggerheads reached a maximum from Cape Hatteras south in April with a secondary peak in November. North of Cape Hatteras population densities were highest in May with a secondary peak in November. The high density estimates observed on 6 August 1985, 4 July 1986, 29 July 1988, and 8 July 1992 may have been due to changes in the turtles' surfacing behavior rather than to real increases in standing stocks. The coastal region from Cape Hatteras to New Jersey is subject to periodic upwelling caused by prolonged

southwesterly winds in July and August (Hicks and Miller, 1980; Ingham and Eberwine, 1984; Norcross and Austin, 1988; Wells and Gray, 1960). This phenomenon pulls in cold bottom water from offshore and establishes a strong thermocline. Loggerheads tend not to swim through a strong thermocline, and may spend more time on the surface (Keinath and Musick, Unpub. data).

Standing stocks of turtles in the 1991 - 1992 study areas during the spring migration were between 2000 - 3000 turtles, while less than 1000 turtles were observed during the southward fall migration. The large number of turtles observed during the northward migration probably reflects turtles concentrated behind fronts of cool water to the north. Although lower than the standing stock of the lower Chesapeake Bay (ca. 7000) calculated by Byles (1988), the number of turtles estimated travelling through these three zones are a significant number of turtles which overwinter in Chesapeake Bay. Shoop and Kenney (1992) estimated >7000 loggerheads inhabit the offshore waters of the continental shelf from Nova Scotia to Cape Hatteras during summer months, with fewer turtles present during spring (ca. 1500) and fall (ca. 3000), with virtually no turtles present during the winter. These numbers are much lower than estimated in the present study, and may reflect temporal and geographic differences in sampling coverage and differences in survey methods and standing stock calculations (Shoop and Kenney, 1992 did not account for submerged turtles). Accounting for submerged turtles, Shoop and Kenney's (1992) data suggested numbers of loggerheads (ca. 7000 - 15,000) present from Virginia to Cape Hatteras during the spring and autumn which are larger than (but comparable to) the numbers estimated in the present (small) study area.

Aerial surveys and satellite telemetry showed that loggerheads

migrated south from waters north of Cape Hatteras in the autumn, rounding Cape Hatteras during October and November. Once south of Hatteras, telemetered loggerheads either became pelagic in deep oceanic waters (one loggerhead), traveled nearshore to Florida (two loggerheads), over-wintered off North Carolina in the west side of the Gulf Stream (three loggerheads), or transmissions ceased shortly after rounding the Cape. One loggerhead which overwintered off Florida and three which overwintered off North Carolina returned to the Chesapeake Bay the following year, rounding Cape Hatteras during May. Aerial surveys also detected a northerly spring migration past Cape Hatteras in May. These migratory patterns are consistent with data collected on other aerial surveys (CeTAP, 1982a, 1982b; Shoop et al., 1981; Shoop and Kenney, 1992).

Byles (1988) satellite tagged two loggerhead turtles in 1985. One turtle which was released off the mouth of the Chesapeake Bay traveled south nearshore, similarly to the turtles in this study, but then entered Pamlico Sound through Oregon Inlet when the transmitter detached from the turtle after 36 days. The other turtle was released off Oregon Inlet on 21 November. Like the turtles tracked in this study, the turtle traveled south, near shore, past Cape Lookout, but became pelagic in the Gulf Stream during mid-December, travelling north until transmissions ceased. This behavior is similar to turtle number 5784, which became pelagic in the Gulf Stream. Because of the large size of these early transmitters, the instrumented turtles were of a relatively large size (> 80 cm). The pelagic behavior was initially thought to be related to near adult-sized turtles, but latter tracks of large turtles (4934, 4937) refuted that hypothesis. It may be possible that the release sites of the turtles (far from their original capture site in

Chesapeake Bay) accounted for the pelagic behavior, or that the presence of the large, trailing transmitters affected their behavior. However, open ocean movement of a juvenile loggerhead has been reported (Eckert and Martins, 1989).

Two other overwintering strategies were observed in loggerheads: migrating south to warm water, or offshore to warm Gulf Stream waters over reef habitats (Newton et al., 1971). The former strategy was exhibited by two juveniles, and was similar to the migratory route presumably taken by a juvenile loggerhead which I flipper tagged in Rhode Island and latter washed up dead on Cumberland Island, Georgia (Shoop and Ruckdeschel, 1989). The latter strategy was displayed by two (near?) adult males and an average-sized juvenile, discounting a migratory destination preference due to differing age classes. Bowen (pers. com.) found genetic differences between the loggerhead nesting population in Florida and nesters to the north, and if a genetic difference exists, one would expect turtles hatched in the north to overwinter off the northern beaches, and conversely turtles hatched in Florida to overwinter off Florida. However, if there were a difference in overwintering strategies due to genetic differences (birthplace), one would not expect the loggerhead satellite tagged while nesting in Virginia to migrate to Florida. Conversely meteorological conditions may dictate migratory destinations. If winter temperatures are moderate, it would be energetically advantageous to overwinter off North Carolina instead of swimming to Florida. Alternately, rapid onset of cold weather may dictate migration: If the autumn temperatures are mild over a long period turtles would have sufficient time to migrate south close to shore. But if temperatures drop quickly, turtles may respond by swimming to warm offshore waters. In this scenario, it would be

energetically advantageous to remain in warm Gulf Stream waters rather than swim south against the northerly current. The paucity of flipper tag returns from the south suggests that overwintering off North Carolina may be a prevalent strategy.

Two of the three Kemp's ridleys were tracked south to Florida in the autumn, consistent with flipper tag returns. It is unlikely that Kemp's ridleys would overwinter in deeper offshore waters, since this species is characterized as a shallow water benthic forager (< 50 m; Shaver, 1991). Although Kemp's ridleys are hard to detect by aerial survey, relative temporal and geographic trends in ridley population abundance probably closely reflect those of loggerheads (but absolute abundance is much lower). The tracking data suggest that ridleys migrate through the Hatteras migration corridor at the same time as loggerheads.

All the turtles which migrated to Florida (three loggerheads and two ridleys) remained inshore of the Gulf Stream, reducing energetic output. Surface water drift south of Cape Fear is southerly (Barans and Roumillat, 1976), and turtles may obtain an energetic advantage by utilizing these currents for southerly transport. However, the loggerhead which migrated north to Chesapeake Bay from Florida in the spring (4933) utilized the same routes in both directions. If the currents are consistent seasonally, no net advantage would have been realized.

Speeds attained by both wild loggerheads and Kemp's ridleys were relatively consistent. Speeds up to 6 km/h were attained by both species, possibly due to local currents, although long term mean speeds were 1 - 2 km/hr. These speeds probably underestimate speeds attained while actively migrating, since turtles appear to "stop and rest" at

certain areas. These areas may be inlet channels, preferred feeding areas, or simply areas which possess elevated temperatures adequate for foraging. Swimming speeds of loggerheads and Kemp's ridleys are comparable to leatherbacks, although leatherbacks can attain faster burst speeds (Keinath and Musick, in press).

During autumn and winter, Kemp's ridley turtles remained in water temperatures consistently between 15 and 20 C, while loggerheads experienced temperatures ranging both higher and lower. In many instances, turtles were relatively sedentary when temperatures dropped, and in response the animals traveled south to warmer waters. The two loggerheads which migrated to Florida experienced the coolest temperatures from the beginning of their migration until late December or early January, when the turtles were between Savannah, Georgia and Cape Canaveral, Florida. Upon reaching Cape Canaveral, water temperatures increased to over 18 C.

The two loggerheads which overwintered off Cape Fear experienced temperatures consistently between 15 - 25 C, while the turtle which overwintered off Cape Hatteras experienced more widely fluctuating temperatures around 15 C. During March and April, all three turtles made northerly excursions, experiencing cold water temperatures, and in response the animals traveled south into warmer waters.

Although temperatures as low as 6 C were recorded, it appears that turtles move south into warmer waters in response to temperatures which approach 15 C, lower than that (18 C) suggested by Lutcavage and Musick (1985) and substantially lower than the temperature (22 C) where most loggerheads were observed on offshore aerial surveys (Shoop and Kenney, 1992). Although 15 C is generally accepted as a lower limit for occurrences of wild sea turtles, the lower temperatures experienced are

close to lethal. Schwartz (1978) reported that prolonged exposure to 5.0 - 6.5 C is lethal to loggerheads and ridleys, and that turtles bob to the surface when exposed to water temperatures below 10 C. Barco and Pitchford (1990) reported four loggerheads and one Kemp's ridley which stranded in response to 10 C water temperatures in Virginia waters. However, Anonymous (1992) reported turtle sightings off North Carolina in waters as cold as 6 C, and trawled turtles in waters 10 C, all with no apparent signs of cold stunning. It appears that at least some turtles can tolerate temperatures as low as 6 C, although 10 C may be marginal. However, although temperatures experience by wild turtles fluctuated between 6 - 30 C at certain times, overall the temperatures remained within a range of 15 - 25 C.

Loggerhead and Kemp's ridleys exhibited a wide range of dive durations and number of dives per 12 h period. Byles (1988) reported mean dive durations of ridleys in Chesapeake Bay of 12.7 min, and 18.9 min for loggerheads, and Keinath (1986) reported dive durations of 2 - 5 min for loggerheads off Rhode Island. Because of the need for increased oxygen exchange due to swimming activity, one would expect migrating turtles to exhibit shorter dive times than exhibited by the sedentary turtles studied by Byles (1988). However, with the exception of one Kemp's ridley and the nesting loggerhead, turtles spent 80 - 94% of the time submerged, or 6 - 20% of the time at the surface, more than the 5% reported by Byles for summer resident loggerheads in Chesapeake Bay. This data may be further confounded since some turtles which migrated south subsequently became sedentary for the winter months. Turtle 1235, which immediately migrated south showed lower mean submergence duration and percentage of time submerged than reported by Byles (1988) for sedentary loggerheads and may be more representative of turtles in

active migration.

The respiratory behavior of one Kemp's ridley (1229) was dramatically different from the other ridley's, spending more time at the surface, and this lack of underwater activity contributed to the short duration of the track. This turtle had one front flipper missing, presumably from a large fish attack, and had been rehabilitated at VIMS for the previous few years. Perhaps this physical challenge contributed to the abnormal diving behavior, however the movements and, surprisingly speed, of the turtle were consistent with the other ridleys.

Head-started turtles

Movements and diving behavior of head-started loggerheads were different than wild loggerheads. Head-started loggerheads which remained in the coastal area exhibited swimming speeds comparable to wild loggerheads, however speeds of turtles which entered the Gulf Stream were greater, probably reflecting the movement of that system. Two year old loggerheads which inhabit the Gulf Stream spend a majority of the time at the surface, foraging on infauna, and although the size of the head-started turtles in this study were representative of 7 - 10 year old turtles (Klinger and Musick, 1992), it appears that the head-started turtles acted more like two year olds: number of dives per 12 h period was greater than wild turtles, and dive durations and amount of time spent submerged was small compared to wild turtles. Like Kemp's ridley 1229, the small amounts of time spent submerged probably contributed to the short track durations because of battery drain.

The track of one head-started turtle (4931) was significantly longer than the other turtles, and this was the only 3 yr old turtle studied. Initially this turtle moved into the Gulf Stream but after moving in-shore, it began to migrate south, similar to wild turtles. In

addition, this turtle made less frequent dives and spent more time submerged per dive than the 2 yr olds, although the percent of time spent submerged per 12 hr period was similar among most of the head-started turtles. Perhaps the switch from a pelagic to benthic habitat of wild loggerheads occurs between 2 and 3 years of age. Additional (and longer term) studies of 2 and 3 yr old head-started loggerheads may reveal the abilities of head-started turtles to adapt to the wild, and the timing of adoption of benthic habitats.

Because of the short durations of tracks of the other 2 yr old turtles, the longer term movements of these turtles is unknown, but the two turtles which entered the North Atlantic gyre certainly could not have returned to a near-shore migratory pattern. Three of the other head-started turtles may have begun a southerly migration after cessation of signals. Conversely, the time between the two age classes may be the time when pelagic turtles begin a benthic habit, but longer duration experiments must be undertaken.

The final result of head-starting sea turtles, to increase the populations of nesting females, has not been realized, and the present study suggests that head-starting may be a futile process. Head-started loggerheads do not appear to behave as wild turtles and seem to lack migratory or navigational skills exhibited by wild loggerheads of similar size. The fast growth rates (compared to wild turtles) exhibited by head-started turtles confounds the practice. Head-started turtles are released in areas where neither their size (or age) cohorts are found. If head-starting continues, studies into locations of wild turtles of similar size and ages should be initiated, and head-started turtles should be released in those areas. However, it remains uncertain that those turtles would survive. The time and funds

presently appropriated for head-starting would be better allocated for protecting nests and nesting beaches, along with protecting larger sized individuals (Crouse et al., 1987), and implementation of conservation oriented fishing practices (Committee on Sea Turtle Conservation, 1990).

APPENDICES

Appendix 1. Data from aerial surveys flown from 1985 - 1989. Line numbers are shown in Figure 1.

Date	Line Number	Linear Km Surveyed	Total distance surveyed (km)
18 Apr 85	32	8.4	181.4
	31	25.0	
	30	18.5	
	29	18.5	
	28	18.5	
	27	18.5	
	26	18.5	
	25	18.5	
	24	18.5	
	23	18.5	
26 Apr 85 check on these lines	32	8.4	181.4
	31	25.0	
	30	18.5	
	29	18.5	
	28	18.5	
	27	18.5	
	26	18.5	
	25	18.5	
	24	18.5	
	23	18.5	
01 May 85	7	24.1	68.6
	8	44.5	
02 May 85	7	24.1	68.6
	8	44.5	
25 May 85	8	44.5	44.5
06 Aug 85	7	24.1	59.3
	8	35.2	
05 Sep 85	7	24.1	68.6
	8	44.5	
10 Oct 85	7	24.1	68.6
	8	44.5	
15 Oct 85	15	27.8	135.2
	14	18.5	
	11	24.1	
	9	18.5	
	6	18.5	
	3	27.8	
	11 Nov 85	24	
23	18.5		
22	18.5		
19	27.8		
17	18.5		
15	27.8		
14	18.5		
11	24.1		
7	24.1		
8	35.2		

Appendix 1. Continued.

Date	Line Number	Linear Km Surveyed	Total distance surveyed (km)
20 Nov 85	29	18.5	74.0
	28	18.5	
	27	18.5	
30 Apr 86	25	18.5	190.7
	25	18.5	
	24	18.5	
	23	18.5	
	22	18.5	
	19	27.8	
	17	18.5	
	15	27.8	
07 May 86	14	18.5	316.5
	11	24.1	
	32	8.3	
	31	25.0	
	30	18.5	
	29	18.5	
	28	18.5	
	27	18.5	
	26	18.5	
	25	18.5	
	24	18.5	
	23	18.5	
	22	18.5	
	19	27.8	
	17	18.5	
16 May 86	15	27.8	59.3
	14	18.5	
19 May 86	11	24.1	196.3
	7	24.1	
	8	35.2	
	23	18.5	
	22	18.5	
	19	27.8	
	17	18.5	
	15	27.8	
14	18.5		
	11	24.1	
	9	18.5	
	7	24.1	

Appendix 1. Continued.

Date	Line Number	Linear Km Surveyed	Total distance surveyed (km)
30 May 86	23	18.5	272.2
	22	18.5	
	19	27.8	
	17	18.5	
	15	27.8	
	14	18.5	
	11	24.1	
	9	12.9	
	7	24.1	
	6	18.5	
	3	27.8	
	8	35.2	
	19 Jun 86	15	
14		18.5	
11		24.1	
9		12.9	
7		24.1	
6		18.5	
3		27.8	
8		35.2	
04 Jul 86	15	27.8	188.9
	14	18.5	
	11	24.1	
	9	12.9	
	7	24.1	
	6	18.5	
	3	27.8	
	8	35.2	
10 Jul 86	15	27.8	188.9
	14	18.5	
	11	24.1	
	9	12.9	
	7	24.1	
	6	18.5	
	3	27.8	
	8	35.2	
26 Jul 86	7	24.1	105.6
	6	18.5	
	3	27.8	
	8	35.2	
04 Aug 86	15	27.8	188.9
	14	18.5	
	11	24.1	
	9	12.9	
	7	24.1	
	6	18.5	
	3	27.8	
	8	35.2	

Appendix 1. Continued.

Date	Line Number	Linear Km Surveyed	Total distance surveyed (km)
15 Aug 86	15	27.8	188.9
	14	18.5	
	11	24.1	
	9	12.9	
	7	24.1	
	6	18.5	
	3	27.8	
	8	35.2	
21 Aug 86	15	27.8	188.9
	14	18.5	
	11	24.1	
	9	12.9	
	7	24.1	
	6	18.5	
	3	27.8	
	8	35.2	
05 Sep 86	19	27.8	188.9
	17	18.5	
	15	27.8	
	14	18.5	
	11	24.1	
	9	12.9	
	7	24.1	
	8	35.2	
23 Sep 86	23	18.5	272.2
	22	18.5	
	19	27.8	
	17	18.5	
	15	27.8	
	14	18.5	
	11	24.1	
	9	12.9	
	7	24.1	
	6	18.5	
23 Oct 86	3	27.8	272.2
	8	35.2	
	23	18.5	
	22	18.5	
	19	27.8	
	17	18.5	
	15	27.8	
	14	18.5	
	11	24.1	
	9	12.9	
7	24.1		
6	18.5		
3	27.8		
8	35.2		

Appendix 1. Continued.

Date	Line Number	Linear Km Surveyed	Total distance surveyed (km)
24 Oct 86	32	8.3	162.8
	31	25.0	
	30	18.5	
	29	18.5	
	28	18.5	
	27	18.5	
	26	18.5	
	25	18.5	
	24	18.5	
20 Nov 86	32	8.3	162.8
	31	25.0	
	30	18.5	
	29	18.5	
	28	18.5	
	27	18.5	
	26	18.5	
	25	18.5	
	24	18.5	
23 Nov 86	23	18.5	272.2
	22	18.5	
	19	27.8	
	17	18.5	
	15	27.8	
	14	18.5	
	11	24.1	
	9	12.9	
	7	24.1	
	6	18.5	
	3	27.8	
06 Dec 86	8	35.2	162.8
	32	8.3	
	31	25.0	
	30	18.5	
	29	18.5	
	28	18.5	
	27	18.5	
	26	18.5	
	25	18.5	
24	18.5		
16 Sep 87	23	27.8	213.1
	20	18.5	
	19	27.8	
	18	20.4	
	15	27.8	
	12	20.4	
	11	27.8	
	10	18.5	
	7	24.1	

Appendix 1. Continued.

Date	Line Number	Linear Km Surveyed	Total distance surveyed (km)
03 Dec 87	23	27.8	259.4
	20	18.5	
	19	27.8	
	18	20.4	
	15	27.8	
	12	20.4	
	11	27.8	
	10	18.5	
	7	24.1	
	4	18.5	
07 Jun 88	3	27.8	246.5
	23	27.8	
	20	18.5	
	19	27.8	
	18	20.4	
	15	27.8	
	12	20.4	
	11	27.8	
	10	16.7	
	7	24.1	
14 Jul 88	8	35.2	246.5
	23	27.8	
	20	18.5	
	19	27.8	
	18	20.4	
	15	27.8	
	12	20.4	
	11	27.8	
	10	16.7	
	7	24.1	
15 Jul 88	8	35.2	339.1
	23	27.8	
	20	18.5	
	19	27.8	
	18	20.4	
	15	27.8	
	12	20.4	
	11	27.8	
	10	16.7	
	7	24.1	
	4	18.5	
	3	27.8	
	2	18.5	
	1	27.8	
	8	35.2	

Appendix 1. Continued.

Date	Line Number	Linear Km Surveyed	Total distance surveyed (km)
29 Jul 88	23	27.8	335.4
	20	18.5	
	19	27.8	
	18	20.4	
	15	27.8	
	12	20.4	
	11	27.8	
	10	13.0	
	7	24.1	
	4	18.5	
	3	27.8	
	2	18.5	
	1	27.8	
	8	35.2	
11 Aug 88	23	27.8	261.3
	20	18.5	
	19	27.8	
	18	20.4	
	15	27.8	
	12	20.4	
	11	27.8	
	10	13.0	
	7	24.1	
	8	53.7	
27 Oct 88	23	27.8	277.9
	20	18.5	
	19	27.8	
	18	20.4	
	15	27.8	
	12	20.4	
	11	27.8	
	10	18.5	
	7	24.1	
	4	18.5	
	3	27.8	
2	18.5		

Appendix 1. Continued.

Date	Line Number	Linear Km Surveyed	Total distance surveyed (km)
25 Jul 89	32	8.3	414.8
	31	25.0	
	30	18.5	
	29	18.5	
	28	18.5	
	27	18.5	
	26	18.5	
	25	18.5	
	24	18.5	
	23	18.5	
	20	18.5	
	19	27.8	
	18	20.4	
	15	27.8	
	12	20.4	
	11	27.8	
	10	13.0	
	7	24.1	
	8	53.7	

Appendix 2. Data from Kemp's ridley 1229 tracked via satellite in 1991. POINT NO. corresponds to numbered points in Figure 11. TIME in Greenwich mean time, LAT = north latitude, LONG = west longitude, TSLL = time since last location in minutes, DSLL = distance since last location in km, SPEED = speed since last location in km/h.

POINT NO.	DATE	TIME (GMT)	LAT	LONG	TSLL (m)	DSLL (km)	SPEED (km/h)
1	24-Oct-1991	9:21:42	36.674	75.903			
2	24-Oct-1991	22:38:38	36.643	75.891	796.93	3.61	0.27
3	25-Oct-1991	0:22:14	36.658	75.855	103.60	3.62	2.10
4	25-Oct-1991	9:13:35	36.641	75.877	531.35	2.72	0.31
5	25-Oct-1991	17:14:47	36.615	75.857	481.20	3.40	0.42
6	26-Oct-1991	12:18:51	36.645	75.890	1144.07	4.45	0.23
7	26-Oct-1991	13:58:15	36.639	75.879	99.40	1.19	0.72
8	26-Oct-1991	20:23:27	36.597	75.872	385.20	4.71	0.73
9	26-Oct-1991	23:41:27	36.596	75.840	198.00	2.86	0.87
10	27-Oct-1991	11:56:17	36.546	75.860	734.83	5.84	0.48
11	27-Oct-1991	13:38:13	36.511	75.852	101.93	3.96	2.33
12	27-Oct-1991	15:14:23	36.473	75.811	96.17	5.59	3.49
13	27-Oct-1991	18:27:57	36.459	75.844	193.57	3.34	1.03
14	27-Oct-1991	20:11:57	36.453	75.838	104.00	0.86	0.49
15	27-Oct-1991	23:11:21	36.411	75.821	179.40	4.91	1.64
16	28-Oct-1991	8:37:36	36.325	75.799	566.25	9.76	1.03
17	28-Oct-1991	13:17:29	36.270	75.779	279.88	6.37	1.37
18	28-Oct-1991	14:53:33	36.252	75.740	96.07	4.03	2.52
19	28-Oct-1991	20:00:16	36.148	75.719	306.72	11.71	2.29
20	28-Oct-1991	22:55:28	36.079	75.676	175.20	8.59	2.94
21	29-Oct-1991	8:24:03	35.846	75.521	568.58	29.42	3.10
22	29-Oct-1991	14:34:37	35.705	75.459	370.57	16.64	2.69
23	29-Oct-1991	18:08:09	35.628	75.447	213.53	8.63	2.42
24	29-Oct-1991	19:48:41	35.586	75.430	100.53	4.92	2.93
25	30-Oct-1991	0:15:22	35.490	75.418	266.68	10.73	2.41
26	30-Oct-1991	1:55:23	35.446	75.432	100.02	5.05	3.03
27	30-Oct-1991	6:31:58	35.369	75.429	276.58	8.56	1.86
28	30-Oct-1991	9:53:59	35.295	75.425	202.02	8.24	2.45
29	30-Oct-1991	12:32:59	35.244	75.434	159.00	5.73	2.16
30	30-Oct-1991	14:13:57	35.197	75.420	100.97	5.38	3.20
31	30-Oct-1991	17:55:21	35.106	75.453	221.40	10.55	2.86
32	30-Oct-1991	22:13:10	35.021	75.473	257.82	9.62	2.24
33	30-Oct-1991	23:53:48	34.976	75.509	100.63	5.98	3.57
34	31-Oct-1991	1:33:37	34.945	75.547	99.82	4.89	2.94
35	31-Oct-1991	6:19:10	34.857	75.646	285.55	13.31	2.80
36	31-Oct-1991	7:59:51	34.828	75.689	100.68	5.08	3.03
37	31-Oct-1991	9:42:33	34.791	75.704	102.70	4.34	2.53
38	31-Oct-1991	12:13:35	34.744	75.759	151.03	7.25	2.88
39	31-Oct-1991	13:54:06	34.727	75.795	100.52	3.79	2.26
40	31-Oct-1991	17:45:07	34.697	75.890	231.02	9.30	2.42
41	31-Oct-1991	19:23:25	34.707	75.864	98.30	2.62	1.60
42	01-Nov-1991	1:12:22	34.651	76.040	348.95	17.26	2.97
43	01-Nov-1991	7:50:23	34.610	76.161	398.02	11.97	1.81
44	01-Nov-1991	9:32:12	34.604	76.183	101.82	2.12	1.25
45	01-Nov-1991	11:53:11	34.585	76.204	140.98	2.86	1.22
46	01-Nov-1991	13:32:23	34.580	76.218	99.20	1.40	0.84

Appendix 2. Continued.

POINT NO.	DATE	TIME (GMT)	LAT	LONG	TSLL (m)	DSLL (km)	SPEED (km/h)
47	01-Nov-1991	17:34:26	34.570	76.249	242.05	3.05	0.76
48	01-Nov-1991	20:53:15	34.565	76.320	198.82	6.53	1.97
49	02-Nov-1991	13:13:59	34.575	76.334	980.73	1.70	0.10
50	02-Nov-1991	14:50:31	34.593	76.336	96.53	2.01	1.25
51	02-Nov-1991	17:21:52	34.593	76.354	151.35	1.65	0.65
52	02-Nov-1991	18:59:43	34.624	76.362	97.85	3.52	2.16
53	02-Nov-1991	20:42:22	34.648	76.354	102.65	2.77	1.62
54	02-Nov-1991	22:52:52	34.681	76.363	130.50	3.76	1.73
55	03-Nov-1991	12:50:57	34.722	76.358	838.08	4.58	0.33
56	03-Nov-1991	14:29:05	34.727	76.359	98.13	0.56	0.34
57	03-Nov-1991	18:52:20	34.739	76.382	263.25	2.49	0.57
58	03-Nov-1991	20:30:38	34.748	76.379	98.30	1.04	0.63
59	04-Nov-1991	20:19:10	34.723	76.435	1428.53	5.82	0.24
60	05-Nov-1991	1:30:56	34.709	76.450	311.77	2.07	0.40
61	05-Nov-1991	7:02:57	34.667	76.486	332.02	5.71	1.03
62	05-Nov-1991	8:44:14	34.654	76.492	101.28	1.55	0.92
63	05-Nov-1991	10:23:06	34.630	76.481	98.87	2.85	1.73
64	05-Nov-1991	13:49:11	34.605	76.518	206.08	4.38	1.28
65	05-Nov-1991	18:25:31	34.561	76.577	276.33	7.29	1.58
66	05-Nov-1991	20:07:08	34.558	76.584	101.62	0.72	0.43
67	05-Nov-1991	23:27:48	34.571	76.628	200.67	4.28	1.28
68	06-Nov-1991	1:07:30	34.567	76.630	99.70	0.48	0.29
69	06-Nov-1991	6:52:59	34.556	76.669	345.48	3.78	0.66
70	06-Nov-1991	8:32:03	34.567	76.680	99.07	1.58	0.96
71	06-Nov-1991	10:12:25	34.562	76.696	100.37	1.57	0.94
72	06-Nov-1991	11:48:52	34.580	76.706	96.45	2.20	1.37
73	06-Nov-1991	13:28:26	34.579	76.702	99.57	0.38	0.23
74	06-Nov-1991	15:06:55	34.553	76.663	98.48	4.59	2.80
75	06-Nov-1991	18:14:57	34.567	76.735	188.03	6.78	2.16
76	06-Nov-1991	19:52:31	34.571	76.747	97.57	1.19	0.73
77	06-Nov-1991	23:06:42	34.577	76.783	194.18	3.36	1.04
78	07-Nov-1991	0:46:46	34.581	76.787	100.07	0.58	0.35
79	07-Nov-1991	6:39:12	34.575	76.803	352.43	1.61	0.27
80	07-Nov-1991	10:01:07	34.568	76.823	201.92	1.99	0.59
81	07-Nov-1991	11:27:45	34.583	76.827	86.63	1.71	1.18
82	07-Nov-1991	13:07:28	34.577	76.825	99.72	0.69	0.42
83	07-Nov-1991	14:45:53	34.581	76.848	98.42	2.15	1.31
84	07-Nov-1991	18:03:15	34.575	76.860	197.37	1.29	0.39
85	07-Nov-1991	19:42:31	34.580	76.854	99.27	0.78	0.47
86	07-Nov-1991	22:46:39	34.584	76.892	184.13	3.51	1.14
87	08-Nov-1991	0:26:15	34.588	76.886	99.60	0.71	0.43
88	08-Nov-1991	2:06:33	34.583	76.902	100.30	1.57	0.94
89	08-Nov-1991	12:47:03	34.582	76.935	640.50	3.02	0.28
90	08-Nov-1991	14:26:06	34.576	76.942	99.05	0.93	0.56
91	08-Nov-1991	17:49:13	34.557	76.965	203.12	2.98	0.88
92	08-Nov-1991	19:30:44	34.567	76.955	101.52	1.44	0.85
93	08-Nov-1991	21:11:42	34.548	76.994	100.97	4.15	2.47
94	08-Nov-1991	22:26:06	34.561	77.024	74.40	3.10	2.50
95	09-Nov-1991	0:05:20	34.549	77.051	99.23	2.81	1.70
96	09-Nov-1991	1:47:43	34.565	77.009	102.38	4.24	2.48

Appendix 2. Continued.

POINT NO.	DATE	TIME (GMT)	LAT	LONG	TSLL (m)	DSLL (km)	SPEED (km/h)
97	09-Nov-1991	7:56:38	34.509	77.092	368.92	9.83	1.60
98	09-Nov-1991	9:38:23	34.498	77.096	101.75	1.28	0.75
99	09-Nov-1991	12:26:15	34.485	77.138	167.87	4.11	1.47
100	09-Nov-1991	14:02:50	34.467	77.140	96.58	2.01	1.25
101	09-Nov-1991	19:21:14	34.426	77.188	318.40	6.34	1.19
102	09-Nov-1991	21:02:23	34.416	77.192	101.15	1.17	0.69
103	09-Nov-1991	23:43:57	34.373	77.238	161.57	6.38	2.37
104	10-Nov-1991	1:24:36	34.349	77.278	100.65	4.54	2.71
105	10-Nov-1991	7:45:28	34.272	77.385	380.87	13.03	2.05
106	10-Nov-1991	9:26:38	34.252	77.402	101.17	2.72	1.61
107	10-Nov-1991	12:05:21	34.256	77.434	158.72	2.97	1.12
108	10-Nov-1991	13:45:04	34.250	77.441	99.72	0.93	0.56
109	10-Nov-1991	19:08:30	34.223	77.478	323.43	4.54	0.84
110	10-Nov-1991	20:49:56	34.226	77.472	101.43	0.64	0.38
111	10-Nov-1991	23:22:24	34.231	77.491	152.47	1.83	0.72
112	11-Nov-1991	1:03:58	34.235	77.491	101.57	0.44	0.26
113	11-Nov-1991	7:35:18	34.229	77.479	391.33	1.29	0.20
114	11-Nov-1991	9:14:56	34.228	77.474	99.63	0.47	0.28
115	11-Nov-1991	11:43:39	34.222	77.467	148.72	0.93	0.37
116	11-Nov-1991	13:21:45	34.226	77.477	98.10	1.02	0.62
117	11-Nov-1991	15:03:21	34.236	77.485	101.60	1.33	0.79
118	11-Nov-1991	18:56:32	34.256	77.469	233.18	2.67	0.69
119	11-Nov-1991	20:37:30	34.258	77.452	100.97	1.58	0.94
120	11-Nov-1991	23:01:48	34.254	77.459	144.30	0.78	0.33
121	12-Nov-1991	0:43:15	34.254	77.453	101.45	0.55	0.33
122	12-Nov-1991	13:04:21	34.248	77.482	741.10	2.75	0.22
123	12-Nov-1991	14:42:11	34.242	77.479	97.83	0.72	0.44
124	12-Nov-1991	18:44:35	34.240	77.502	242.40	2.13	0.53
125	12-Nov-1991	20:26:02	34.245	77.510	101.45	0.92	0.55
126	12-Nov-1991	22:41:58	34.244	77.523	135.93	1.20	0.53
127	13-Nov-1991	0:20:46	34.248	77.508	98.80	1.45	0.88
128	13-Nov-1991	2:02:18	34.244	77.535	101.53	2.52	1.49
129	13-Nov-1991	7:08:20	34.236	77.536	306.03	0.89	0.18
130	13-Nov-1991	8:51:15	34.232	77.530	102.92	0.71	0.41
131	13-Nov-1991	12:42:51	34.219	77.541	231.60	1.76	0.46
132	13-Nov-1991	14:21:55	34.212	77.541	99.07	0.78	0.47
133	13-Nov-1991	18:33:34	34.199	77.560	251.65	2.27	0.54

Appendix 3. Data from Kemp's ridley 4938 tracked via satellite in 1991 - 1992. POINT NO. corresponds to numbered points in Figure 13. TIME in Greenwich mean time, LAT = north latitude, LONG = west longitude, TSLL = time since last location in minutes, DSLL = distance since last location in km, SPEED = speed since last location in km/h.

POINT NO.	DATE	TIME (GMT)	LAT	LONG	TSLL (m)	DSLL (km)	SPEED (km/h)
1	28-Oct-1991	19:56:56	36.703	75.848			
2	28-Oct-1991	22:54:25	36.686	75.852	177.48	1.92	0.65
3	29-Oct-1991	12:56:53	36.713	75.698	842.47	14.06	1.00
4	30-Oct-1991	9:50:55	36.736	75.709	1254.03	2.74	0.13
5	31-Oct-1991	9:39:54	36.448	75.604	1428.98	33.36	1.40
6	01-Nov-1991	7:53:13	35.964	75.468	1333.32	55.18	2.48
7	01-Nov-1991	11:52:56	35.885	75.451	239.72	8.92	2.23
8	01-Nov-1991	13:32:14	35.867	75.438	99.30	2.32	1.40
9	02-Nov-1991	0:46:13	35.880	75.352	673.98	7.88	0.70
10	02-Nov-1991	9:14:39	35.819	75.414	508.43	8.79	1.04
11	02-Nov-1991	13:12:11	35.785	75.379	237.53	4.93	1.24
12	03-Nov-1991	11:13:09	35.653	75.302	1320.97	16.24	0.74
13	04-Nov-1991	8:49:49	35.595	75.340	1296.67	7.31	0.34
14	04-Nov-1991	14:09:21	35.570	75.358	319.53	3.22	0.60
15	04-Nov-1991	18:37:29	35.495	75.309	268.13	9.44	2.11
16	05-Nov-1991	7:07:03	35.453	75.316	749.57	4.71	0.38
17	05-Nov-1991	12:12:10	35.424	75.308	305.12	3.30	0.65
18	05-Nov-1991	18:30:49	35.392	75.310	378.65	3.56	0.56
19	05-Nov-1991	20:10:07	35.406	75.285	99.30	2.75	1.66
20	06-Nov-1991	6:53:25	35.360	75.147	643.30	13.52	1.26
21	06-Nov-1991	11:49:01	35.337	75.223	295.60	7.35	1.49
22	06-Nov-1991	13:29:14	35.350	75.240	100.22	2.11	1.27
23	06-Nov-1991	18:17:32	35.370	75.312	288.30	6.90	1.44
24	07-Nov-1991	8:22:00	35.409	75.444	844.47	12.73	0.90
25	07-Nov-1991	11:25:40	35.411	75.431	183.67	1.20	0.39
26	07-Nov-1991	18:04:30	35.405	75.429	398.83	0.69	0.10
27	08-Nov-1991	12:46:18	35.239	75.473	1121.80	18.88	1.01
28	08-Nov-1991	19:32:14	35.093	75.516	405.93	16.70	2.47
29	09-Nov-1991	0:05:13	35.096	75.558	272.98	3.84	0.84
30	09-Nov-1991	14:02:51	35.038	75.791	837.63	22.17	1.59
31	09-Nov-1991	19:21:33	34.953	75.782	318.70	9.49	1.79
32	10-Nov-1991	13:40:55	34.700	76.288	1099.37	54.08	2.95
33	10-Nov-1991	20:52:33	34.720	76.390	431.63	9.59	1.33
34	11-Nov-1991	15:00:17	34.632	76.493	1087.73	13.58	0.75
35	12-Nov-1991	18:45:11	34.437	76.634	1664.90	25.24	0.91
36	12-Nov-1991	20:23:58	34.436	76.649	98.78	1.38	0.84
37	13-Nov-1991	0:19:49	34.451	76.727	235.85	7.34	1.87
38	13-Nov-1991	18:28:14	34.367	77.034	1088.42	29.67	1.64
39	14-Nov-1991	12:20:38	34.373	77.128	1072.40	8.65	0.48
40	14-Nov-1991	18:20:39	34.421	77.182	360.02	7.28	1.21
41	14-Nov-1991	20:04:26	34.440	77.213	103.78	3.54	2.05
42	17-Nov-1991	14:37:44	34.446	77.435	3993.30	20.37	0.31
43	18-Nov-1991	9:32:56	34.278	77.559	1135.20	21.87	1.16
44	18-Nov-1991	12:40:15	34.245	77.619	187.32	6.62	2.12
45	18-Nov-1991	19:15:53	34.211	77.729	395.63	10.80	1.64
46	19-Nov-1991	7:36:08	34.144	77.756	740.25	7.85	0.64

Appendix 3. Continued.

POINT NO.	DATE	TIME (GMT)	LAT	LONG	TSLL (m)	DSLL (km)	SPEED (km/h)
47	19-Nov-1991	12:14:42	34.101	77.819	278.57	7.52	1.62
48	19-Nov-1991	13:58:52	34.084	77.817	104.17	1.90	1.09
49	19-Nov-1991	18:58:39	34.081	77.866	299.78	4.53	0.91
50	19-Nov-1991	23:40:41	34.021	77.881	282.03	6.81	1.45
51	20-Nov-1991	20:28:50	34.022	77.861	1248.15	1.85	0.09
52	21-Nov-1991	7:17:29	33.876	77.930	648.65	17.44	1.61
53	21-Nov-1991	18:41:42	33.805	77.990	684.22	9.64	0.85
54	22-Nov-1991	7:10:34	33.789	78.160	748.87	15.81	1.27
55	22-Nov-1991	14:30:38	33.786	78.185	440.07	2.33	0.32
56	23-Nov-1991	18:13:33	33.734	77.953	1662.92	22.21	0.80
57	24-Nov-1991	12:11:06	33.618	78.292	1077.55	33.92	1.89
58	24-Nov-1991	18:05:56	33.595	78.307	354.83	2.91	0.49
59	24-Nov-1991	21:27:59	33.567	78.384	202.05	7.78	2.31
60	25-Nov-1991	6:31:23	33.611	78.316	543.40	7.98	0.88
61	25-Nov-1991	13:32:31	33.607	78.404	421.13	8.16	1.16
62	25-Nov-1991	21:16:45	33.580	78.436	464.23	4.22	0.55
63	25-Nov-1991	23:09:39	33.562	78.467	112.90	3.50	1.86
64	26-Nov-1991	14:47:12	33.564	78.566	937.55	9.18	0.59
65	26-Nov-1991	22:49:25	33.472	78.562	482.22	10.23	1.27
66	27-Nov-1991	7:50:10	33.414	78.632	540.75	9.15	1.02
67	27-Nov-1991	9:27:34	33.415	78.628	97.40	0.39	0.24
68	27-Nov-1991	12:50:04	33.415	78.659	202.50	2.88	0.85
69	27-Nov-1991	14:30:13	33.413	78.672	100.15	1.23	0.74
70	27-Nov-1991	17:32:14	33.420	78.740	182.02	6.36	2.10
71	27-Nov-1991	19:10:44	33.411	78.737	98.50	1.04	0.63
72	28-Nov-1991	7:40:49	33.361	78.719	750.08	5.80	0.46
73	28-Nov-1991	12:25:56	33.405	78.857	285.12	13.72	2.89
74	28-Nov-1991	14:08:31	33.395	78.827	102.58	3.00	1.75
75	29-Nov-1991	1:22:04	33.394	78.822	673.55	0.48	0.04
76	30-Nov-1991	8:52:38	33.301	79.000	1890.57	19.50	0.62
77	01-Dec-1991	13:03:16	33.183	79.062	1690.63	14.33	0.51
78	02-Dec-1991	12:40:37	33.057	79.214	1417.35	19.92	0.84
79	02-Dec-1991	18:13:24	33.098	79.161	332.78	6.72	1.21
80	03-Dec-1991	12:28:56	32.994	79.144	1095.53	11.67	0.64
81	03-Dec-1991	17:58:02	33.008	79.034	329.10	10.38	1.89
82	03-Dec-1991	23:38:19	32.966	79.047	340.28	4.82	0.85
83	04-Dec-1991	8:13:24	32.744	79.065	515.08	24.74	2.88
84	04-Dec-1991	19:32:56	32.941	79.136	679.53	22.88	2.02
85	05-Dec-1991	13:24:41	32.939	79.115	1071.75	1.97	0.11
86	05-Dec-1991	15:02:10	32.910	79.122	97.48	3.29	2.02
87	05-Dec-1991	17:37:52	32.890	79.124	155.70	2.23	0.86
88	05-Dec-1991	19:16:54	32.871	79.179	99.03	5.55	3.36
89	05-Dec-1991	20:59:21	32.860	79.191	102.45	1.66	0.97
90	06-Dec-1991	13:01:06	32.800	79.303	961.75	12.41	0.77
91	06-Dec-1991	19:04:01	32.786	79.345	362.92	4.22	0.70
92	07-Dec-1991	14:17:48	32.790	79.395	1153.78	4.70	0.24
93	07-Dec-1991	18:58:33	32.754	79.452	280.75	6.67	1.42
94	08-Dec-1991	12:21:05	32.798	79.477	1042.53	5.42	0.31
95	09-Dec-1991	8:44:52	32.724	79.454	1223.78	8.50	0.42
96	09-Dec-1991	18:30:57	32.757	79.532	586.08	8.17	0.84

Appendix 3. Continued.

POINT NO.	DATE	TIME (GMT)	LAT	LONG	TSLL (m)	DSLL (km)	SPEED (km/h)
97	10-Dec-1991	13:22:26	32.704	79.279	1131.48	24.39	1.29
98	11-Dec-1991	18:04:55	32.618	79.665	1722.48	37.38	1.30
99	12-Dec-1991	14:19:42	32.596	79.709	1214.78	4.79	0.24
100	12-Dec-1991	23:53:13	32.582	79.738	573.52	3.13	0.33
101	13-Dec-1991	9:45:43	32.558	79.747	592.50	2.80	0.28
102	13-Dec-1991	19:28:18	32.558	79.778	582.58	2.91	0.30
103	14-Dec-1991	15:15:00	32.631	79.778	1186.70	8.12	0.41
104	15-Dec-1991	18:59:20	32.544	79.814	1664.33	10.24	0.37
105	16-Dec-1991	12:46:25	32.635	79.800	1067.08	10.20	0.57
106	18-Dec-1991	7:00:44	32.544	79.891	2534.32	13.23	0.31
107	20-Dec-1991	6:40:36	32.487	79.837	2859.87	8.11	0.17
108	20-Dec-1991	21:22:52	32.318	80.042	882.27	26.90	1.83
109	20-Dec-1991	22:46:20	32.303	80.041	83.47	1.67	1.20
110	24-Dec-1991	11:46:42	32.262	80.085	5100.37	6.16	0.07
111	25-Dec-1991	0:37:02	32.300	80.062	770.33	4.75	0.37
112	25-Dec-1991	13:05:20	32.247	80.181	748.30	12.65	1.01
113	25-Dec-1991	14:42:53	32.229	80.187	97.55	2.08	1.28
114	25-Dec-1991	18:43:51	32.208	80.193	240.97	2.40	0.60
115	25-Dec-1991	20:24:44	32.170	80.197	100.88	4.24	2.52
116	26-Dec-1991	12:46:10	32.037	80.356	981.43	21.05	1.29
117	26-Dec-1991	14:21:42	32.024	80.381	95.53	2.76	1.74
118	26-Dec-1991	18:30:18	32.008	80.436	248.60	5.48	1.32
119	26-Dec-1991	20:17:03	31.984	80.435	106.75	2.67	1.50
120	27-Dec-1991	12:19:32	31.861	80.520	962.48	15.85	0.99
121	27-Dec-1991	18:21:00	31.829	80.565	361.47	5.54	0.92
122	28-Dec-1991	13:41:31	31.605	80.647	1160.52	26.08	1.35
123	28-Dec-1991	18:09:06	31.573	80.709	267.58	6.87	1.54
124	28-Dec-1991	21:31:53	31.555	80.724	202.78	2.45	0.73
125	29-Dec-1991	1:02:59	31.519	80.701	211.10	4.56	1.30
126	30-Dec-1991	12:58:22	31.527	80.697	2155.38	0.97	0.03
127	31-Dec-1991	2:00:07	31.520	80.684	781.75	1.46	0.11
128	31-Dec-1991	14:16:56	31.487	80.698	736.82	3.90	0.32
129	31-Dec-1991	19:10:19	31.409	80.755	293.38	10.22	2.09
130	31-Dec-1991	20:54:55	31.395	80.768	104.60	1.99	1.14
131	01-Jan-1992	7:38:28	31.255	80.806	1023.00	24.16	1.42
132	01-Jan-1992	13:57:17	31.181	80.812	378.82	8.25	1.31
133	02-Jan-1992	9:03:32	31.069	80.845	1146.25	12.84	0.67
134	02-Jan-1992	13:37:44	30.942	80.865	274.20	14.25	3.12
135	02-Jan-1992	18:50:35	30.861	80.850	312.85	9.12	1.75
136	02-Jan-1992	20:34:37	30.854	80.869	104.03	1.97	1.14
137	05-Jan-1992	18:15:52	30.667	80.840	4181.25	20.97	0.30
138	05-Jan-1992	19:55:27	30.636	80.828	99.58	3.63	2.19
139	06-Jan-1992	18:04:05	30.567	80.802	1328.63	8.06	0.36
140	06-Jan-1992	19:40:44	30.552	80.786	96.65	2.26	1.41
141	08-Jan-1992	21:01:00	30.543	80.772	2960.27	1.67	0.03
142	12-Jan-1992	20:15:14	30.540	80.756	5714.23	1.57	0.02
143	12-Jan-1992	23:03:58	30.523	80.759	168.73	1.91	0.68
144	14-Jan-1992	18:10:57	30.533	80.781	2586.98	2.38	0.06
145	15-Jan-1992	14:05:18	30.519	80.738	1194.35	4.40	0.22
146	18-Jan-1992	20:37:29	30.390	80.873	4712.18	19.32	0.25

Appendix 4. Data from Kemp's ridley 4939 tracked via satellite in 1991 - 1992. POINT NO. corresponds to numbered points in Figure 15. TIME in Greenwich mean time, LAT = north latitude, LONG = west longitude, TSLL = time since last location in minutes, DSSL = distance since last location in km, SPEED = speed since last location in km/h.

POINT NO.	DATE	TIME (GMT)	LAT	LONG	TSLL (m)	DSSL (km)	SPEED (km/h)
1	30-Oct-1991	9:54:06	36.151	75.331			
2	30-Oct-1991	14:13:49	36.081	75.233	259.72	11.75	2.71
3	30-Oct-1991	17:55:54	35.986	75.209	222.08	10.78	2.91
4	30-Oct-1991	23:52:49	35.833	75.134	356.92	18.30	3.08
5	31-Oct-1991	9:44:27	35.586	74.991	591.63	30.35	3.08
6	31-Oct-1991	12:12:49	35.565	75.001	148.37	2.50	1.01
7	31-Oct-1991	13:51:39	35.527	74.961	98.83	5.56	3.38
8	31-Oct-1991	17:44:10	35.474	74.909	232.52	7.54	1.95
9	31-Oct-1991	19:24:41	35.445	74.868	100.52	4.92	2.94
10	01-Nov-1991	1:10:46	35.353	74.857	346.08	10.28	1.78
11	01-Nov-1991	11:52:40	35.236	74.895	641.90	13.46	1.26
12	01-Nov-1991	13:33:56	35.209	74.905	101.27	3.14	1.86
13	01-Nov-1991	17:32:48	35.295	75.002	238.87	13.00	3.27
14	01-Nov-1991	23:10:40	35.202	74.951	337.87	11.33	2.01
15	02-Nov-1991	13:10:33	35.288	75.105	839.88	16.94	1.21
16	02-Nov-1991	18:59:50	35.448	75.064	349.28	18.17	3.12
17	03-Nov-1991	20:32:41	35.480	75.186	1532.85	11.61	0.45
18	03-Nov-1991	22:28:42	35.476	75.192	116.02	0.70	0.36
19	04-Nov-1991	12:30:04	35.381	75.225	841.37	10.98	0.78
20	04-Nov-1991	14:12:39	35.361	75.252	102.58	3.31	1.93
21	04-Nov-1991	20:23:33	35.400	75.268	370.90	4.57	0.74
22	05-Nov-1991	20:05:54	34.995	75.478	1422.35	48.90	2.06
23	06-Nov-1991	6:45:46	35.145	75.691	639.87	25.57	2.40
24	06-Nov-1991	11:51:45	35.006	75.748	305.98	16.30	3.20
25	06-Nov-1991	18:13:15	35.080	75.800	381.50	9.49	1.49
26	06-Nov-1991	19:55:15	35.049	75.829	102.00	4.34	2.55
27	08-Nov-1991	12:44:59	35.041	76.010	2449.73	16.50	0.40
28	09-Nov-1991	6:15:15	34.784	76.137	1050.27	30.83	1.76
29	09-Nov-1991	12:25:52	34.802	76.280	370.62	13.21	2.14
30	09-Nov-1991	14:06:17	34.759	76.295	100.42	4.97	2.97
31	09-Nov-1991	17:40:04	34.659	76.377	213.78	13.41	3.76
32	09-Nov-1991	19:20:47	34.628	76.418	100.72	5.09	3.03
33	09-Nov-1991	21:01:18	34.547	76.455	100.52	9.62	5.74
34	10-Nov-1991	13:44:16	34.489	76.770	1002.97	29.57	1.77
35	11-Nov-1991	18:55:05	34.456	77.183	1750.82	38.04	1.30
36	12-Nov-1991	18:45:21	34.283	77.001	1430.27	25.48	1.07
37	13-Nov-1991	18:35:49	34.384	77.378	1430.47	36.40	1.53
38	13-Nov-1991	20:16:43	34.358	77.409	100.90	4.06	2.41
39	13-Nov-1991	22:21:57	34.326	77.398	125.23	3.70	1.77
40	14-Nov-1991	13:59:37	34.264	77.480	937.67	10.21	0.65
41	14-Nov-1991	18:24:14	34.229	77.541	264.62	6.83	1.55
42	15-Nov-1991	12:00:31	34.220	77.556	1056.28	1.70	0.10
43	15-Nov-1991	13:39:47	34.217	77.568	99.27	1.15	0.70
44	15-Nov-1991	18:07:42	34.220	77.588	267.92	1.87	0.42
45	15-Nov-1991	19:52:22	34.200	77.618	104.67	3.54	2.03

Appendix 4. Continued.

POINT NO.	DATE	TIME (GMT)	LAT	LONG	TSLL (m)	DSLL (km)	SPEED (km/h)
46	16-Nov-1991	1:03:09	34.176	77.627	310.78	2.79	0.54
47	16-Nov-1991	6:32:19	34.169	77.693	329.17	6.12	1.12
48	16-Nov-1991	9:53:22	34.169	77.727	201.05	3.13	0.93
49	16-Nov-1991	13:23:11	34.130	77.698	209.82	5.09	1.46
50	17-Nov-1991	12:58:27	34.039	77.845	1415.27	16.90	0.72
51	17-Nov-1991	14:37:07	33.997	77.847	98.67	4.67	2.84
52	18-Nov-1991	7:57:47	33.705	77.800	1040.67	32.75	1.89
53	18-Nov-1991	19:19:09	33.691	77.846	681.37	4.53	0.40
54	19-Nov-1991	12:18:16	33.591	78.158	1019.12	30.95	1.82
55	19-Nov-1991	19:02:06	33.615	78.168	403.83	2.82	0.42
56	19-Nov-1991	20:41:54	33.626	78.190	99.80	2.38	1.43
57	20-Nov-1991	13:35:19	33.626	78.197	1013.42	0.65	0.04
58	20-Nov-1991	18:51:47	33.669	78.281	316.47	9.13	1.73
59	20-Nov-1991	20:31:08	33.661	78.356	99.35	7.00	4.23
60	21-Nov-1991	8:54:10	33.646	78.394	743.03	3.89	0.31
61	21-Nov-1991	20:20:41	33.680	78.423	686.52	4.64	0.41
62	22-Nov-1991	12:53:34	33.765	78.610	992.88	19.71	1.19
63	24-Nov-1991	18:05:09	33.605	78.868	3191.58	29.77	0.56
64	25-Nov-1991	17:56:59	33.559	78.928	1431.83	7.55	0.32
65	26-Nov-1991	0:49:18	33.509	78.934	412.32	5.59	0.81
66	26-Nov-1991	7:59:46	33.474	78.938	430.47	3.91	0.54
67	26-Nov-1991	22:47:13	33.325	79.033	887.45	18.77	1.27
68	27-Nov-1991	12:53:33	33.221	79.025	846.33	11.59	0.82
69	27-Nov-1991	19:07:27	33.183	79.022	373.90	4.23	0.68
70	27-Nov-1991	22:27:34	33.105	79.081	200.12	10.27	3.08
71	28-Nov-1991	14:08:28	33.009	79.145	940.90	12.23	0.78
72	28-Nov-1991	20:40:29	32.960	79.173	392.02	6.04	0.92
73	29-Nov-1991	13:48:00	32.852	79.261	1027.52	14.55	0.85
74	30-Nov-1991	1:09:01	32.842	79.333	681.02	6.82	0.60
75	30-Nov-1991	11:46:47	32.842	79.414	637.77	7.57	0.71
76	30-Nov-1991	20:16:37	32.801	79.498	509.83	9.08	1.07
77	01-Dec-1991	11:22:46	32.805	79.653	906.15	14.49	0.96
78	01-Dec-1991	18:25:20	32.748	79.552	422.57	11.37	1.61
79	03-Dec-1991	12:23:01	32.743	79.817	2517.68	24.79	0.59
80	03-Dec-1991	17:57:52	32.581	79.705	334.85	20.84	3.73
81	04-Dec-1991	12:02:22	32.730	79.597	1084.50	19.41	1.07
82	04-Dec-1991	13:42:44	32.693	79.554	100.37	5.75	3.44
83	04-Dec-1991	19:30:56	32.618	79.665	348.20	13.32	2.30
84	05-Dec-1991	11:44:27	32.560	79.648	973.52	6.64	0.41
85	05-Dec-1991	19:16:03	32.493	79.635	451.60	7.55	1.00
86	05-Dec-1991	23:01:17	32.455	79.694	225.23	6.96	1.85
87	06-Dec-1991	14:40:59	32.359	79.830	939.70	16.64	1.06
88	06-Dec-1991	19:09:26	32.315	79.805	268.45	5.43	1.21
89	06-Dec-1991	22:38:40	32.259	79.902	209.23	11.04	3.17
90	07-Dec-1991	14:16:35	32.239	79.853	937.92	5.12	0.33
91	07-Dec-1991	18:53:54	32.221	79.813	277.32	4.26	0.92
92	07-Dec-1991	20:34:22	32.225	79.793	100.47	1.93	1.15
93	08-Dec-1991	7:17:02	32.291	80.043	642.67	24.63	2.30
94	08-Dec-1991	18:43:03	32.208	79.772	686.02	27.11	2.37
95	08-Dec-1991	20:22:50	32.202	79.800	99.78	2.72	1.63

Appendix 4. Continued.

POINT NO.	DATE	TIME (GMT)	LAT	LONG	TSLL (m)	DSLL (km)	SPEED (km/h)
96	09-Dec-1991	1:13:52	32.247	79.613	291.03	18.29	3.77
97	09-Dec-1991	11:56:30	32.162	79.845	642.63	23.79	2.22
98	09-Dec-1991	20:10:36	32.143	79.891	494.10	4.82	0.59
99	10-Dec-1991	11:33:57	32.187	79.998	923.35	11.20	0.73
100	10-Dec-1991	14:57:27	32.215	80.011	203.50	3.34	0.99
101	10-Dec-1991	22:55:57	32.186	80.063	478.50	5.86	0.73
102	11-Dec-1991	13:00:17	32.195	80.013	844.33	4.81	0.34
103	12-Dec-1991	23:54:52	31.975	80.165	2094.58	28.34	0.81
104	15-Dec-1991	11:33:47	32.103	80.606	3578.92	43.94	0.74
105	18-Dec-1991	8:43:54	31.762	80.648	4150.12	38.12	0.55
106	19-Dec-1991	6:51:31	31.747	80.683	1327.62	3.71	0.17
107	19-Dec-1991	8:33:25	31.727	80.746	101.90	6.36	3.74
108	20-Dec-1991	14:48:20	31.326	80.865	1814.92	45.99	1.52
109	21-Dec-1991	19:33:35	30.887	81.104	1725.25	53.85	1.87
110	22-Dec-1991	12:26:24	30.904	81.079	1012.82	3.04	0.18
111	22-Dec-1991	20:59:02	30.845	81.023	512.63	8.46	0.99
112	23-Dec-1991	13:51:33	30.869	80.907	1012.52	11.39	0.68
113	23-Dec-1991	20:52:58	30.705	80.911	421.42	18.24	2.60
114	24-Dec-1991	7:36:45	30.742	81.056	643.78	14.46	1.35
115	25-Dec-1991	18:45:39	30.689	81.144	2108.90	10.27	0.29
116	26-Dec-1991	12:45:27	30.426	81.202	1079.80	29.76	1.65
117	26-Dec-1991	20:11:43	30.383	81.243	446.27	6.19	0.83
118	27-Dec-1991	6:55:52	30.257	81.251	644.15	14.03	1.31
119	29-Dec-1991	0:59:23	29.759	81.217	2523.52	55.46	1.32
120	29-Dec-1991	14:57:25	29.631	81.153	838.03	15.52	1.11
121	02-Jan-1992	23:08:55	28.806	80.609	8171.00	136.18	1.00
122	04-Jan-1992	7:08:07	28.524	80.546	1919.20	31.95	1.00

Appendix 5. Data from loggerhead 5783 tracked via satellite in 1986. POINT NO. corresponds to number points in Figure 17. TIME in Greenwich mean time, LAT = north latitude, LONG = west longitude, TSLL = time since last location in minutes, DSLL = distance since last location in km, SPEED = speed since last location in km/h.

POINT NO.	DATE	TIME (GMT)	LAT	LONG	TSLL (m)	DSLL (km)	SPEED (km/h)
1	9-Oct-1986	19:19:24	37.195	76.291			
2	16-Oct-1986	1:26:53	36.489	75.793	9007.48	90.14	0.60
3	18-Oct-1986	19:25:56	35.574	75.425	3959.05	106.97	1.62
4	18-Oct-1986	21: 4: 1	35.529	75.431	98.08	5.03	3.08
5	31-Oct-1986	18:43:59	34.962	75.694	18579.97	67.41	0.22

Appendix 6. Data from loggerhead 5784 tracked via satellite in 1987 - 1988. POINT NO. corresponds to number points in Figure 19. TIME in Greenwich mean time, LAT = north latitude, LONG = west longitude, TSLL = time since last location in minutes, DSLL = distance since last location in km, SPEED = speed since last location in km/h.

POINT NO.	DATE	TIME (GMT)	LAT	LONG	TSLL (m)	DSLL (km)	SPEED (km/h)
1	3-Dec-1987	19:22:26	35.675	74.998			
2	22-Dec-1987	19:16:10	36.523	66.999	27353.73	724.69	1.59
3	27-Dec-1987	18:23: 8	37.505	64.619	7146.97	237.86	2.00
4	27-Dec-1987	20: 3: 0	37.499	64.587	99.87	2.90	1.74
5	10-Jan-1988	19:12:40	36.630	64.332	20109.67	99.23	0.30
6	18-Jan-1988	17:47:15	35.794	64.071	11434.58	95.85	0.50
7	23-Jan-1988	18:32:13	34.944	64.743	7244.97	112.44	0.93
8	31-Jan-1988	13: 4: 8	34.875	65.943	11191.92	109.70	0.59
9	1-Feb-1988	18:34: 0	34.869	66.163	1769.87	20.08	0.68
10	4-Feb-1988	13:14: 0	35.138	66.931	4000.00	76.08	1.14
11	4-Feb-1988	18: 3: 0	35.188	66.987	289.00	7.54	1.56
12	9-Feb-1988	13: 9: 0	35.353	67.828	6906.00	78.53	0.68
13	9-Feb-1988	18:49: 0	35.343	67.916	340.00	8.06	1.42
14	9-Feb-1988	20:29: 0	35.344	67.945	100.00	2.63	1.58
15	10-Feb-1988	14:24: 0	35.401	68.225	1075.00	26.17	1.46
16	10-Feb-1988	18:40: 0	35.374	68.331	256.00	10.07	2.36
17	10-Feb-1988	26:18: 0	35.367	68.369	458.00	3.53	0.46
18	15-Feb-1988	14:16: 0	34.761	69.294	6478.00	107.83	1.00
19	19-Feb-1988	14:29: 0	34.384	69.523	5773.00	46.87	0.49
20	22-Feb-1988	18: 7: 0	33.216	69.980	4538.00	136.55	1.81
21	2-Mar-1988	13:31: 0	31.478	72.341	11244.00	294.15	1.57
22	8-Mar-1988	12:58: 0	31.329	73.248	8607.00	87.67	0.61
23	8-Mar-1988	14:38: 0	31.324	73.279	100.00	3.00	1.80
24	8-Mar-1988	18:46: 0	31.318	73.337	248.00	5.55	1.34
25	8-Mar-1988	20:25: 0	31.321	73.365	99.00	2.68	1.62
26	9-Mar-1988	14:16: 0	31.425	73.726	1071.00	36.17	2.03
27	12-Mar-1988	13:13: 0	31.615	74.429	4257.00	69.91	0.99
28	12-Mar-1988	19:43: 0	31.640	74.494	390.00	6.75	1.04
29	14-Mar-1988	19:21: 0	31.611	74.583	2858.00	9.02	0.19
30	18-Mar-1988	14:21: 0	30.883	74.860	5460.00	85.11	0.94
31	19-Mar-1988	14: 0: 0	31.039	74.955	1419.00	19.57	0.83
32	22-Mar-1988	19:33: 0	31.200	75.612	4653.00	65.06	0.84
33	23-Mar-1988	14:13: 0	31.326	75.761	1120.00	19.92	1.07
34	23-Mar-1988	19:25: 0	31.391	75.821	312.00	9.20	1.77
35	24-Mar-1988	13:49: 0	31.530	75.796	1104.00	15.63	0.85
36	24-Mar-1988	19:14: 0	31.534	75.833	325.00	3.54	0.65
37	25-Mar-1988	13:31: 0	31.717	75.808	1094.00	20.63	1.13
38	25-Mar-1988	19: 2: 0	31.780	75.812	331.00	7.01	1.27
39	26-Mar-1988	18:51: 0	32.044	75.727	1429.00	30.43	1.28
40	26-Mar-1988	20:34: 0	32.067	75.715	103.00	2.80	1.63
41	29-Mar-1988	13:42: 0	32.706	75.051	3908.00	94.52	1.45
42	29-Mar-1988	18:21: 0	32.793	75.121	279.00	11.68	2.51
43	29-Mar-1988	20: 1: 0	32.816	75.142	100.00	3.22	1.93
44	30-Mar-1988	13:23: 0	32.960	75.357	1042.00	25.68	1.48
45	30-Mar-1988	15: 0: 0	32.968	75.379	97.00	2.24	1.38
46	30-Mar-1988	19:50: 0	32.969	75.418	290.00	3.64	0.75

Appendix 6. Continued.

POINT NO.	DATE	TIME (GMT)	LAT	LONG	TSLL (m)	DSLL (km)	SPEED (km/h)
47	31-Mar-1988	14:36: 0	32.784	75.592	1126.00	26.21	1.40
48	31-Mar-1988	19:41: 0	32.634	75.607	305.00	16.74	3.29
49	1-Apr-1988	14:16:29	32.042	75.743	1115.48	67.05	3.61
50	1-Apr-1988	19:28:13	31.953	75.974	311.73	23.93	4.61
51	2-Apr-1988	13:56:50	32.257	76.697	1108.62	76.03	4.11
52	2-Apr-1988	19:18:21	32.358	76.712	321.52	11.32	2.11
53	3-Apr-1988	13:34:50	32.442	76.786	1096.48	11.64	0.64
54	3-Apr-1988	19: 7: 5	32.459	76.679	332.25	10.22	1.85
55	3-Apr-1988	20:46: 1	32.446	76.639	98.93	4.02	2.44
56	4-Apr-1988	20:35:42	32.896	76.355	1429.68	56.65	2.38
57	7-Apr-1988	13:47:12	32.544	75.525	3907.77	86.51	1.33
58	11-Apr-1988	14: 0: 1	31.572	76.662	5772.82	152.18	1.58
59	11-Apr-1988	19:18:45	31.586	76.753	318.73	8.76	1.65
60	17-Apr-1988	19:55:15	33.241	76.695	8676.50	184.08	1.27
61	20-Apr-1988	19:22:52	31.878	75.954	4287.62	166.69	2.33
62	26-Apr-1988	13:34:24	33.317	76.376	8291.53	164.80	1.19
63	27-Apr-1988	14:49: 0	33.766	76.106	1514.60	55.84	2.21
64	27-Apr-1988	19:47:39	33.820	76.039	298.65	8.62	1.73
65	28-Apr-1988	19:36:52	34.333	75.534	1429.22	73.60	3.09
66	1-May-1988	13:19:38	36.245	72.647	3942.77	337.40	5.13
67	2-May-1988	20:34:29	36.313	71.437	1874.85	108.74	3.48
68	8-May-1988	14:11: 0	35.113	72.512	8256.52	164.98	1.20
69	8-May-1988	19:29:15	35.070	72.602	318.25	9.48	1.79
70	9-May-1988	13:50:25	35.009	72.883	1101.17	26.47	1.44
71	9-May-1988	19:18:28	34.959	72.931	328.05	7.07	1.29
72	16-May-1988	14:36:39	33.965	73.227	9798.18	113.79	0.70
73	16-May-1988	19:45:34	33.885	73.020	308.92	21.07	4.09
74	20-May-1988	19: 1: 0	34.465	72.134	5715.43	103.94	1.09
75	25-May-1988	14:41:43	34.737	71.794	6940.72	43.39	0.38
76	27-May-1988	13:57:44	34.338	71.728	2836.02	44.77	0.95
77	27-May-1988	19:22:59	34.261	71.692	325.25	9.18	1.69
78	28-May-1988	13:35:16	34.084	71.516	1092.28	25.48	1.40
79	28-May-1988	19:13:35	34.011	71.402	338.32	13.27	2.35
80	29-May-1988	13:15: 9	33.592	71.426	1081.57	46.64	2.59
81	30-May-1988	14:31:37	33.186	71.024	1170.68	31.49	1.61
82	30-May-1988	18:52:28	33.104	71.045	260.85	9.32	2.14
83	31-May-1988	14:11: 1	32.878	71.118	1158.55	26.03	1.354

Appendix 7. Data from loggerhead 4932 tracked via satellite in 1989 - 1990. POINT NO. corresponds to number points in Figure 21. TIME in Greenwich mean time, LAT = north latitude, LONG = west longitude, TSLL = time since last location in minutes, DSLL = distance since last location in km, SPEED = speed since last location in km/h.

POINT NO.	DATE	TIME (GMT)	LAT	LONG	TSLL (m)	DSLL (km)	SPEED (km/h)
1	10-Nov-1989	5:21:42	36.783	75.766			
2	11-Nov-1989	6:57:45	36.418	75.431	1536.05	50.41	1.97
3	12-Nov-1989	6:46:34	36.296	75.327	1428.82	16.45	0.69
4	12-Nov-1989	14:21:53	36.287	75.301	455.32	2.54	0.33
5	13-Nov-1989	18: 1:33	36.306	75.637	1659.67	30.19	1.09
6	15-Nov-1989	7:46: 5	36.527	75.707	2264.53	25.36	0.67
7	16-Nov-1989	7:36:35	36.119	75.541	1430.50	47.74	2.00
8	17-Nov-1989	14: 5:53	36.069	75.689	1829.30	14.41	0.47
9	17-Nov-1989	17:13: 8	36.039	75.652	187.25	4.71	1.51
10	17-Nov-1989	18:54:31	36.029	75.647	101.38	1.20	0.71
11	18-Nov-1989	7:21: 8	35.832	75.522	746.62	24.62	1.98
12	19-Nov-1989	5:26:15	35.711	75.662	1325.12	18.45	0.84
13	19-Nov-1989	7:10:13	35.709	75.547	103.97	10.39	5.99
14	20-Nov-1989	16:41:51	35.253	75.506	2011.63	50.83	1.52
15	21-Nov-1989	14:20:26	35.204	75.520	1298.58	5.59	0.26
16	22-Nov-1989	18: 1:23	35.136	75.757	1660.95	22.83	0.82
17	25-Nov-1989	7:42:11	34.682	76.323	3700.80	72.19	1.17
18	26-Nov-1989	7:37:15	34.649	76.641	1435.07	29.32	1.23
19	26-Nov-1989	17:17:51	34.567	76.559	580.60	11.81	1.22
20	27-Nov-1989	18:50:53	34.593	76.781	1533.03	20.53	0.80
21	28-Nov-1989	16:58:19	34.585	77.050	1327.43	24.64	1.11
22	29-Nov-1989	5:24:30	34.490	77.357	746.18	30.04	2.42
23	1-Dec-1989	19:48: 4	34.186	77.507	3743.57	36.50	0.58
24	4-Dec-1989	6:11:56	33.896	77.744	3503.87	38.94	0.67
25	4-Dec-1989	7:46:49	33.891	77.728	94.88	1.58	1.00
26	8-Dec-1989	5:28:32	33.385	78.010	5621.72	62.02	0.66
27	8-Dec-1989	7:10:16	33.350	78.051	101.73	5.44	3.21
28	8-Dec-1989	14:34:37	33.257	78.151	444.35	13.90	1.88
29	8-Dec-1989	18:32:46	33.190	78.383	238.15	22.83	5.75
30	10-Dec-1989	19:55:40	33.049	78.836	2962.90	45.01	0.91
31	11-Dec-1989	19:45: 9	32.894	78.995	1429.48	22.74	0.95
32	13-Dec-1989	7:58:20	32.757	79.058	2173.18	16.33	0.45
33	13-Dec-1989	14:22: 7	32.725	79.087	383.78	4.47	0.70
34	13-Dec-1989	17:39:48	32.695	79.076	197.68	3.49	1.06
35	14-Dec-1989	14: 5:19	32.663	78.693	1225.52	36.03	1.76
36	17-Dec-1989	18:33:45	32.407	79.599	4588.43	89.58	1.17
37	19-Dec-1989	18:10:32	32.066	80.762	2856.78	115.78	2.43
38	20-Dec-1989	18: 5:30	31.686	80.401	1434.97	54.29	2.27
39	21-Dec-1989	19:40: 1	31.322	80.403	1534.52	40.47	1.58
40	22-Dec-1989	6:21:47	31.329	80.589	641.77	17.69	1.65
41	22-Dec-1989	8: 0:28	31.319	80.596	98.68	1.30	0.79
42	22-Dec-1989	14:20:21	31.248	80.586	379.88	7.95	1.26
43	22-Dec-1989	17:43:16	31.154	80.732	202.92	17.38	5.14
44	23-Dec-1989	17:33:19	30.754	80.834	1430.05	45.52	1.91
45	24-Dec-1989	6: 0:34	30.459	80.817	747.25	32.84	2.64
46	24-Dec-1989	19: 2:52	30.278	80.824	782.30	20.13	1.54

Appendix 7. Continued.

POINT NO.	DATE	TIME (GMT)	LAT	LONG	TSLI (m)	DSLII (km)	SPEED (km/h)
47	26-Dec-1989	14:34: 9	29.954	80.729	2611.28	37.16	0.85
48	30-Dec-1989	2:19:40	29.952	80.816	5025.52	8.39	0.10
49	30-Dec-1989	6:33:12	29.900	80.824	253.53	5.83	1.38
50	30-Dec-1989	18: 2:19	29.869	80.835	689.12	3.61	0.31
51	31-Dec-1989	6:25:19	29.840	80.809	743.00	4.08	0.33
52	31-Dec-1989	14:22:20	29.828	80.693	477.02	11.27	1.42
53	31-Dec-1989	17:44:51	29.836	80.796	202.52	9.98	2.96
54	31-Dec-1989	19:25:57	29.819	80.854	101.10	5.91	3.50
55	2-Jan-1990	6: 6:24	29.659	80.844	2080.45	17.81	0.51
56	4-Jan-1990	2: 8:14	29.382	80.778	2641.83	31.45	0.71
57	5-Jan-1990	18:31:32	29.347	81.027	2423.30	24.44	0.61
58	6-Jan-1990	18:22:50	29.258	80.802	1431.30	23.96	1.00
59	10-Jan-1990	17:46:29	28.889	80.696	5723.65	42.30	0.44
60	13-Jan-1990	7:34:15	28.553	80.163	3707.77	64.01	1.04
61	17-Jan-1990	14:36:53	28.359	80.372	6182.63	29.71	0.29
62	17-Jan-1990	19:53:33	28.372	80.530	316.67	15.53	2.94
63	18-Jan-1990	14: 7:26	28.114	80.183	1093.88	44.48	2.44
64	19-Jan-1990	19:29:18	28.327	80.383	1761.87	30.74	1.05
65	20-Jan-1990	6:18: 5	28.326	80.412	648.78	2.84	0.26
66	21-Jan-1990	14:39:44	28.286	80.447	1941.65	5.61	0.17
67	23-Jan-1990	18:46: 1	28.293	80.560	3126.28	11.09	0.21
68	26-Jan-1990	19:53:22	28.217	80.536	4387.35	8.77	0.12
69	27-Jan-1990	6:45:12	28.119	80.540	651.83	10.90	1.00
70	31-Jan-1990	7:41:37	27.675	80.087	5816.42	66.47	0.69
71	2-Feb-1990	18:37: 5	27.633	80.166	3535.47	9.08	0.15
72	3-Feb-1990	14:47: 7	27.567	80.130	1210.03	8.15	0.40
73	4-Feb-1990	19:57:23	27.481	80.130	1750.27	9.56	0.33
74	5-Feb-1990	6:49:15	27.168	80.169	651.87	35.01	3.22
75	5-Feb-1990	18: 1:43	27.034	80.044	672.47	19.37	1.73
76	6-Feb-1990	19:37:31	26.429	79.988	1535.80	67.49	2.64
77	8-Feb-1990	14:37:10	26.173	80.069	2579.65	29.58	0.69
78	10-Feb-1990	18:49:32	25.929	80.014	3132.37	27.68	0.53
79	13-Feb-1990	6:56:47	25.608	80.279	3607.25	44.47	0.74
80	13-Feb-1990	14:22:57	25.660	80.247	446.17	6.61	0.89
81	14-Feb-1990	19:48:50	25.676	80.225	1765.88	2.83	0.10
82	16-Feb-1990	8: 6:19	25.489	80.309	2177.48	22.43	0.62
83	17-Feb-1990	2:11:21	25.401	80.292	1085.03	9.93	0.55
84	17-Feb-1990	8: 1:32	25.409	80.238	350.18	5.50	0.94
85	17-Feb-1990	14:31:28	25.377	80.270	389.93	4.79	0.74
86	18-Feb-1990	19:10: 9	25.530	80.093	1718.68	24.60	0.86
87	19-Feb-1990	19: 0:43	25.099	80.693	1430.57	77.03	3.23
88	20-Feb-1990	18:46:53	25.349	80.241	1426.17	53.29	2.24
89	21-Feb-1990	18:36:59	25.230	80.320	1430.10	15.43	0.65
90	2-Mar-1990	18:40:21	25.086	80.335	12963.37	16.08	0.07
91	3-Mar-1990	18:25:42	25.123	80.370	1425.35	5.42	0.23
92	4-Mar-1990	6:53:54	25.162	80.087	748.20	28.82	2.31
93	5-Mar-1990	18: 2:38	25.077	80.399	2108.73	32.80	0.93
94	7-Mar-1990	19:29:41	24.934	80.332	2967.05	17.27	0.35
95	16-Mar-1990	6:25:46	25.034	80.437	12176.08	15.35	0.08
96	18-Mar-1990	7:49:15	24.986	80.522	2963.48	10.09	0.20

Appendix 7. Continued.

POINT NO.	DATE	TIME (GMT)	LAT	LONG	TSLL (m)	DSLL (km)	SPEED (km/h)
97	20-Mar-1990	18:47:58	24.972	80.570	3538.72	5.08	0.09
98	22-Mar-1990	7: 1:35	24.926	80.568	2173.62	5.12	0.14
99	24-Mar-1990	19:39:48	25.020	80.493	3638.22	12.90	0.21
100	26-Mar-1990	19:18:22	25.088	80.425	2858.57	10.20	0.21
101	31-Mar-1990	7: 5:55	24.959	80.525	6467.55	17.53	0.16
102	31-Mar-1990	20: 5:47	25.054	80.456	779.87	12.65	0.97
103	1-Apr-1990	18:14:31	25.038	80.466	1328.73	2.04	0.09
104	3-Apr-1990	19:34:56	25.039	80.486	2960.42	2.02	0.04
105	11-Apr-1990	6:55: 3	25.094	80.610	10760.12	13.91	0.08
106	13-Apr-1990	6:31:28	25.026	80.567	2856.42	8.71	0.18
107	14-Apr-1990	8: 3:44	25.105	80.190	1532.27	38.98	1.53
108	15-Apr-1990	17:28:54	24.972	80.576	2005.17	41.61	1.24
109	17-Apr-1990	18:41:18	25.046	80.520	2952.40	9.98	0.20
110	24-Apr-1990	6:10:46	25.034	80.482	9329.47	4.05	0.03
111	6-May-1990	7:24:41	25.059	80.559	17353.92	8.24	0.03
112	7-May-1990	7:14:17	25.027	80.481	1429.60	8.63	0.36
113	10-May-1990	6:37:13	25.047	80.467	4282.93	2.63	0.04
114	10-May-1990	19:35: 1	25.057	80.434	777.80	3.51	0.27
115	12-May-1990	7:57:57	25.053	80.474	2182.93	4.05	0.11
116	17-May-1990	18:23: 7	25.007	80.473	7825.17	5.12	0.04
117	20-May-1990	8: 7: 5	24.849	80.399	3703.97	19.09	0.31
118	21-May-1990	14:22:37	25.027	80.526	1815.53	23.57	0.78
119	28-May-1990	6:42: 7	25.011	80.509	9619.50	2.47	0.02

Appendix 8. Data from loggerhead 4933 tracked via satellite in 1989 - 1990. POINT NO. corresponds to number points in Figure 23. TIME in Greenwich mean time, LAT = north latitude, LONG = west longitude, TSLL = time since last location in minutes, DSLL = distance since last location in km, SPEED = speed since last location in km/h.

POINT NO.	DATE	TIME (GMT)	LAT	LONG	TSLL (m)	DSLL (km)	SPEED (km/h)
1	09-Nov-1989	20:19:59	36.847	75.703			
2	10-Nov-1989	11:45:56	36.653	75.656	925.95	21.97	1.42
3	11-Nov-1989	8:34:27	36.778	75.445	1248.52	23.39	1.12
4	11-Nov-1989	22:44:17	36.675	75.801	849.83	33.73	2.38
5	13-Nov-1989	1:43:56	36.678	75.386	1619.65	37.02	1.37
6	14-Nov-1989	15:14:59	36.757	75.798	2251.05	37.76	1.01
7	15-Nov-1989	13:17:51	37.048	75.094	1322.87	70.47	3.20
8	16-Nov-1989	19:06:29	36.654	75.895	1788.63	83.66	2.81
9	19-Nov-1989	1:04:21	36.246	75.721	3237.87	47.96	0.89
10	20-Nov-1989	0:39:37	35.913	75.531	1415.27	40.77	1.73
11	22-Nov-1989	17:57:38	35.290	74.000	3918.02	154.79	2.37
12	23-Nov-1989	23:08:18	35.312	74.762	1750.67	69.20	2.37
13	25-Nov-1989	7:48:46	35.080	75.935	1960.47	109.67	3.36
14	25-Nov-1989	14:29:30	35.012	75.832	400.73	12.05	1.80
15	27-Nov-1989	17:09:11	34.621	76.503	3039.68	75.12	1.48
16	27-Nov-1989	18:50:16	34.599	76.501	101.08	2.45	1.46
17	28-Nov-1989	0:57:44	34.549	76.760	367.47	24.36	3.98
18	02-Dec-1989	13:34:13	34.363	77.066	6516.48	34.86	0.32
19	03-Dec-1989	19:31:42	33.831	77.132	1797.48	59.46	1.98
20	04-Dec-1989	7:54:37	34.086	77.785	742.92	66.57	5.38
21	07-Dec-1989	13:21:21	33.641	77.983	4646.73	52.74	0.68
22	07-Dec-1989	18:40:57	33.643	78.038	319.60	5.10	0.96
23	08-Dec-1989	0:36:06	33.651	78.069	355.15	3.00	0.51
24	08-Dec-1989	11:15:35	33.528	78.303	639.48	25.63	2.40
25	08-Dec-1989	18:32:48	33.574	78.472	437.22	16.48	2.26
26	10-Dec-1989	18:08:22	33.365	78.999	2855.57	54.13	1.14
27	12-Dec-1989	13:09:15	32.983	78.682	2580.88	51.71	1.20
28	14-Dec-1989	6:08:27	32.793	79.554	2459.20	84.13	2.05
29	14-Dec-1989	14:01:24	32.784	79.440	472.95	10.70	1.36
30	17-Dec-1989	7:16:41	32.379	80.001	3915.28	69.22	1.06
31	17-Dec-1989	14:31:02	32.313	79.992	434.35	7.39	1.02
32	17-Dec-1989	16:57:56	32.301	80.010	146.90	2.16	0.88
33	17-Dec-1989	18:40:18	32.246	80.057	102.37	7.54	4.42
34	18-Dec-1989	14:07:12	32.199	80.297	1166.90	23.18	1.19
35	19-Dec-1989	6:55:35	32.122	80.522	1008.38	22.85	1.36
36	19-Dec-1989	8:30:49	32.108	80.506	95.23	2.17	1.37
37	19-Dec-1989	13:52:17	32.110	80.381	321.47	11.78	2.20
38	20-Dec-1989	13:27:19	31.883	80.734	1415.03	41.78	1.77
39	20-Dec-1989	19:43:39	31.868	80.894	376.33	15.20	2.42
40	21-Dec-1989	14:45:54	31.692	80.866	1142.25	19.75	1.04
41	23-Dec-1989	19:18:54	31.063	81.142	3153.00	74.68	1.42
42	23-Dec-1989	20:56:15	31.107	81.099	97.35	6.38	3.93
43	24-Dec-1989	13:36:29	30.882	81.208	1000.23	27.09	1.62
44	24-Dec-1989	20:45:35	30.829	81.198	429.10	5.97	0.83
45	26-Dec-1989	8:59:43	30.618	81.188	2174.13	23.48	0.65
46	27-Dec-1989	1:41:54	30.553	81.316	1002.18	14.23	0.85

Appendix 8. Continued.

POINT NO.	DATE	TIME (GMT)	LAT	LONG	TSLL (m)	DSLL (km)	SPEED (km/h)
47	27-Dec-1989	12:26:57	30.616	81.202	645.05	12.97	1.21
48	28-Dec-1989	12:04:20	30.578	81.170	1417.38	5.22	0.22
49	28-Dec-1989	23:23:34	30.515	81.234	679.23	9.31	0.82
50	29-Dec-1989	19:46:56	30.494	81.103	1223.37	12.77	0.63
51	31-Dec-1989	12:38:47	30.319	81.125	2451.85	19.57	0.48
52	04-Jan-1990	14:30:00	29.440	81.062	5871.22	97.91	1.00
53	06-Jan-1990	20:01:23	29.329	81.015	3211.38	13.15	0.25
54	08-Jan-1990	19:45:16	29.257	81.013	2863.88	8.01	0.17
55	11-Jan-1990	19:08:31	29.694	79.987	4283.25	110.57	1.55
56	14-Jan-1990	17:01:07	28.963	80.792	4192.60	112.68	1.61
57	14-Jan-1990	23:33:30	28.840	80.612	392.38	22.23	3.40
58	18-Jan-1990	14:13:36	28.606	80.530	5200.10	27.22	0.31
59	20-Jan-1990	1:01:35	28.603	80.644	2087.98	11.13	0.32
60	21-Jan-1990	19:09:23	28.508	79.361	2527.80	125.76	2.99
61	26-Jan-1990	0:22:23	28.923	80.296	6073.00	102.19	1.01
62	30-Jan-1990	14:37:12	28.624	80.571	6614.82	42.70	0.39
63	01-Feb-1990	12:12:05	28.553	80.217	2734.88	35.46	0.78
64	01-Feb-1990	20:34:14	28.586	80.006	502.15	20.93	2.50
65	02-Feb-1990	16:58:26	28.762	80.627	1224.20	63.67	3.12
66	02-Feb-1990	20:20:20	28.707	80.536	201.90	10.78	3.20
67	03-Feb-1990	22:44:38	28.731	80.572	1584.30	4.41	0.17
68	05-Feb-1990	19:48:09	28.620	80.455	2703.52	16.81	0.37
69	06-Feb-1990	11:58:23	28.497	80.330	970.23	18.33	1.13
70	08-Feb-1990	9:37:24	28.410	80.147	2739.02	20.34	0.45
71	10-Feb-1990	20:35:10	28.650	80.451	3537.77	39.93	0.68
72	11-Feb-1990	13:28:48	28.601	80.566	1013.63	12.48	0.74
73	12-Feb-1990	11:27:13	28.600	80.860	1318.42	28.70	1.31
74	14-Feb-1990	18:05:23	28.740	80.606	3278.17	29.26	0.54
75	15-Feb-1990	19:41:02	28.643	80.535	1535.65	12.82	0.50
76	19-Feb-1990	13:52:43	28.867	80.193	5411.68	41.62	0.46
77	21-Feb-1990	0:41:48	28.854	80.243	2089.08	5.08	0.15
78	21-Feb-1990	20:21:14	28.743	80.319	1179.43	14.39	0.73
79	24-Feb-1990	17:59:54	29.131	80.799	4178.67	63.58	0.91
80	27-Feb-1990	1:47:42	28.818	80.487	3347.80	46.18	0.83
81	28-Feb-1990	17:17:54	28.948	80.467	2370.20	14.58	0.37
82	28-Feb-1990	20:41:59	28.894	80.560	204.08	10.86	3.19
83	07-Mar-1990	19:29:58	28.634	80.497	10007.98	29.55	0.18
84	15-Mar-1990	13:03:40	28.687	80.658	11133.70	16.78	0.09
85	20-Mar-1990	14:31:52	29.439	80.948	7288.20	88.23	0.73
86	29-Mar-1990	20:32:18	30.769	81.336	13320.43	152.50	0.69
87	30-Mar-1990	8:58:57	30.786	81.250	746.65	8.43	0.68
88	30-Mar-1990	14:03:48	30.878	81.214	304.85	10.79	2.12
89	31-Mar-1990	13:40:50	30.715	81.157	1417.03	18.92	0.80
90	01-Apr-1990	20:05:48	31.279	80.756	1824.97	73.44	2.41
91	03-Apr-1990	8:16:42	31.639	81.037	2170.90	48.09	1.33
92	03-Apr-1990	12:30:15	31.637	80.989	253.55	4.55	1.08
93	03-Apr-1990	19:41:40	31.731	81.085	431.42	13.85	1.93
94	04-Apr-1990	8:02:13	31.745	81.016	740.55	6.71	0.54
95	05-Apr-1990	7:54:04	31.894	80.847	1431.85	23.01	0.96
96	05-Apr-1990	19:11:23	31.989	80.806	677.32	11.25	1.00

Appendix 8. Continued.

POINT NO.	DATE	TIME (GMT)	LAT	LONG	TSLL (m)	DSLL (km)	SPEED (km/h)
97	07-Apr-1990	0:24:48	31.716	81.069	1753.42	39.22	1.34
98	07-Apr-1990	19:00:40	31.559	81.102	1115.87	17.73	0.95
99	09-Apr-1990	23:11:12	32.509	80.240	3130.53	133.26	2.55
100	12-Apr-1990	1:49:25	32.640	79.371	3038.22	82.73	1.63
101	12-Apr-1990	6:36:58	32.734	79.531	287.55	18.26	3.81
102	14-Apr-1990	8:00:46	33.023	78.336	2963.80	116.14	2.35
103	17-Apr-1990	9:07:33	33.172	78.710	4386.78	38.58	0.53
104	18-Apr-1990	7:12:57	33.426	78.741	1325.40	28.39	1.28
105	19-Apr-1990	18:28:42	33.546	78.750	2115.75	13.37	0.38
106	23-Apr-1990	22:49:43	33.849	77.808	6021.02	93.44	0.93
107	28-Apr-1990	8:42:07	33.647	78.583	6352.40	75.10	0.71
108	28-Apr-1990	20:13:14	33.769	78.383	691.12	22.94	1.99
109	02-May-1990	17:51:41	33.880	78.081	5618.45	30.51	0.33
110	03-May-1990	17:34:52	34.417	77.459	1423.18	82.71	3.49
111	05-May-1990	13:41:58	34.599	77.050	2647.10	42.59	0.97
112	07-May-1990	22:39:19	34.851	76.196	3417.35	82.93	1.46
113	08-May-1990	8:43:00	34.989	76.074	603.68	18.95	1.88
114	08-May-1990	18:21:17	35.009	76.051	578.28	3.05	0.32
115	08-May-1990	23:48:57	35.075	75.933	327.67	13.01	2.38
116	09-May-1990	1:31:33	35.061	75.938	102.60	1.62	0.95
117	10-May-1990	19:35:41	35.489	75.200	2524.13	82.18	1.95
118	17-May-1990	7:00:05	36.989	76.116	9324.40	185.90	1.20
119	17-May-1990	20:04:51	37.276	76.314	784.77	36.42	2.78
120	18-May-1990	6:48:06	37.221	76.218	643.25	10.47	0.98
121	18-May-1990	13:48:57	37.360	76.200	420.85	15.54	2.21
122	19-May-1990	19:47:15	37.412	76.148	1798.30	7.38	0.25
123	20-May-1990	22:40:20	37.598	76.187	1613.08	20.96	0.78
124	22-May-1990	19:07:07	37.702	76.250	2666.78	12.82	0.29
125	23-May-1990	5:52:12	37.625	76.144	645.08	12.66	1.18
126	23-May-1990	17:17:38	37.641	76.127	685.43	2.32	0.20
127	25-May-1990	20:19:25	37.166	76.172	3061.78	52.96	1.04
128	29-May-1990	6:26:54	37.973	76.098	4927.48	89.96	1.10
129	29-May-1990	14:34:58	38.084	76.268	488.07	19.34	2.38
130	29-May-1990	19:32:19	38.062	76.134	297.35	11.98	2.42
131	31-May-1990	17:31:50	37.960	76.341	2759.52	21.39	0.47
132	03-Jun-1990	8:51:53	37.896	76.203	3800.05	14.04	0.22
133	03-Jun-1990	12:41:07	37.941	76.256	229.23	6.83	1.79
134	04-Jun-1990	13:55:19	37.976	76.342	1514.20	8.49	0.34
135	10-Jun-1990	1:02:43	37.585	76.072	7867.40	49.53	0.38
136	11-Jun-1990	14:38:41	37.877	76.222	2255.97	35.04	0.93
137	12-Jun-1990	0:18:32	37.956	76.078	579.85	15.39	1.59
138	12-Jun-1990	1:58:52	37.950	76.063	100.33	1.47	0.88
139	12-Jun-1990	7:17:38	37.930	76.301	318.77	20.99	3.95
140	12-Jun-1990	14:15:59	37.910	76.142	418.35	14.13	2.03
141	13-Jun-1990	7:07:58	38.050	76.345	1011.98	23.64	1.40
142	13-Jun-1990	8:47:12	38.011	76.279	99.23	7.23	4.37
143	14-Jun-1990	1:09:25	38.178	76.320	982.22	18.91	1.16
144	14-Jun-1990	13:31:58	38.113	75.914	742.55	36.24	2.93
145	14-Jun-1990	20:04:42	38.158	76.203	392.73	25.77	3.94
146	15-Jun-1990	18:06:58	38.141	76.263	1322.27	5.58	0.25

Appendix 8. Continued.

POINT NO.	DATE	TIME (GMT)	LAT	LONG	TSLL (m)	DSLL (km)	SPEED (km/h)
147	16-Jun-1990	0:24:59	38.147	76.290	378.02	2.45	0.39
148	22-Jun-1990	8:53:20	38.107	76.437	9148.35	13.61	0.09
149	22-Jun-1990	20:14:28	37.968	76.196	681.13	26.16	2.30

Appendix 9. Data from loggerhead 4934 tracked via satellite in 1991 - 1992. POINT NO. corresponds to number points in Figure 25. TIME in Greenwich mean time, LAT = north latitude, LONG = west longitude, TSLL = time since last location in minutes, DSLL = distance since last location in km, SPEED = speed since last location in km/h.

POINT NO.	DATE	TIME (GMT)	LAT	LONG	TSLL (m)	DSLL (km)	SPEED (km/h)
1	24-Oct-1991	9:26:20	36.944	75.379			
2	24-Oct-1991	20:49:59	36.828	75.542	683.65	19.40	1.70
3	25-Oct-1991	9:10:43	36.510	75.764	740.73	40.52	3.28
4	25-Oct-1991	14:21:27	36.436	75.442	310.73	29.95	5.78
5	25-Oct-1991	20:36:59	36.496	75.490	375.53	7.93	1.27
6	26-Oct-1991	9: 1: 5	36.238	75.518	744.10	28.79	2.32
7	26-Oct-1991	12:16: 6	36.210	75.612	195.02	8.99	2.77
8	26-Oct-1991	18:45: 9	36.087	75.547	389.05	14.87	2.29
9	26-Oct-1991	23:34: 5	36.063	75.368	288.93	16.31	3.39
10	27-Oct-1991	7: 9:42	35.932	75.486	455.62	18.02	2.37
11	27-Oct-1991	11:55:47	35.829	75.381	286.08	14.85	3.12
12	27-Oct-1991	13:36:40	35.807	75.365	100.88	2.84	1.69
13	29-Oct-1991	0:36:43	35.127	75.287	2100.05	75.93	2.17
14	29-Oct-1991	6:41:40	35.127	75.595	364.95	28.01	4.61
15	29-Oct-1991	19:46:40	35.008	75.727	785.00	17.87	1.37
16	30-Oct-1991	0:12:58	34.938	75.979	266.30	24.25	5.46
17	30-Oct-1991	12:35:19	34.699	76.170	742.35	31.78	2.57
18	30-Oct-1991	14:11:36	34.652	76.198	96.28	5.82	3.63
19	30-Oct-1991	17:52: 9	34.589	76.139	220.55	8.84	2.41
20	31-Oct-1991	12: 9:32	34.268	76.268	1097.38	37.60	2.06
21	1-Nov-1991	7:53:37	34.115	76.753	1184.08	47.75	2.42
22	1-Nov-1991	11:50:27	34.039	76.764	236.83	8.51	2.16
23	1-Nov-1991	17:34:49	33.984	76.655	344.37	11.76	2.05
24	2-Nov-1991	17:21:19	33.898	76.682	1426.50	9.88	0.42
25	3-Nov-1991	2: 8:39	34.114	76.982	527.33	36.63	4.17
26	5-Nov-1991	13:54:19	34.050	76.704	3585.67	26.58	0.44
27	6-Nov-1991	11:46:30	33.733	76.845	1312.18	37.57	1.72
28	6-Nov-1991	19:56:58	33.790	76.809	490.47	7.16	0.88
29	9-Nov-1991	12:20:43	33.817	76.897	3863.75	8.67	0.13
30	10-Nov-1991	1:27:16	33.695	77.011	786.55	17.18	1.31
31	10-Nov-1991	12: 8:23	33.814	77.145	641.12	18.13	1.70
32	11-Nov-1991	15: 4:50	33.705	76.886	1616.45	26.84	1.00
33	12-Nov-1991	18:51:22	33.868	76.847	1666.53	18.48	0.67
34	14-Nov-1991	18:20:52	33.611	77.129	2849.50	38.68	0.81
35	15-Nov-1991	8:25: 8	33.791	77.360	844.27	29.28	2.08
36	20-Nov-1991	11:51:49	33.594	76.716	7406.68	63.48	0.51
37	21-Nov-1991	18:38:40	33.614	76.897	1846.85	16.91	0.55
38	25-Nov-1991	17:50:26	33.504	77.327	5711.77	41.68	0.44
39	28-Nov-1991	12:33:33	33.518	76.511	4003.12	75.68	1.13
40	29-Nov-1991	13:51: 1	33.750	76.896	1517.47	44.00	1.74
41	30-Nov-1991	11:49:12	33.741	77.244	1318.18	32.19	1.47
42	4-Dec-1991	17:49:32	33.629	76.926	6120.33	31.95	0.31
43	6-Dec-1991	19: 4: 1	33.783	76.984	2954.48	17.94	0.36
44	6-Dec-1991	22:36:29	33.817	77.074	212.47	9.14	2.58
45	8-Dec-1991	18:47:38	33.816	76.910	2651.15	15.15	0.34
46	9-Dec-1991	10:29:45	33.760	76.760	942.12	15.20	0.97

Appendix 9. Continued.

POINT NO.	DATE	TIME (GMT)	LAT	LONG	TSLL (m)	DSLL (km)	SPEED (km/h)
47	11-Dec-1991	18:10:16	33.725	77.016	3340.52	23.99	0.43
48	12-Dec-1991	12:31:10	33.566	77.245	1100.90	27.60	1.50
49	13-Dec-1991	17:46:13	33.766	77.053	1755.05	28.46	0.97
50	13-Dec-1991	21: 8: 6	33.691	76.947	201.88	12.87	3.82
51	14-Dec-1991	19: 9: 0	33.709	77.187	1320.90	22.29	1.01
52	14-Dec-1991	20:49:33	33.753	77.225	100.55	6.02	3.59
53	15-Dec-1991	0:49:51	33.784	77.079	240.30	13.93	3.48
54	16-Dec-1991	12:54:10	33.810	77.092	2164.32	3.13	0.09
55	19-Dec-1991	8:30:33	33.788	77.176	4056.38	8.14	0.12
56	22-Dec-1991	7:53: 0	33.761	76.813	4282.45	33.69	0.47
57	27-Dec-1991	12:22:53	33.807	77.031	7469.88	20.79	0.17
58	28-Dec-1991	21:31:14	33.757	76.697	1988.35	31.37	0.95
59	30-Dec-1991	0:31:15	34.186	76.950	1620.02	53.10	1.97
60	30-Dec-1991	22:33:12	33.805	77.093	1321.95	44.36	2.01
61	31-Dec-1991	17:32: 3	33.746	77.052	1138.85	7.58	0.40
62	1-Jan-1992	7:39:21	33.806	77.036	3962.00	10.89	0.17
63	3-Jan-1992	11:34:55	33.843	77.036	3115.57	4.11	0.08
64	3-Jan-1992	14:50:34	33.793	76.990	195.65	7.00	2.15
65	3-Jan-1992	18:37: 7	33.776	76.995	226.55	1.95	0.52
66	4-Jan-1992	0:34:24	33.735	76.948	357.28	6.30	1.06
67	5-Jan-1992	19:51:22	33.803	76.910	2596.97	8.34	0.19
68	7-Jan-1992	13:30: 5	33.729	76.894	2498.72	8.36	0.20
69	7-Jan-1992	17:54:32	33.729	76.817	264.45	7.12	1.62
70	10-Jan-1992	20:42:17	33.697	76.641	4487.75	16.67	0.22
71	14-Jan-1992	14:26:19	33.739	76.921	5384.03	26.32	0.29
72	14-Jan-1992	18: 9:40	33.792	76.985	223.35	8.35	2.24
73	20-Jan-1992	7:12:55	33.756	76.546	7983.25	40.78	0.31
74	22-Jan-1992	19:52:16	33.733	76.948	3639.35	37.26	0.61
75	23-Jan-1992	19:47:58	33.812	76.620	1435.70	31.57	1.32
76	24-Jan-1992	12:32:17	33.739	76.785	1004.32	17.28	1.03
77	27-Jan-1992	13:11:38	33.788	76.799	4359.35	5.60	0.08
78	2-Feb-1992	12:44:16	33.786	76.915	8612.63	10.72	0.07
79	2-Feb-1992	14:21:41	33.744	76.929	97.42	4.85	2.98
80	4-Feb-1992	20:49:41	33.510	76.805	3268.00	28.44	0.52
81	7-Feb-1992	8:47: 3	33.507	77.069	3597.37	24.48	0.41
82	7-Feb-1992	12:40: 3	33.469	77.163	233.00	9.69	2.49
83	7-Feb-1992	20:10:42	33.467	77.115	450.65	4.46	0.59
84	12-Feb-1992	22:12:10	33.600	77.183	7321.47	16.07	0.13
85	17-Feb-1992	14:13:22	33.684	76.542	6721.20	60.07	0.54
86	19-Feb-1992	17:47: 1	33.612	77.231	3093.65	64.28	1.25
87	20-Feb-1992	19:21:18	33.557	77.157	1534.28	9.19	0.36
88	23-Feb-1992	12: 4: 4	33.554	77.244	3882.77	8.07	0.12
89	24-Feb-1992	18:24:58	33.568	77.213	1820.90	3.27	0.11
90	27-Feb-1992	19:33: 0	33.471	77.301	4388.03	13.52	0.18
91	1-Mar-1992	9:12: 5	33.979	77.104	2259.08	59.34	1.58
92	2-Mar-1992	7:27:43	33.893	77.014	1335.63	12.66	0.57
93	2-Mar-1992	14: 9:44	33.711	76.703	402.02	35.15	5.25
94	3-Mar-1992	1:33: 7	33.897	76.735	683.38	20.89	1.83
95	4-Mar-1992	10:21:12	33.987	76.642	1968.08	13.18	0.40
96	5-Mar-1992	22:46:33	34.263	76.356	2185.35	40.43	1.11

Appendix 9. Continued.

POINT NO.	DATE	TIME (GMT)	LAT	LONG	TSLL (m)	DSLL (km)	SPEED (km/h)
97	6-Mar-1992	11: 8:16	34.484	76.202	741.72	28.35	2.29
98	7-Mar-1992	14: 4:43	34.920	75.954	1616.45	53.51	1.99
99	8-Mar-1992	9:29:32	35.081	75.742	1164.82	26.33	1.36
100	9-Mar-1992	23: 9:18	34.487	75.695	2259.77	66.18	1.76
101	11-Mar-1992	2: 4:26	35.156	74.968	1615.13	99.68	3.70
102	12-Mar-1992	0: 6: 8	35.354	74.737	1321.70	30.41	1.38
103	17-Mar-1992	12:19:31	35.309	75.302	7933.38	51.50	0.39
104	20-Mar-1992	22:33:13	34.956	75.638	4933.70	49.74	0.60
105	21-Mar-1992	6:58:20	34.879	75.802	505.12	17.23	2.05
106	21-Mar-1992	10:19:40	34.847	75.826	201.33	4.18	1.24
107	21-Mar-1992	12:32: 6	34.794	75.893	132.43	8.49	3.85
108	22-Mar-1992	1:24:58	34.492	76.225	772.87	45.28	3.51
109	23-Mar-1992	6:33:49	34.117	76.229	1748.85	41.69	1.43
110	23-Mar-1992	9:59:59	34.101	76.079	206.17	13.92	4.05
111	24-Mar-1992	0:43:28	34.076	76.338	883.48	24.01	1.63
112	24-Mar-1992	13: 6:39	33.943	76.323	743.18	14.85	1.20
113	24-Mar-1992	21: 8:44	33.835	76.558	482.08	24.80	3.09
114	25-Mar-1992	0:31: 8	33.751	76.476	202.40	12.03	3.57
115	26-Mar-1992	12:30:57	33.623	76.594	2159.82	17.94	0.50
116	26-Mar-1992	20:40: 5	33.725	76.799	489.13	22.10	2.71
117	28-Mar-1992	8:59:30	33.730	76.928	2179.42	11.94	0.33
118	29-Mar-1992	0:36:44	33.999	76.560	937.23	45.27	2.90
119	31-Mar-1992	0: 4:16	33.150	77.324	2847.53	117.98	2.49
120	31-Mar-1992	12:17:40	33.537	77.031	733.40	50.91	4.17
121	1-Apr-1992	9:47: 4	33.572	77.101	1289.40	7.56	0.35
122	2-Apr-1992	1: 0:37	33.465	77.160	913.55	13.09	0.86
123	3-Apr-1992	19:12:40	34.177	76.579	2532.05	95.64	2.27
124	5-Apr-1992	13:54:40	33.665	76.976	2562.00	67.69	1.59
125	6-Apr-1992	13:36:31	33.715	76.901	1421.85	8.89	0.38
126	6-Apr-1992	23:10:13	33.792	77.009	573.70	13.15	1.38
127	7-Apr-1992	18:23:50	33.627	77.122	1153.62	21.11	1.10
128	8-Apr-1992	18: 8:44	33.594	77.006	1424.90	11.35	0.48
129	9-Apr-1992	1:49:11	33.645	76.843	460.45	16.12	2.10
130	10-Apr-1992	19:25:48	33.979	76.812	2496.62	37.24	0.90
131	12-Apr-1992	20:43:10	34.521	76.233	2957.37	80.40	1.63
132	17-Apr-1992	8:18:56	35.494	75.270	6455.77	139.27	1.29
133	18-Apr-1992	17:52:15	35.827	75.208	2013.32	37.44	1.12
134	20-Apr-1992	20:49:22	35.559	75.329	3057.12	31.74	0.62
135	21-Apr-1992	22:53: 9	35.507	75.248	1563.78	9.34	0.36
136	23-Apr-1992	23:51:34	35.431	75.321	2938.42	10.73	0.22
137	29-Apr-1992	23:25:20	35.273	75.348	8613.77	17.74	0.12
138	2-May-1992	18:27:36	35.303	75.479	4022.27	12.35	0.18
139	8-May-1992	12: 9:57	35.847	73.458	8262.35	192.54	1.40
140	19-May-1992	1: 1:16	35.675	75.221	15171.32	160.24	0.63
141	23-May-1992	7:49:30	35.139	75.493	6168.23	64.49	0.63
142	26-May-1992	10:34:30	36.012	75.543	4485.00	97.16	1.30
143	30-May-1992	0:31:21	36.084	75.169	5156.85	34.57	0.40
144	31-May-1992	19:18:23	36.717	75.815	2567.03	91.08	2.13
145	1-Jun-1992	1:26:39	36.776	75.798	368.27	6.73	1.10
146	10-Jun-1992	20:40:40	37.315	76.236	14114.02	71.43	0.30

Appendix 9. Continued.

POINT NO.	DATE	TIME (GMT)	LAT	LONG	TSLL (m)	DSLL (km)	SPEED (km/h)
147	10-Jun-1992	23:33:21	37.361	76.242	172.68	5.14	1.79
148	11-Jun-1992	1:13:21	37.384	76.229	100.00	2.80	1.68
149	11-Jun-1992	7:22:42	37.369	76.239	369.35	1.89	0.31
150	11-Jun-1992	10:44:23	37.415	76.224	201.68	5.28	1.57
151	11-Jun-1992	11:51:23	37.390	76.240	67.00	3.12	2.79
152	11-Jun-1992	13:32: 4	37.399	76.245	100.68	1.09	0.65
153	11-Jun-1992	20:28:46	37.334	76.260	416.70	7.35	1.06
154	11-Jun-1992	23:11:26	37.336	76.267	162.67	0.66	0.24
155	12-Jun-1992	0:53:47	37.336	76.281	102.35	1.24	0.73
156	12-Jun-1992	10:30:49	37.351	76.177	577.03	9.34	0.97
157	12-Jun-1992	18:36:31	37.343	76.317	485.70	12.41	1.53
158	12-Jun-1992	20:17:51	37.337	76.269	101.33	4.30	2.54
159	12-Jun-1992	22:50:32	37.335	76.280	152.68	1.00	0.39
160	13-Jun-1992	0:30:52	37.336	76.272	100.33	0.72	0.43
161	13-Jun-1992	8:38:34	37.323	76.227	487.70	4.23	0.52
162	13-Jun-1992	12:49:35	37.323	76.229	251.02	0.18	0.04
163	13-Jun-1992	18:24:17	37.333	76.335	334.70	9.44	1.69
164	14-Jun-1992	8:27:40	37.333	76.277	843.38	5.13	0.36
165	14-Jun-1992	18:13: 3	37.314	76.289	585.38	2.36	0.24
166	15-Jun-1992	19:41: 9	37.326	76.307	1528.10	2.08	0.08

Appendix 10. Data from loggerhead 4937 tracked via satellite in 1991 - 1992. POINT NO. corresponds to number points in Figure 27. TIME in Greenwich mean time, LAT = north latitude, LONG = west longitude, TSLL = time since last location in minutes, DSLL = distance since last location in km, SPEED = speed since last location in km/h.

POINT NO.	DATE	TIME (GMT)	LAT	LONG	TSLL (m)	DSLL (km)	SPEED (km/h)
1	23-Oct-1991	23:01:15	37.234	76.426			
2	24-Oct-1991	0:38:44	37.248	76.408	97.48	2.23	1.37
3	24-Oct-1991	7:42:24	37.129	76.244	423.67	19.65	2.78
4	24-Oct-1991	12:58:53	37.003	76.203	316.48	14.47	2.74
5	24-Oct-1991	14:38:41	36.966	76.207	99.80	4.13	2.48
6	24-Oct-1991	17:24:44	36.986	76.179	166.05	3.34	1.21
7	24-Oct-1991	19:07:06	36.978	76.188	102.37	1.20	0.70
8	25-Oct-1991	7:29:44	36.736	75.838	742.63	41.16	3.33
9	25-Oct-1991	9:09:34	36.770	75.826	99.83	3.93	2.36
10	26-Oct-1991	20:25:43	36.167	75.436	2116.15	75.57	2.14
11	27-Oct-1991	20:11:34	35.760	75.428	1425.85	45.25	1.90
12	28-Oct-1991	0:56:02	35.674	75.369	284.47	10.94	2.31
13	29-Oct-1991	14:37:14	34.868	75.747	2261.20	95.96	2.55
14	30-Oct-1991	12:34:34	34.608	76.370	1317.33	63.85	2.91
15	31-Oct-1991	21:03:47	34.546	76.967	1949.22	55.10	1.70
16	04-Nov-1991	1:50:23	34.088	77.156	4606.60	53.80	0.70
17	04-Nov-1991	14:09:19	34.058	77.209	738.93	5.91	0.48
18	05-Nov-1991	12:11:37	33.972	77.340	1322.30	15.40	0.70
19	05-Nov-1991	18:26:10	33.886	77.190	374.55	16.82	2.69
20	06-Nov-1991	11:49:42	33.860	77.233	1043.53	4.91	0.28
21	09-Nov-1991	9:39:20	33.789	77.057	4189.63	18.07	0.26
22	12-Nov-1991	14:38:57	33.779	77.209	4619.62	14.09	0.18
23	13-Nov-1991	8:48:19	33.837	77.531	1089.37	30.44	1.68
24	13-Nov-1991	14:23:18	33.761	77.323	334.98	21.00	3.76
25	14-Nov-1991	7:03:48	34.004	77.666	1000.50	41.62	2.50
26	15-Nov-1991	19:49:58	33.639	77.287	2206.17	53.60	1.46
27	17-Nov-1991	14:38:45	33.710	77.384	2568.78	11.95	0.28
28	18-Nov-1991	14:17:52	33.624	77.344	1419.12	10.25	0.43
29	19-Nov-1991	13:56:15	33.659	77.354	1418.38	4.00	0.17
30	20-Nov-1991	11:52:26	33.672	77.386	1316.18	3.30	0.15
31	23-Nov-1991	14:17:22	33.728	77.226	4464.93	16.06	0.22
32	26-Nov-1991	7:57:55	33.670	77.067	3940.55	16.06	0.24
33	26-Nov-1991	21:03:56	33.749	77.284	786.02	21.91	1.67
34	27-Nov-1991	17:33:28	33.705	77.353	1229.53	8.04	0.39
35	29-Nov-1991	9:08:14	33.735	77.259	2374.77	9.31	0.24
36	29-Nov-1991	20:27:06	33.765	77.333	678.87	7.61	0.67
37	30-Nov-1991	1:08:16	33.728	77.260	281.17	7.90	1.69
38	02-Dec-1991	19:49:49	33.738	77.415	4001.55	14.38	0.22
39	04-Dec-1991	1:25:34	33.686	77.251	1775.75	16.24	0.55
40	04-Dec-1991	8:12:30	33.542	77.058	406.93	24.00	3.54
41	06-Dec-1991	0:45:27	33.668	77.651	2432.95	56.68	1.40
42	10-Dec-1991	13:17:52	33.724	77.292	6512.42	33.79	0.31
43	23-Dec-1991	19:02:56	33.725	77.127	19065.07	15.26	0.05
44	25-Dec-1991	14:39:17	33.778	77.562	2616.35	40.65	0.93
45	31-Dec-1991	1:54:15	33.666	77.105	7874.97	44.07	0.34
46	01-Jan-1992	13:57:14	33.696	77.291	2162.98	17.53	0.49

Appendix 10. Continued.

POINT NO.	DATE	TIME (GMT)	LAT	LONG	TSLL (m)	DSLL (km)	SPEED (km/h)
47	05-Jan-1992	1:54:34	33.762	77.201	5037.33	11.10	0.13
48	09-Jan-1992	7:46:21	33.715	77.285	6111.78	9.36	0.09
49	09-Jan-1992	20:47:17	33.761	77.343	780.93	7.41	0.57
50	10-Jan-1992	1:43:59	33.729	77.163	296.70	17.02	3.44
51	12-Jan-1992	15:04:32	33.804	77.238	3680.55	10.84	0.18
52	25-Jan-1992	23:28:56	33.744	77.264	19224.40	7.09	0.02
53	26-Jan-1992	13:27:42	33.751	77.389	838.77	11.58	0.83
54	30-Jan-1992	13:43:23	33.829	77.478	5775.68	11.95	0.12
55	03-Feb-1992	12:26:04	33.702	77.333	5682.68	19.47	0.21
56	05-Feb-1992	13:25:01	33.658	77.302	2938.95	5.67	0.12
57	06-Feb-1992	14:40:19	33.585	77.298	1515.30	8.12	0.32
58	07-Feb-1992	7:08:23	33.650	77.523	988.07	22.05	1.34
59	07-Feb-1992	12:39:05	33.659	77.333	330.70	17.62	3.20
60	07-Feb-1992	18:26:49	33.618	77.325	347.73	4.62	0.80
61	07-Feb-1992	20:08:00	33.591	77.314	101.18	3.17	1.88
62	09-Feb-1992	13:37:35	33.565	77.257	2489.58	6.02	0.15
63	14-Feb-1992	20:29:31	33.780	77.423	7611.93	28.41	0.22
64	16-Feb-1992	22:29:27	33.792	77.416	2999.93	1.48	0.03
65	20-Feb-1992	22:44:27	33.739	77.349	5775.00	8.55	0.09
66	25-Feb-1992	22:39:22	33.656	77.407	7194.92	10.67	0.09
67	27-Feb-1992	8:15:14	33.735	77.200	2015.87	21.07	0.63
68	27-Feb-1992	17:53:11	33.624	77.363	577.95	19.49	2.02
69	01-Mar-1992	12:50:31	33.719	77.122	2577.33	24.68	0.57
70	01-Mar-1992	20:34:37	33.721	77.367	464.10	22.66	2.93
71	06-Mar-1992	9:54:22	33.648	77.216	6559.75	16.16	0.15
72	07-Mar-1992	0:08:38	33.659	77.500	854.27	26.32	1.85
73	08-Mar-1992	17:36:35	33.752	77.388	2487.95	14.64	0.35
74	08-Mar-1992	23:27:09	33.669	77.356	350.57	9.69	1.66
75	20-Mar-1992	22:30:02	33.870	77.287	17222.88	23.24	0.08
76	22-Mar-1992	1:28:03	33.782	77.344	1618.02	11.11	0.41
77	23-Mar-1992	1:09:41	33.773	77.219	1421.63	11.60	0.49
78	25-Mar-1992	2:05:09	33.744	77.295	2935.47	7.73	0.16
79	25-Mar-1992	19:16:39	33.728	77.281	1031.50	2.20	0.13
80	01-Apr-1992	9:49:08	33.685	77.315	9512.48	5.72	0.04
81	02-Apr-1992	21:05:41	33.595	76.992	2116.55	31.53	0.89
82	04-Apr-1992	18:56:01	33.872	77.277	2750.33	40.54	0.88
83	04-Apr-1992	20:36:15	33.932	77.279	100.23	6.67	3.99
84	05-Apr-1992	7:24:48	33.918	77.364	648.55	8.00	0.74
85	06-Apr-1992	1:15:46	34.023	77.020	1070.97	33.81	1.89
86	08-Apr-1992	8:26:04	34.400	76.957	3310.30	42.31	0.77
87	08-Apr-1992	14:29:58	34.495	76.857	363.90	13.99	2.31
88	09-Apr-1992	21:15:37	34.479	76.546	1845.65	28.56	0.93
89	10-Apr-1992	23:25:11	34.529	76.454	1569.57	10.10	0.39
90	11-Apr-1992	1:05:46	34.554	76.433	100.58	3.38	2.02
91	11-Apr-1992	9:35:17	34.593	76.462	509.52	5.08	0.60
92	15-Apr-1992	18:27:59	34.448	76.910	6292.70	44.10	0.42
93	16-Apr-1992	13:21:02	33.938	76.644	1133.05	61.75	3.27
94	17-Apr-1992	9:59:45	34.209	76.432	1238.72	35.90	1.74
95	18-Apr-1992	22:16:39	34.597	76.674	2176.90	48.52	1.34
96	19-Apr-1992	13:55:49	34.329	76.727	939.17	30.19	1.93

Appendix 10. Continued.

POINT NO.	DATE	TIME (GMT)	LAT	LONG	TSLL (m)	DSLL (km)	SPEED (km/h)
97	19-Apr-1992	19:18:08	34.409	76.739	322.32	8.96	1.67
98	20-Apr-1992	11:55:10	34.210	76.729	997.03	22.14	1.33
99	21-Apr-1992	0:51:22	34.313	76.743	776.20	11.52	0.89
100	22-Apr-1992	12:55:12	34.431	77.092	2163.83	34.62	0.96
101	23-Apr-1992	14:12:33	34.424	77.182	1517.35	8.29	0.33
102	23-Apr-1992	20:11:15	34.323	77.292	358.70	15.10	2.53
103	23-Apr-1992	23:50:42	34.363	77.382	219.45	9.38	2.57
104	24-Apr-1992	10:16:38	34.377	77.398	625.93	2.14	0.21
105	24-Apr-1992	12:13:39	34.354	77.470	117.02	7.09	3.63
106	25-Apr-1992	1:09:33	34.263	77.425	775.90	10.93	0.85
107	25-Apr-1992	13:26:43	34.271	77.559	737.17	12.35	1.00
108	25-Apr-1992	18:07:34	34.289	77.542	280.85	2.54	0.54
109	25-Apr-1992	21:26:30	34.338	77.494	198.93	7.01	2.11
110	27-Apr-1992	21:04:12	34.215	77.715	2857.70	24.48	0.51
111	28-Apr-1992	12:25:32	33.842	77.608	921.33	42.63	2.78
112	28-Apr-1992	20:50:11	33.962	77.748	504.65	18.57	2.21
113	29-Apr-1992	1:24:53	33.941	77.694	274.70	5.50	1.20
114	29-Apr-1992	9:16:52	33.854	77.663	471.98	10.09	1.28
115	03-May-1992	1:42:36	34.301	77.172	5305.73	67.19	0.76
116	03-May-1992	13:58:35	34.319	77.347	735.98	16.20	1.32
117	09-May-1992	11:51:48	34.474	76.237	8513.22	103.30	0.73
118	15-May-1992	22:44:35	35.411	75.474	9292.78	125.26	0.81
119	18-May-1992	12:03:48	35.756	75.546	3679.22	38.90	0.63
120	19-May-1992	1:02:46	35.846	75.414	778.97	15.55	1.20
121	19-May-1992	13:23:50	35.979	75.636	741.07	24.87	2.01
122	31-May-1992	20:59:08	37.232	76.246	17735.30	149.57	0.51
123	07-Jun-1992	9:53:01	37.225	76.191	9413.88	4.93	0.03
124	13-Jun-1992	10:18:10	37.247	76.506	8665.15	28.00	0.19
125	15-Jun-1992	19:41:18	37.264	76.297	3443.13	18.60	0.32
126	22-Jun-1992	14:37:34	37.109	76.356	9776.27	18.01	0.11
127	25-Jun-1992	11:54:25	37.107	76.289	4156.85	5.95	0.09
128	28-Jun-1992	12:31:50	37.295	76.602	4357.42	34.72	0.48
129	07-Jul-1992	8:54:38	37.150	76.160	12742.80	42.33	0.20
130	09-Jul-1992	1:17:28	37.560	76.278	2422.83	46.76	1.16
131	13-Jul-1992	12:11:28	36.914	76.338	6414.00	72.02	0.67
132	17-Jul-1992	14:07:06	36.980	76.151	5875.63	18.17	0.19

Appendix 11. Data from loggerhead 4935 tracked via satellite in 1991 - 1992. POINT NO. corresponds to number points in Figure 29. TIME in Greenwich mean time, LAT = north latitude, LONG = west longitude, TSLL = time since last location in minutes, DSLL = distance since last location in km, SPEED = speed since last location in km/h.

POINT NO.	DATE	TIME (GMT)	LAT	LONG	TSLL (m)	DSLL (km)	SPEED (km/h)
1	29-Oct-1991	0:33:20	36.653	75.811			
2	29-Oct-1991	10:05:55	36.456	75.672	572.58	25.18	2.64
3	29-Oct-1991	19:47:26	36.443	75.668	581.52	1.49	0.15
4	30-Oct-1991	6:31:53	36.242	75.703	644.45	22.57	2.10
5	31-Oct-1991	9:41:19	35.809	75.477	1629.43	52.26	1.92
6	31-Oct-1991	12:10:57	35.721	75.395	149.63	12.27	4.92
7	31-Oct-1991	17:43:54	35.743	75.443	332.95	4.98	0.90
8	01-Nov-1991	9:30:46	35.308	75.297	946.87	50.13	3.18
9	02-Nov-1991	22:45:47	35.239	75.018	2235.02	26.47	0.71
10	05-Nov-1991	6:57:07	35.096	75.188	3371.33	22.17	0.39
11	05-Nov-1991	23:28:11	35.083	75.791	991.07	54.89	3.32
12	06-Nov-1991	11:44:08	35.012	75.545	735.95	23.75	1.94
13	06-Nov-1991	19:53:08	35.066	75.813	489.00	25.13	3.08
14	07-Nov-1991	0:45:50	35.122	75.863	292.70	7.71	1.58
15	08-Nov-1991	19:31:19	35.011	76.000	2565.48	17.54	0.41
16	09-Nov-1991	12:22:00	34.963	75.549	1010.68	41.44	2.46
17	10-Nov-1991	1:27:33	34.914	75.744	785.55	18.59	1.42
18	12-Nov-1991	18:45:18	35.083	75.831	3917.75	20.39	0.31
19	12-Nov-1991	22:40:08	35.109	75.749	234.83	8.00	2.04
20	13-Nov-1991	20:16:31	35.021	75.584	1296.38	17.92	0.83
21	14-Nov-1991	18:24:01	34.955	75.200	1327.50	35.75	1.62
22	15-Nov-1991	13:40:47	35.296	75.008	1156.77	41.74	2.16
23	15-Nov-1991	19:53:26	35.304	75.142	372.65	12.19	1.96
24	16-Nov-1991	11:41:09	35.454	75.449	947.72	32.45	2.05
25	16-Nov-1991	14:58:33	35.470	75.276	197.40	15.77	4.79
26	16-Nov-1991	19:38:09	35.502	75.375	279.60	9.64	2.07
27	19-Nov-1991	13:50:45	35.327	75.379	3972.60	19.46	0.29
28	19-Nov-1991	20:41:04	35.192	75.409	410.32	15.25	2.23
29	23-Nov-1991	12:32:11	35.317	75.396	5271.12	13.95	0.16
30	24-Nov-1991	8:21:54	35.335	75.456	1189.72	5.80	0.29
31	28-Nov-1991	20:38:53	35.311	75.366	6496.98	8.59	0.08
32	30-Nov-1991	13:23:34	35.187	75.162	2444.68	23.09	0.57
33	01-Dec-1991	18:21:51	35.311	75.399	1738.28	25.56	0.88
34	01-Dec-1991	20:03:09	35.329	75.334	101.30	6.23	3.69
35	04-Dec-1991	19:29:51	35.160	75.359	4286.70	18.93	0.26
36	05-Dec-1991	17:40:44	34.976	75.752	1330.88	41.21	1.86
37	07-Dec-1991	18:52:04	35.215	75.151	2951.33	60.80	1.24
38	09-Dec-1991	10:27:17	34.910	75.441	2375.22	42.97	1.09
39	10-Dec-1991	6:55:33	35.069	75.441	1228.27	17.68	0.86
40	14-Dec-1991	9:34:11	35.055	74.862	5918.63	52.73	0.53
41	16-Dec-1991	7:26:40	35.060	75.605	2752.48	67.64	1.47
42	16-Dec-1991	11:11:36	35.004	75.664	224.93	8.22	2.19
43	17-Dec-1991	20:14:11	35.108	75.632	1982.58	11.92	0.36
44	19-Dec-1991	10:10:32	34.835	75.898	2276.35	38.84	1.02
45	19-Dec-1991	19:54:57	35.065	75.519	584.42	42.98	4.41
46	20-Dec-1991	14:47:38	34.980	75.533	1132.68	9.54	0.51

Appendix 11. Continued.

POINT NO.	DATE	TIME (GMT)	LAT	LONG	TSLL (m)	DSLL (km)	SPEED (km/h)
47	21-Dec-1991	14:29:35	35.010	75.322	1421.95	19.51	0.82
48	22-Dec-1991	9:37:01	34.963	75.509	1147.43	17.82	0.93
49	23-Dec-1991	7:43:02	34.990	75.506	1326.02	3.01	0.14
50	24-Dec-1991	9:12:43	35.167	75.293	1529.68	27.62	1.08
51	25-Dec-1991	8:58:01	35.193	75.658	1425.30	33.30	1.40
52	30-Dec-1991	9:47:03	35.116	75.278	7249.03	35.60	0.29
53	30-Dec-1991	14:36:31	35.162	75.423	289.47	14.14	2.93
54	30-Dec-1991	17:44:48	35.118	75.439	188.28	5.10	1.63
55	30-Dec-1991	22:36:19	35.174	75.457	291.52	6.44	1.32
56	02-Jan-1992	18:52:49	35.065	75.506	4096.50	12.91	0.19
57	04-Jan-1992	18:26:23	35.188	75.513	2853.57	13.69	0.29
58	04-Jan-1992	20:07:21	35.210	75.529	100.97	2.85	1.69
59	06-Jan-1992	10:00:37	35.104	75.811	2273.27	28.22	0.74
60	12-Jan-1992	13:24:40	35.040	75.785	8844.05	7.50	0.05
61	12-Jan-1992	18:38:14	34.979	75.972	313.57	18.33	3.51
62	15-Jan-1992	14:04:22	35.073	75.544	4046.13	40.35	0.60
63	21-Jan-1992	10:24:35	34.920	76.104	8420.22	53.78	0.38
64	23-Jan-1992	10:02:08	35.048	75.649	2857.55	43.83	0.92
65	23-Jan-1992	18:06:04	35.165	75.794	483.93	18.53	2.30
66	31-Jan-1992	18:10:58	35.253	75.404	11524.90	36.76	0.19
67	03-Feb-1992	9:38:40	35.100	75.313	3807.70	18.91	0.30
68	03-Feb-1992	17:37:15	35.035	75.510	478.58	19.33	2.42
69	03-Feb-1992	19:15:33	35.008	75.509	98.30	3.00	1.83
70	04-Feb-1992	7:41:06	34.993	75.470	745.55	3.92	0.32
71	04-Feb-1992	9:22:14	34.988	75.478	101.13	0.92	0.54
72	04-Feb-1992	12:01:07	34.991	75.493	158.88	1.41	0.53
73	04-Feb-1992	13:42:16	34.986	75.511	101.15	1.73	1.03
74	05-Feb-1992	1:01:00	35.029	75.505	678.73	4.81	0.43
75	05-Feb-1992	18:51:46	35.057	75.458	1070.77	5.29	0.30
76	07-Feb-1992	20:11:29	34.957	75.785	2959.72	31.79	0.64
77	07-Feb-1992	23:58:55	34.920	75.915	227.43	12.54	3.31
78	11-Feb-1992	0:31:05	34.845	76.051	4352.17	14.95	0.21
79	13-Feb-1992	1:35:19	34.761	75.844	2944.23	21.08	0.43
80	14-Feb-1992	13:29:30	34.854	76.054	2154.18	21.78	0.61
81	16-Feb-1992	12:52:06	34.980	76.164	2842.60	17.23	0.36
82	24-Feb-1992	14:58:22	34.953	76.257	11646.27	8.99	0.05
83	26-Feb-1992	18:03:20	34.936	76.141	3064.97	10.74	0.21
84	26-Feb-1992	22:16:38	34.912	76.138	253.30	2.68	0.64
85	28-Feb-1992	8:05:21	35.171	76.076	2028.72	29.34	0.87
86	29-Feb-1992	11:32:58	35.007	76.119	1647.62	18.65	0.68
87	01-Mar-1992	22:34:08	35.031	76.104	661.17	3.00	0.27
88	08-Mar-1992	12:07:05	35.006	76.103	9452.95	2.78	0.02
89	08-Mar-1992	19:12:01	35.123	76.217	424.93	16.64	2.35
90	09-Mar-1992	20:46:28	35.043	75.992	1534.45	22.32	0.87
91	12-Mar-1992	10:26:48	34.852	75.836	3700.33	25.56	0.41
92	14-Mar-1992	22:54:15	35.390	75.431	3627.45	70.25	1.16
93	16-Mar-1992	23:55:18	35.157	75.940	2941.05	52.98	1.08
94	17-Mar-1992	7:45:12	35.159	76.037	469.90	8.82	1.13
95	17-Mar-1992	9:28:32	35.213	75.991	103.33	7.32	4.25
96	18-Mar-1992	1:15:57	35.165	75.909	947.42	9.17	0.58

Appendix 11. Continued.

POINT NO.	DATE	TIME (GMT)	LAT	LONG	TSLL (m)	DSLL (km)	SPEED (km/h)
97	18-Mar-1992	7:33:35	35.089	75.954	377.63	9.39	1.49
98	18-Mar-1992	23:11:45	35.217	75.913	938.17	14.71	0.94
99	19-Mar-1992	22:54:03	35.132	76.130	1422.30	21.87	0.92
100	20-Mar-1992	7:13:04	35.209	76.268	499.02	15.19	1.83
101	21-Mar-1992	7:02:19	35.344	76.427	1429.25	20.82	0.87
102	23-Mar-1992	8:14:23	34.994	75.625	2952.07	82.64	1.68
103	24-Mar-1992	8:02:57	34.719	75.820	1428.57	35.37	1.49
104	25-Mar-1992	19:12:45	35.175	75.882	2109.80	51.01	1.45
105	26-Mar-1992	7:38:41	35.015	75.975	745.93	19.70	1.58
106	26-Mar-1992	19:01:48	35.042	75.916	683.12	6.15	0.54
107	28-Mar-1992	20:19:43	34.984	75.808	2957.92	11.76	0.24
108	30-Mar-1992	12:38:09	34.971	75.858	2418.43	4.78	0.12
109	31-Mar-1992	18:01:28	34.966	75.816	1763.32	3.87	0.13
110	01-Apr-1992	1:19:22	35.004	75.758	437.90	6.77	0.93
111	09-Apr-1992	14:10:16	34.950	75.772	12290.90	6.14	0.03
112	11-Apr-1992	1:10:35	34.769	75.528	2100.32	30.01	0.86
113	12-Apr-1992	0:41:31	34.939	75.927	1410.93	41.02	1.74
114	16-Apr-1992	19:56:27	35.070	75.559	6914.93	36.55	0.32
115	18-Apr-1992	12:35:19	35.152	75.548	2438.87	9.17	0.23
116	20-Apr-1992	13:35:50	35.195	75.427	2940.52	11.99	0.24
117	21-Apr-1992	9:15:57	35.217	75.378	1180.12	5.08	0.26
118	29-Apr-1992	12:07:48	35.407	75.461	11691.85	22.43	0.12
119	29-Apr-1992	20:37:17	35.226	75.441	509.48	20.20	2.38
120	30-Apr-1992	9:00:39	35.202	75.534	743.37	8.86	0.72
121	30-Apr-1992	18:47:38	35.127	75.367	586.98	17.32	1.77
122	30-Apr-1992	20:27:03	35.108	75.354	99.42	2.42	1.46
123	30-Apr-1992	23:03:12	35.137	75.353	156.15	3.23	1.24
124	01-May-1992	0:42:38	35.166	75.329	99.43	3.89	2.35
125	01-May-1992	11:22:23	35.266	75.350	639.75	11.28	1.06
126	03-May-1992	8:26:57	35.259	75.147	2704.57	18.45	0.41
127	05-May-1992	0:56:17	35.423	75.466	2429.33	34.20	0.84
128	07-May-1992	12:33:58	35.456	75.460	3577.68	3.71	0.06
129	08-May-1992	1:35:39	35.512	75.349	781.68	11.82	0.91
130	08-May-1992	9:13:31	35.471	75.038	457.87	28.53	3.74
131	10-May-1992	8:47:26	35.651	75.220	2853.92	25.91	0.54
132	13-May-1992	1:30:33	35.697	75.200	3883.12	5.42	0.08
133	15-May-1992	0:45:37	35.786	75.508	2835.07	29.51	0.62
134	15-May-1992	20:47:06	35.966	75.456	1201.48	20.55	1.03
135	16-May-1992	0:28:21	35.975	75.471	221.25	1.68	0.46
136	16-May-1992	9:14:22	36.066	75.578	526.02	13.96	1.59
137	16-May-1992	20:37:30	36.023	75.636	683.13	7.07	0.62
138	18-May-1992	20:12:41	36.018	75.639	2855.18	0.62	0.01
139	19-May-1992	1:01:40	36.065	75.637	288.98	5.23	1.09
140	19-May-1992	13:18:05	36.056	75.669	736.42	3.05	0.25
141	23-May-1992	1:19:04	35.917	75.493	5040.98	22.13	0.26
142	24-May-1992	0:56:29	35.885	75.556	1417.42	6.70	0.28

Appendix 12. Data from loggerhead 1235 tracked via satellite in 1992. POINT NO. corresponds to number points in Figure 31. TIME in Greenwich mean time, LAT = north latitude, LONG = west longitude, TSLL = time since last location in minutes, DSLL = distance since last location in km, SPEED = speed since last location in km/h.

POINT NO.	DATE	TIME (GMT)	LAT	LONG	TSLL (m)	DSLL (km)	SPEED (km/h)
1	31-Jul-1992	1:50:41	36.755	75.804			
2	05-Aug-1992	0:02:50	35.460	75.458	7092.15	147.29	1.25
3	05-Aug-1992	12:23:10	35.298	75.504	740.33	18.49	1.50
4	09-Aug-1992	9:01:19	35.171	75.643	5558.15	18.94	0.20
5	09-Aug-1992	12:34:01	35.215	75.610	212.70	5.74	1.62
6	09-Aug-1992	20:21:09	35.142	75.851	467.13	23.36	3.00
7	09-Aug-1992	22:16:10	35.166	75.794	115.02	5.83	3.04
8	10-Aug-1992	1:37:07	35.155	75.840	200.95	4.36	1.30
9	10-Aug-1992	13:54:57	35.059	75.991	737.83	17.40	1.41
10	10-Aug-1992	18:30:37	35.019	76.061	275.67	7.77	1.69
11	13-Aug-1992	19:32:39	34.460	76.494	4382.03	73.68	1.01
12	18-Aug-1992	20:20:53	33.468	77.592	7248.23	149.73	1.24
13	19-Aug-1992	14:10:27	33.412	78.145	1069.57	51.69	2.90
14	19-Aug-1992	23:42:25	33.280	78.317	571.97	21.70	2.28
15	22-Aug-1992	19:26:24	32.319	79.374	4063.98	145.52	2.15
16	23-Aug-1992	0:18:06	32.222	79.403	291.70	11.12	2.29
17	23-Aug-1992	12:42:50	32.011	79.648	744.73	32.91	2.65
18	23-Aug-1992	19:12:57	31.882	79.879	390.12	26.09	4.01
19	24-Aug-1992	9:26:47	31.847	79.987	853.83	10.92	0.77
20	24-Aug-1992	19:05:52	31.749	79.921	579.08	12.55	1.30
21	25-Aug-1992	12:00:17	31.595	80.248	1014.42	35.37	2.09
22	25-Aug-1992	23:13:57	31.508	80.365	673.67	14.71	1.31
23	26-Aug-1992	10:38:27	31.393	80.560	684.50	22.49	1.97
24	26-Aug-1992	14:58:56	31.335	80.607	260.48	7.84	1.81
25	26-Aug-1992	18:38:52	31.237	80.609	219.93	10.90	2.97
26	27-Aug-1992	2:15:23	31.135	80.762	456.52	18.45	2.43
27	27-Aug-1992	20:08:56	30.872	80.866	1073.55	30.87	1.73
28	28-Aug-1992	8:35:08	30.758	80.888	746.20	12.85	1.03
29	28-Aug-1992	10:15:08	30.757	80.937	100.00	4.68	2.81
30	29-Aug-1992	8:23:42	30.532	81.015	1328.57	26.10	1.18
31	29-Aug-1992	10:08:57	30.500	81.078	105.25	7.01	3.99
32	29-Aug-1992	12:18:07	30.409	81.012	129.17	11.93	5.54
33	01-Sep-1992	9:33:00	29.882	80.983	4154.88	58.66	0.85
34	04-Sep-1992	10:31:42	29.592	80.808	4378.70	36.40	0.50
35	04-Sep-1992	11:45:20	29.536	80.822	73.63	6.37	5.19
36	04-Sep-1992	22:58:15	29.426	80.738	672.92	14.69	1.31
37	05-Sep-1992	8:35:13	29.477	80.804	576.97	8.54	0.89
38	06-Sep-1992	0:21:32	29.427	80.820	946.32	5.77	0.37
39	07-Sep-1992	1:43:29	29.453	80.349	1521.95	45.70	1.80
40	07-Sep-1992	14:01:26	29.522	80.807	737.95	44.99	3.66
41	07-Sep-1992	23:37:13	29.614	80.893	575.78	13.18	1.37
42	08-Sep-1992	9:49:02	29.556	80.454	611.82	42.94	4.21
43	08-Sep-1992	11:55:09	29.621	80.475	126.12	7.51	3.57

Appendix 13. Data from loggerhead 4931 tracked via satellite in 1989 - 1990. POINT NO. corresponds to number points in Figure 33. TIME in Greenwich mean time, LAT = north latitude, LONG = west longitude, TSLL = time since last location in minutes, DSLL = distance since last location in km, SPEED = speed since last location in km/h.

POINT NO.	DATE	TIME (GMT)	LAT	LONG	TSLL (m)	DSLL (km)	SPEED (km/h)
1	05-Oct-1989	1:18:04	36.613	75.703			
2	05-Oct-1989	15:09:30	36.685	75.616	831.43	11.15	0.80
3	05-Oct-1989	18:03:32	36.708	75.524	174.03	8.59	2.96
4	06-Oct-1989	14:46:38	36.832	75.292	1243.10	24.84	1.20
5	06-Oct-1989	17:54:17	36.839	75.200	187.65	8.23	2.63
6	07-Oct-1989	14:27:38	36.733	74.849	1233.35	33.41	1.63
7	07-Oct-1989	17:42:37	36.659	74.871	194.98	8.46	2.60
8	08-Oct-1989	1:48:11	36.616	74.782	485.57	9.27	1.15
9	08-Oct-1989	6:09:13	36.537	74.770	261.03	8.85	2.03
10	08-Oct-1989	17:30:47	36.408	74.710	681.57	15.31	1.35
11	08-Oct-1989	19:11:52	36.397	74.689	101.08	2.24	1.33
12	09-Oct-1989	1:24:29	36.242	74.609	372.62	18.66	3.01
13	09-Oct-1989	5:56:41	36.093	74.553	272.20	17.31	3.82
14	09-Oct-1989	13:43:18	35.933	74.545	466.62	17.80	2.29
15	09-Oct-1989	17:20:19	35.859	74.581	217.02	8.84	2.44
16	09-Oct-1989	19:02:48	35.834	74.564	102.48	3.17	1.86
17	10-Oct-1989	17:11:46	35.889	73.403	1328.97	104.81	4.73
18	12-Oct-1989	14:14:09	37.084	72.262	2702.38	167.50	3.72
19	12-Oct-1989	16:51:09	37.113	72.216	157.00	5.20	1.99
20	12-Oct-1989	18:30:55	37.158	72.233	99.77	5.23	3.14
21	13-Oct-1989	1:35:55	37.309	72.103	425.00	20.35	2.87
22	13-Oct-1989	6:55:39	37.350	72.086	319.73	4.80	0.90
23	13-Oct-1989	13:54:01	37.388	72.034	418.37	6.24	0.90
24	13-Oct-1989	16:43:12	37.404	72.036	169.18	1.79	0.63
25	14-Oct-1989	6:45:22	37.462	71.840	842.17	18.47	1.32
26	14-Oct-1989	13:30:43	37.556	71.799	405.35	11.06	1.64
27	15-Oct-1989	6:37:10	37.645	71.661	1026.45	15.68	0.92
28	15-Oct-1989	14:46:47	37.712	71.657	489.62	7.46	0.91
29	15-Oct-1989	17:59:31	37.738	71.648	192.73	3.00	0.93
30	16-Oct-1989	6:21:21	37.896	71.670	741.83	17.67	1.43
31	16-Oct-1989	14:25:11	37.967	71.770	483.83	11.80	1.46
32	17-Oct-1989	1:46:57	38.007	71.837	681.77	7.37	0.65
33	17-Oct-1989	6:12:06	38.068	71.898	265.15	8.63	1.95
34	17-Oct-1989	14:02:27	38.131	71.985	470.35	10.35	1.32
35	17-Oct-1989	16:00:06	38.124	71.982	117.65	0.82	0.42
36	17-Oct-1989	17:39:12	38.135	72.011	99.10	2.82	1.71
37	18-Oct-1989	13:40:41	38.220	72.157	1201.48	15.88	0.79
38	18-Oct-1989	17:28:28	38.219	72.177	227.78	1.75	0.46
39	18-Oct-1989	19:11:17	38.216	72.208	102.82	2.73	1.59
40	19-Oct-1989	13:21:31	38.176	72.162	1090.23	5.99	0.33
41	19-Oct-1989	14:55:51	38.177	72.177	94.33	1.32	0.84
42	19-Oct-1989	17:17:20	38.160	72.182	141.48	1.94	0.82
43	19-Oct-1989	18:59:50	38.148	72.188	102.50	1.43	0.84
44	20-Oct-1989	14:35:46	38.163	72.242	1175.93	5.01	0.26
45	20-Oct-1989	17:07:14	38.176	72.249	151.47	1.57	0.62
46	20-Oct-1989	18:49:25	38.187	72.230	102.18	2.06	1.21

Appendix 13. Continued.

POINT NO.	DATE	TIME (GMT)	LAT	LONG	TSLL (m)	DSLL (km)	SPEED (km/h)
47	21-Oct-1989	16:56:26	38.210	72.176	1327.02	5.37	0.24
48	22-Oct-1989	13:51:09	38.271	72.159	1254.72	6.94	0.33
49	22-Oct-1989	16:47:04	38.263	72.136	175.92	2.20	0.75
50	22-Oct-1989	18:27:02	38.260	72.125	99.97	1.02	0.61
51	23-Oct-1989	6:49:30	38.317	72.173	742.47	7.60	0.61
52	23-Oct-1989	13:28:59	38.294	72.211	399.48	4.19	0.63
53	23-Oct-1989	15:07:25	38.303	72.215	98.43	1.06	0.65
54	23-Oct-1989	16:35:13	38.302	72.246	87.80	2.71	1.85
55	24-Oct-1989	14:44:05	38.381	72.369	1328.87	13.87	0.63
56	24-Oct-1989	16:24:54	38.422	72.368	100.82	4.56	2.71
57	24-Oct-1989	18:05:58	38.402	72.439	101.07	6.57	3.90
58	26-Oct-1989	14:00:50	38.703	72.972	2634.87	57.17	1.30
59	26-Oct-1989	17:42:38	38.681	73.006	221.80	3.83	1.04
60	27-Oct-1989	13:39:37	38.782	73.293	1196.98	27.31	1.37
61	27-Oct-1989	15:16:56	38.737	73.308	97.32	5.17	3.19
62	28-Oct-1989	5:59:35	38.772	73.616	882.65	26.99	1.83
63	28-Oct-1989	13:20:23	38.818	73.757	440.80	13.25	1.80
64	28-Oct-1989	14:55:06	38.805	73.822	94.72	5.81	3.68
65	28-Oct-1989	17:24:47	38.853	73.675	149.68	13.81	5.53
66	28-Oct-1989	19:05:15	38.848	73.706	100.47	2.74	1.64
67	29-Oct-1989	5:46:44	38.898	73.803	641.48	10.07	0.94
68	29-Oct-1989	14:36:49	38.896	73.870	530.08	5.80	0.66
69	29-Oct-1989	17:13:30	38.953	73.952	156.68	9.51	3.64
70	29-Oct-1989	18:54:18	38.961	73.916	100.80	3.24	1.93
71	30-Oct-1989	14:11:04	38.953	74.186	1156.77	23.37	1.21
72	30-Oct-1989	17:03:36	38.972	74.228	172.53	4.20	1.46
73	31-Oct-1989	5:27:05	38.988	74.439	743.48	18.33	1.48
74	31-Oct-1989	13:50:54	39.018	74.546	503.82	9.83	1.17
75	31-Oct-1989	16:53:59	39.010	74.577	183.08	2.82	0.93
76	31-Oct-1989	18:33:23	39.024	74.582	99.40	1.62	0.98
77	02-Nov-1989	16:33:23	38.840	75.076	2760.00	47.38	1.03
78	02-Nov-1989	18:12:10	38.831	75.094	98.78	1.85	1.13
79	03-Nov-1989	6:36:32	38.687	75.091	744.37	16.01	1.29
80	03-Nov-1989	14:22:34	38.602	75.074	466.03	9.56	1.23
81	03-Nov-1989	16:22:05	38.592	75.088	119.52	1.65	0.83
82	03-Nov-1989	18:02:06	38.598	75.102	100.02	1.39	0.83
83	04-Nov-1989	14:01:23	38.442	75.017	1199.28	18.85	0.94
84	06-Nov-1989	14:51:08	37.972	75.119	2929.75	53.01	1.09
85	07-Nov-1989	17:18:49	37.905	75.299	1587.68	17.46	0.66
86	10-Nov-1989	13:26:02	37.520	75.422	4087.22	44.15	0.65
87	11-Nov-1989	6:56:29	37.440	75.565	1050.45	15.44	0.88
88	11-Nov-1989	14:42:00	37.377	75.597	465.52	7.55	0.97
89	11-Nov-1989	16:37:36	37.388	75.584	115.60	1.68	0.87
90	12-Nov-1989	16:27:27	37.265	75.618	1429.85	14.00	0.59
91	12-Nov-1989	18:07:34	37.254	75.628	100.12	1.51	0.90
92	13-Nov-1989	13:55:38	37.107	75.824	1188.07	23.85	1.20
93	13-Nov-1989	16:17:19	37.114	75.825	141.68	0.78	0.33
94	14-Nov-1989	13:35:18	36.999	75.984	1277.98	19.04	0.89
95	15-Nov-1989	14:48:50	36.736	75.889	1513.53	30.44	1.21
96	15-Nov-1989	19:10:31	36.762	75.913	261.68	3.60	0.82

Appendix 13. Continued.

POINT NO.	DATE	TIME (GMT)	LAT	LONG	TSLL (m)	DSLL (km)	SPEED (km/h)
97	16-Nov-1989	5:56:36	36.626	75.854	646.08	16.01	1.49
98	17-Nov-1989	14:07:47	36.412	75.824	1931.18	23.94	0.74
99	17-Nov-1989	17:14:24	36.380	75.788	186.62	4.80	1.54
100	17-Nov-1989	18:51:36	36.344	75.795	97.20	4.05	2.50
101	18-Nov-1989	13:45:44	36.211	75.755	1134.13	15.22	0.80
102	19-Nov-1989	7:05:27	36.145	75.684	1039.72	9.72	0.56
103	19-Nov-1989	13:24:41	36.099	75.685	379.23	5.12	0.81
104	20-Nov-1989	14:39:50	36.030	75.629	1515.15	9.18	0.36
105	20-Nov-1989	16:44:43	36.036	75.628	124.88	0.67	0.32
106	20-Nov-1989	18:23:12	36.046	75.669	98.48	3.85	2.35
107	21-Nov-1989	14:17:29	36.060	75.580	1194.28	8.15	0.41
108	21-Nov-1989	16:33:40	36.039	75.554	136.18	3.30	1.46
109	21-Nov-1989	18:12:11	36.006	75.549	98.52	3.70	2.25
110	22-Nov-1989	13:55:36	35.911	75.493	1183.42	11.70	0.59
111	23-Nov-1989	17:50:47	35.612	75.427	1675.18	33.77	1.21
112	24-Nov-1989	14:49:21	35.249	75.395	1258.57	40.46	1.93
113	24-Nov-1989	19:18:15	35.171	75.302	268.90	12.11	2.70
114	25-Nov-1989	14:27:52	34.957	75.480	1149.62	28.78	1.50
115	25-Nov-1989	17:33:04	34.979	75.464	185.20	2.85	0.92
116	25-Nov-1989	19:08:12	34.973	75.480	95.13	1.60	1.01
117	27-Nov-1989	13:46:28	35.023	75.399	2558.27	9.24	0.22
118	29-Nov-1989	14:37:40	35.080	75.454	2931.20	8.08	0.17
119	02-Dec-1989	13:30:10	35.044	75.737	4252.50	26.07	0.37
120	02-Dec-1989	15:09:04	35.019	75.718	98.90	3.27	1.99
121	03-Dec-1989	17:40:41	35.151	75.747	1591.62	14.91	0.56
122	04-Dec-1989	6:08:48	35.037	75.708	748.12	13.16	1.06
123	05-Dec-1989	17:23:55	35.090	75.610	2115.12	10.69	0.30
124	07-Dec-1989	13:21:54	35.190	75.504	2637.98	14.71	0.33
125	07-Dec-1989	17:03:01	35.168	75.629	221.12	11.62	3.15
126	07-Dec-1989	18:43:49	35.164	75.647	100.80	1.70	1.01
127	08-Dec-1989	5:28:13	35.113	75.714	644.40	8.32	0.77
128	08-Dec-1989	16:52:04	35.066	75.791	683.85	8.74	0.77
129	08-Dec-1989	18:33:13	35.080	75.731	101.15	5.68	3.37
130	09-Dec-1989	1:54:01	34.980	76.001	440.80	26.98	3.67
131	09-Dec-1989	14:12:41	34.834	76.123	738.67	19.68	1.60
132	09-Dec-1989	16:44:03	34.791	76.215	151.37	9.66	3.83
133	09-Dec-1989	18:22:47	34.748	76.220	98.73	4.80	2.92
134	10-Dec-1989	6:52:29	34.544	76.396	749.70	27.81	2.23
135	10-Dec-1989	16:31:52	34.272	76.340	579.38	30.67	3.18
136	16-Dec-1989	5:44:35	34.202	76.902	7992.72	52.25	0.39
137	17-Dec-1989	7:10:18	34.192	76.534	1525.72	33.87	1.33
138	17-Dec-1989	16:58:31	34.166	76.974	588.22	40.58	4.14
139	18-Dec-1989	14:09:31	34.154	76.991	1271.00	2.06	0.10
140	20-Dec-1989	13:25:01	34.141	76.996	2835.50	1.52	0.03
141	20-Dec-1989	18:06:02	34.141	77.030	281.02	3.13	0.67
142	21-Dec-1989	14:41:36	34.125	77.105	1235.57	7.13	0.35
143	21-Dec-1989	17:55:20	34.101	77.146	193.73	4.62	1.43
144	22-Dec-1989	14:19:07	34.060	77.210	1223.78	7.45	0.37
145	22-Dec-1989	17:45:09	34.033	77.277	206.03	6.86	2.00
146	23-Dec-1989	13:56:37	33.964	77.345	1211.47	9.91	0.49

Appendix 13. Continued.

POINT NO.	DATE	TIME (GMT)	LAT	LONG	TSLL (m)	DSLL (km)	SPEED (km/h)
147	23-Dec-1989	17:33:14	33.914	77.379	216.62	6.38	1.77
148	23-Dec-1989	19:15:04	33.884	77.399	101.83	3.81	2.25
149	24-Dec-1989	13:35:27	33.666	77.518	1100.38	26.62	1.45
150	24-Dec-1989	17:23:42	33.573	77.514	228.25	10.35	2.72
151	24-Dec-1989	19:05:32	33.546	77.517	101.83	3.01	1.78
152	25-Dec-1989	17:13:17	33.336	77.684	1327.75	28.02	1.27
153	25-Dec-1989	18:53:24	33.338	77.702	100.12	1.69	1.01
154	27-Dec-1989	14:06:28	33.319	77.764	2593.07	6.14	0.14
155	28-Dec-1989	13:47:11	33.308	77.688	1420.72	7.17	0.30
156	29-Dec-1989	6:46:14	33.277	77.746	1019.05	6.40	0.38
157	29-Dec-1989	15:01:34	33.315	77.706	495.33	5.63	0.68
158	29-Dec-1989	18:10:11	33.294	77.665	188.62	4.47	1.42
159	31-Dec-1989	14:18:46	33.357	77.596	2648.58	9.50	0.22
160	31-Dec-1989	17:48:55	33.422	77.528	210.15	9.60	2.74
161	01-Jan-1990	17:43:13	33.452	77.490	1434.30	4.85	0.20
162	02-Jan-1990	6:03:41	33.426	77.437	740.47	5.71	0.46
163	03-Jan-1990	17:21:58	33.388	77.569	2118.28	12.96	0.37
164	05-Jan-1990	1:40:39	33.511	77.557	1938.68	13.72	0.42

Appendix 14. Data from loggerhead 1228 tracked via satellite in 1991. POINT NO. corresponds to number points in Figure 35. TIME in Greenwich mean time, LAT = north latitude, LONG = west longitude, TSLL = time since last location in minutes, DSLL = distance since last location in km, SPEED = speed since last location in km/h.

POINT NO.	DATE	TIME (GMT)	LAT	LONG	TSLL (m)	DSLL (km)	SPEED (km/h)
1	20-Sep-1991	0:47:02	36.899	75.890			
2	20-Sep-1991	11:25:04	36.855	75.763	638.03	12.31	1.16
3	20-Sep-1991	13:06:25	36.829	75.728	101.35	4.25	2.52
4	20-Sep-1991	14:45:59	36.812	75.752	99.57	2.85	1.72
5	20-Sep-1991	18:59:23	36.764	75.751	253.40	5.34	1.26
6	20-Sep-1991	20:38:20	36.752	75.696	98.95	5.08	3.08
7	20-Sep-1991	22:48:24	36.750	75.654	130.07	3.75	1.73
8	21-Sep-1991	0:25:53	36.750	75.650	97.48	0.36	0.22
9	21-Sep-1991	7:21:36	36.744	75.555	415.72	8.49	1.23
10	21-Sep-1991	12:45:36	36.752	75.481	324.00	6.65	1.23
11	21-Sep-1991	14:24:36	36.741	75.441	99.00	3.77	2.28
12	21-Sep-1991	18:46:06	36.703	75.349	261.50	9.23	2.12
13	21-Sep-1991	20:25:41	36.682	75.334	99.58	2.69	1.62
14	21-Sep-1991	22:25:26	36.681	75.317	119.75	1.52	0.76
15	22-Sep-1991	1:45:58	36.680	75.271	200.53	4.10	1.23
16	22-Sep-1991	8:50:07	36.615	75.216	424.15	8.74	1.24
17	22-Sep-1991	12:25:57	36.578	75.216	215.83	4.11	1.14
18	22-Sep-1991	14:04:52	36.564	75.180	98.92	3.57	2.17
19	22-Sep-1991	18:36:40	36.499	75.108	271.80	9.68	2.14
20	22-Sep-1991	20:16:17	36.493	75.078	99.62	2.76	1.66
21	23-Sep-1991	8:39:22	36.501	75.045	743.08	3.08	0.25
22	23-Sep-1991	12:03:16	36.501	75.019	203.90	2.32	0.68
23	23-Sep-1991	13:44:03	36.505	74.998	100.78	1.93	1.15
24	23-Sep-1991	18:22:19	36.498	74.906	278.27	8.26	1.78
25	23-Sep-1991	20:04:18	36.499	74.876	101.98	2.68	1.58
26	24-Sep-1991	1:04:22	36.485	74.836	300.07	3.90	0.78
27	24-Sep-1991	6:48:08	36.468	74.796	343.77	4.05	0.71
28	24-Sep-1991	8:28:56	36.460	74.798	100.80	0.91	0.54
29	24-Sep-1991	10:08:16	36.463	74.787	99.33	1.04	0.63
30	24-Sep-1991	11:42:17	36.455	74.767	94.02	2.00	1.28
31	24-Sep-1991	13:23:04	36.458	74.751	100.78	1.47	0.87
32	24-Sep-1991	15:03:10	36.486	74.715	100.10	4.48	2.68
33	24-Sep-1991	18:13:08	36.480	74.644	189.97	6.38	2.02
34	24-Sep-1991	19:53:51	36.470	74.593	100.72	4.69	2.80
35	24-Sep-1991	23:05:02	36.467	74.537	191.18	5.02	1.58
36	25-Sep-1991	0:44:15	36.449	74.520	99.22	2.51	1.52
37	25-Sep-1991	6:35:48	36.463	74.449	351.55	6.54	1.12
38	25-Sep-1991	8:16:36	36.492	74.424	100.80	3.92	2.34
39	25-Sep-1991	11:21:50	36.515	74.342	185.23	7.76	2.51
40	25-Sep-1991	14:40:47	36.515	74.236	198.95	9.47	2.86
41	25-Sep-1991	18:00:33	36.480	74.160	199.77	7.83	2.35
42	25-Sep-1991	19:39:52	36.468	74.137	99.32	2.45	1.48
43	25-Sep-1991	22:42:00	36.473	74.129	182.13	0.91	0.30
44	26-Sep-1991	0:21:21	36.488	74.111	99.35	2.32	1.40
45	26-Sep-1991	2:01:48	36.510	74.099	100.45	2.67	1.60
46	26-Sep-1991	6:25:28	36.580	73.983	263.67	12.96	2.95

Appendix 14. Continued.

POINT NO.	DATE	TIME (GMT)	LAT	LONG	TSLL (m)	DSLL (km)	SPEED (km/h)
47	26-Sep-1991	11:01:53	36.610	73.891	276.42	8.87	1.92
48	26-Sep-1991	12:41:54	36.596	73.859	100.02	3.25	1.95
49	26-Sep-1991	14:21:29	36.620	73.845	99.58	2.95	1.78
50	26-Sep-1991	17:48:15	36.692	73.719	206.77	13.80	4.00
51	26-Sep-1991	19:29:36	36.733	73.643	101.35	8.17	4.83
52	26-Sep-1991	22:22:40	36.799	73.558	173.07	10.54	3.66
53	26-Sep-1991	23:59:58	36.859	73.419	97.30	14.06	8.67
54	27-Sep-1991	6:12:35	37.009	73.230	372.62	23.67	3.81
55	27-Sep-1991	9:33:22	37.123	73.132	200.78	15.37	4.59
56	27-Sep-1991	12:20:40	37.246	72.935	167.30	22.17	7.95
57	27-Sep-1991	14:00:34	37.328	72.865	99.90	11.02	6.62
58	27-Sep-1991	17:37:47	37.492	72.619	217.22	28.37	7.84
59	27-Sep-1991	19:17:49	37.574	72.473	100.03	15.78	9.46
60	27-Sep-1991	20:59:07	37.638	72.372	101.30	11.39	6.75
61	27-Sep-1991	22:01:44	37.721	72.327	62.62	10.04	9.62
62	27-Sep-1991	23:41:16	37.802	72.220	99.53	13.02	7.85
63	28-Sep-1991	7:40:16	38.202	71.601	479.00	70.14	8.79
64	28-Sep-1991	9:21:24	38.282	71.492	101.13	13.03	7.73
65	28-Sep-1991	13:38:27	38.403	71.143	257.05	33.28	7.77
66	28-Sep-1991	17:27:15	38.473	70.862	228.80	25.68	6.74
67	28-Sep-1991	19:06:28	38.475	70.680	99.22	15.85	9.58
68	28-Sep-1991	20:47:28	38.472	70.534	101.00	12.72	7.55
69	28-Sep-1991	21:41:28	38.454	70.451	54.00	7.50	8.33
70	29-Sep-1991	9:09:49	38.287	69.687	688.35	69.15	6.03
71	29-Sep-1991	11:39:25	38.196	69.548	149.60	15.80	6.34
72	29-Sep-1991	13:19:33	38.136	69.456	100.13	10.45	6.26
73	29-Sep-1991	17:13:37	38.009	69.300	234.07	19.64	5.04
74	29-Sep-1991	18:54:41	37.953	69.294	101.07	6.25	3.71
75	29-Sep-1991	20:34:17	37.927	69.251	99.60	4.75	2.86
76	29-Sep-1991	22:55:19	37.857	69.205	141.03	8.77	3.73
77	30-Sep-1991	7:16:39	37.707	69.114	501.33	18.50	2.21
78	30-Sep-1991	9:00:44	37.686	69.093	104.08	2.98	1.72
79	30-Sep-1991	12:58:30	37.624	69.086	237.77	6.92	1.75
80	30-Sep-1991	17:02:00	37.526	69.121	243.50	11.32	2.79
81	30-Sep-1991	18:42:31	37.540	69.169	100.52	4.51	2.69
82	30-Sep-1991	20:24:19	37.569	69.148	101.80	3.72	2.19
83	30-Sep-1991	22:40:25	37.543	69.161	136.10	3.11	1.37
84	01-Oct-1991	0:14:20	37.547	69.149	93.92	1.15	0.73
85	01-Oct-1991	7:02:55	37.472	69.278	408.58	14.11	2.07
86	01-Oct-1991	12:36:39	37.409	69.333	333.73	8.52	1.53
87	01-Oct-1991	14:15:50	37.442	69.331	99.18	3.67	2.22
88	01-Oct-1991	16:52:36	37.419	69.460	156.77	11.68	4.47
89	01-Oct-1991	18:30:59	37.386	69.540	98.38	7.96	4.86
90	01-Oct-1991	20:11:23	37.399	69.577	100.40	3.57	2.14
91	01-Oct-1991	22:15:22	37.401	69.629	123.98	4.60	2.23
92	02-Oct-1991	12:17:18	37.418	69.910	841.93	24.89	1.77
93	02-Oct-1991	13:55:23	37.424	69.932	98.08	2.05	1.26
94	02-Oct-1991	18:20:29	37.484	69.960	265.10	7.11	1.61
95	02-Oct-1991	20:02:16	37.520	69.985	101.78	4.57	2.69
96	02-Oct-1991	21:57:24	37.551	70.010	115.13	4.09	2.13

Appendix 14. Continued.

POINT NO.	DATE	TIME (GMT)	LAT	LONG	TSLL (m)	DSLL (km)	SPEED (km/h)
97	03-Oct-1991	11:54:17	37.887	69.815	836.88	41.11	2.95
98	03-Oct-1991	13:34:30	37.935	69.766	100.22	6.85	4.10
99	03-Oct-1991	18:07:25	38.008	69.530	272.92	22.22	4.89
100	03-Oct-1991	19:50:24	38.018	69.409	102.98	10.66	6.21
101	03-Oct-1991	21:38:31	38.026	69.295	108.12	10.03	5.56
102	04-Oct-1991	0:55:31	37.939	69.070	197.00	21.97	6.69
103	04-Oct-1991	6:33:32	37.727	68.775	338.02	35.03	6.22
104	04-Oct-1991	8:10:56	37.677	68.716	97.40	7.61	4.69
105	04-Oct-1991	9:52:41	37.631	68.648	101.75	7.87	4.64
106	04-Oct-1991	11:35:01	37.592	68.613	102.33	5.32	3.12
107	04-Oct-1991	13:14:49	37.566	68.541	99.80	6.97	4.19
108	04-Oct-1991	17:55:41	37.519	68.271	280.87	24.37	5.21
109	04-Oct-1991	19:36:29	37.494	68.158	100.80	10.35	6.16
110	05-Oct-1991	9:41:18	37.377	67.480	844.82	61.27	4.35
111	05-Oct-1991	11:12:38	37.405	67.392	91.33	8.38	5.50
112	05-Oct-1991	12:54:19	37.425	67.302	101.68	8.25	4.87
113	05-Oct-1991	14:32:22	37.428	67.248	98.05	4.78	2.93
114	05-Oct-1991	17:45:46	37.506	67.041	193.40	20.22	6.27
115	05-Oct-1991	19:23:30	37.533	66.945	97.73	8.98	5.52
116	06-Oct-1991	10:50:14	37.789	66.430	926.73	53.53	3.47
117	06-Oct-1991	12:33:37	37.848	66.469	103.38	7.40	4.29
118	06-Oct-1991	14:12:25	37.894	66.391	98.80	8.55	5.19
119	06-Oct-1991	17:35:40	37.933	66.272	203.25	11.30	3.34
120	06-Oct-1991	19:13:45	37.958	66.224	98.08	5.04	3.09
121	06-Oct-1991	22:15:59	38.011	66.138	182.23	9.57	3.15
122	07-Oct-1991	5:59:16	38.084	65.923	463.28	20.50	2.66
123	07-Oct-1991	9:16:08	38.148	65.870	196.87	8.49	2.59
124	07-Oct-1991	10:31:54	38.130	65.797	75.77	6.69	5.30
125	07-Oct-1991	12:13:13	38.154	65.742	101.32	5.50	3.26
126	07-Oct-1991	13:49:45	38.151	65.661	96.53	7.09	4.41
127	07-Oct-1991	17:22:04	38.143	65.561	212.32	8.79	2.48
128	07-Oct-1991	19:01:05	38.125	65.552	99.02	2.15	1.30
129	07-Oct-1991	21:52:24	38.093	65.580	171.32	4.32	1.51
130	08-Oct-1991	1:15:19	38.087	65.633	202.92	4.69	1.39
131	08-Oct-1991	5:44:19	38.080	65.666	269.00	2.99	0.67
132	08-Oct-1991	9:07:02	38.085	65.699	202.72	2.94	0.87
133	08-Oct-1991	11:51:40	38.086	65.676	164.63	2.02	0.73
134	08-Oct-1991	13:31:27	38.085	65.660	99.78	1.40	0.84
135	08-Oct-1991	17:10:31	38.065	65.622	219.07	4.00	1.10
136	08-Oct-1991	18:50:27	38.054	65.605	99.93	1.93	1.16
137	08-Oct-1991	21:32:27	38.056	65.582	162.00	2.03	0.75
138	09-Oct-1991	7:14:15	38.055	65.556	581.80	2.28	0.24
139	09-Oct-1991	8:54:21	38.044	65.544	100.10	1.61	0.97
140	09-Oct-1991	11:31:25	38.076	65.517	157.07	4.27	1.63
141	09-Oct-1991	13:10:19	38.034	65.523	98.90	4.70	2.85
142	09-Oct-1991	16:59:08	38.031	65.558	228.82	3.08	0.81
143	09-Oct-1991	18:38:50	38.043	65.502	99.70	5.08	3.06
144	09-Oct-1991	20:19:36	38.020	65.570	100.77	6.48	3.86
145	09-Oct-1991	22:53:33	38.081	65.542	153.95	7.21	2.81
146	10-Oct-1991	8:42:49	38.131	65.519	589.27	5.91	0.60

Appendix 14. Continued.

POINT NO.	DATE	TIME (GMT)	LAT	LONG	TSLL (m)	DSLL (km)	SPEED (km/h)
147	10-Oct-1991	11:10:19	38.136	65.477	147.50	3.72	1.51
148	10-Oct-1991	12:50:26	38.140	65.459	100.12	1.64	0.98
149	10-Oct-1991	14:29:35	38.100	65.426	99.15	5.30	3.21
150	10-Oct-1991	16:49:34	38.171	65.406	139.98	8.09	3.47
151	10-Oct-1991	18:28:20	38.174	65.441	98.77	3.08	1.87
152	10-Oct-1991	20:08:43	38.202	65.379	100.38	6.25	3.74
153	11-Oct-1991	8:30:13	38.264	65.119	741.50	23.73	1.92
154	11-Oct-1991	10:48:29	38.262	65.025	138.27	8.21	3.56
155	11-Oct-1991	12:29:29	38.271	64.948	101.00	6.80	4.04
156	11-Oct-1991	14:08:04	38.282	64.898	98.58	4.53	2.76
157	11-Oct-1991	16:37:29	38.326	64.857	149.42	6.06	2.43
158	11-Oct-1991	18:16:06	38.342	64.685	98.62	15.11	9.19
159	11-Oct-1991	19:57:36	38.360	64.553	101.50	11.68	6.91
160	12-Oct-1991	6:39:02	38.249	63.835	641.43	63.86	5.97
161	12-Oct-1991	8:20:05	38.251	63.741	101.05	8.21	4.88
162	12-Oct-1991	10:26:20	38.245	63.597	126.25	12.59	5.99
163	12-Oct-1991	12:08:13	38.279	63.469	101.88	11.80	6.95
164	12-Oct-1991	13:46:33	38.299	63.366	98.33	9.26	5.65
165	12-Oct-1991	18:03:09	38.372	63.028	256.60	30.58	7.15
166	12-Oct-1991	19:44:40	38.399	62.864	101.52	14.61	8.63
167	12-Oct-1991	21:49:21	38.445	62.705	124.68	14.77	7.11
168	13-Oct-1991	6:28:37	38.694	62.269	519.27	46.94	5.42
169	13-Oct-1991	10:05:20	38.860	62.105	216.72	23.30	6.45
170	13-Oct-1991	11:48:07	38.923	62.039	102.78	9.04	5.28
171	13-Oct-1991	13:26:59	38.980	61.975	98.87	8.41	5.11
172	13-Oct-1991	17:51:17	39.049	61.748	264.30	21.06	4.78
173	13-Oct-1991	19:32:18	39.068	61.648	101.02	8.89	5.28
174	13-Oct-1991	21:24:23	39.097	61.545	112.08	9.46	5.06
175	14-Oct-1991	6:16:11	39.051	61.219	531.80	28.61	3.23
176	14-Oct-1991	7:56:14	39.031	61.144	100.05	6.85	4.11
177	14-Oct-1991	9:34:45	39.050	61.010	98.52	11.77	7.17
178	14-Oct-1991	11:25:34	39.002	61.028	110.82	5.56	3.01
179	14-Oct-1991	13:04:06	39.004	60.947	98.53	7.00	4.26
180	14-Oct-1991	16:02:35	38.985	60.774	178.48	15.10	5.08

Appendix 15. Data from loggerhead 1230 tracked via satellite in 1991. POINT NO. corresponds to number points in Figure 36. TIME in Greenwich mean time, LAT = north latitude, LONG = west longitude, TSLL = time since last location in minutes, DSLL = distance since last location in km, SPEED = speed since last location in km/h.

POINT NO.	DATE	TIME (GMT)	LAT	LONG	TSLL (m)	DSLL (km)	SPEED (km/h)
1	18-Sep-1991	17:42:21	36.705	75.890			
2	18-Sep-1991	23:26:06	36.866	75.922	343.75	18.12	3.16
3	19-Sep-1991	1:08:11	36.902	75.927	102.08	4.03	2.37
4	19-Sep-1991	7:47:20	36.975	75.990	399.15	9.86	1.48
5	19-Sep-1991	9:22:55	36.980	76.020	95.58	2.72	1.71
6	19-Sep-1991	11:47:05	37.011	76.080	144.17	6.35	2.64
7	19-Sep-1991	13:27:18	37.040	76.097	100.22	3.56	2.13
8	19-Sep-1991	15:06:05	37.017	76.113	98.78	2.93	1.78
9	19-Sep-1991	17:32:31	37.046	76.157	146.43	5.07	2.08
10	19-Sep-1991	20:50:28	37.044	76.076	197.95	7.19	2.18
11	19-Sep-1991	23:02:33	37.012	76.027	132.08	5.62	2.55
12	20-Sep-1991	7:35:50	36.979	76.176	513.28	13.73	1.61
13	20-Sep-1991	9:16:49	36.989	76.198	100.98	2.25	1.34
14	20-Sep-1991	17:19:26	37.034	76.247	482.62	6.63	0.82
15	20-Sep-1991	20:39:01	37.015	76.249	199.58	2.12	0.64
16	21-Sep-1991	0:26:18	36.995	76.256	227.28	2.31	0.61
17	21-Sep-1991	7:23:09	37.155	76.307	416.85	18.35	2.64
18	21-Sep-1991	8:59:19	37.144	76.285	96.17	2.30	1.44
19	21-Sep-1991	12:46:59	37.180	76.375	227.67	8.92	2.35
20	21-Sep-1991	14:26:10	37.193	76.382	99.18	1.57	0.95
21	22-Sep-1991	0:04:29	37.156	76.513	578.32	12.32	1.28
22	22-Sep-1991	7:11:02	37.180	76.409	426.55	9.60	1.35
23	22-Sep-1991	12:26:28	37.184	76.416	315.43	0.76	0.15
24	23-Sep-1991	1:25:52	37.168	76.382	779.40	3.50	0.27
25	23-Sep-1991	6:59:22	37.178	76.276	333.50	9.46	1.70
26	23-Sep-1991	8:39:49	37.145	76.245	100.45	4.58	2.74
27	23-Sep-1991	12:06:47	37.116	76.260	206.97	3.49	1.01
28	23-Sep-1991	13:42:02	37.109	76.232	95.25	2.60	1.64
29	23-Sep-1991	18:22:44	37.089	76.153	280.70	7.35	1.57
30	24-Sep-1991	8:24:03	36.871	75.940	841.32	30.75	2.19
31	24-Sep-1991	10:06:46	36.900	75.979	102.72	4.74	2.77
32	24-Sep-1991	11:46:37	36.896	75.957	99.85	2.01	1.21
33	24-Sep-1991	13:23:57	36.903	75.983	97.33	2.44	1.50
34	24-Sep-1991	18:09:55	36.849	75.968	285.97	6.15	1.29
35	24-Sep-1991	19:54:41	36.820	75.962	104.77	3.27	1.87
36	25-Sep-1991	18:01:39	36.635	75.837	1326.97	23.39	1.06
37	25-Sep-1991	22:42:36	36.608	75.782	280.95	5.75	1.23
38	26-Sep-1991	6:23:55	36.619	75.701	461.32	7.33	0.95
39	26-Sep-1991	9:45:59	36.637	75.682	202.07	2.62	0.78
40	26-Sep-1991	11:01:53	36.644	75.666	75.90	1.63	1.29
41	26-Sep-1991	12:43:39	36.636	75.665	101.77	0.89	0.53
42	26-Sep-1991	14:22:16	36.615	75.665	98.62	2.33	1.42
43	26-Sep-1991	17:50:24	36.574	75.673	208.13	4.61	1.33
44	26-Sep-1991	19:28:30	36.552	75.677	98.10	2.47	1.51
45	27-Sep-1991	1:41:02	36.547	75.717	372.53	3.62	0.58
46	27-Sep-1991	6:13:19	36.566	75.698	272.28	2.71	0.60

Appendix 15. Continued.

POINT NO.	DATE	TIME (GMT)	LAT	LONG	TSLL (m)	DSLL (km)	SPEED (km/h)
47	27-Sep-1991	7:53:41	36.563	75.696	100.37	0.38	0.23
48	27-Sep-1991	12:22:52	36.560	75.682	269.18	1.29	0.29
49	27-Sep-1991	14:02:42	36.537	75.689	99.83	2.63	1.58
50	27-Sep-1991	17:38:20	36.573	75.710	215.63	4.42	1.23
51	27-Sep-1991	19:16:03	36.572	75.664	97.72	4.11	2.52
52	27-Sep-1991	20:59:29	36.581	75.677	103.43	1.53	0.89
53	27-Sep-1991	22:01:09	36.572	75.679	61.67	1.02	0.99
54	28-Sep-1991	7:42:07	36.584	75.669	580.97	1.61	0.17
55	28-Sep-1991	9:22:11	36.576	75.669	100.07	0.89	0.53
56	28-Sep-1991	13:42:13	36.598	75.673	260.03	2.47	0.57
57	28-Sep-1991	17:27:38	36.626	75.657	225.42	3.42	0.91
58	28-Sep-1991	19:05:43	36.638	75.673	98.08	1.95	1.20
59	28-Sep-1991	20:47:15	36.647	75.656	101.53	1.82	1.07
60	28-Sep-1991	23:24:50	36.665	75.623	157.58	3.56	1.36
61	29-Sep-1991	7:30:15	36.689	75.596	485.42	3.59	0.44
62	29-Sep-1991	9:10:58	36.689	75.594	100.72	0.18	0.11
63	29-Sep-1991	11:37:47	36.696	75.588	146.82	0.94	0.39
64	29-Sep-1991	13:19:43	36.708	75.563	101.93	2.60	1.53
65	29-Sep-1991	14:57:54	36.725	75.591	98.18	3.13	1.91
66	29-Sep-1991	17:15:45	36.734	75.571	137.85	2.04	0.89
67	29-Sep-1991	20:33:30	36.780	75.532	197.75	6.18	1.88
68	30-Sep-1991	8:59:04	36.872	75.439	745.57	13.16	1.06
69	30-Sep-1991	11:18:24	36.879	75.405	139.33	3.12	1.35
70	30-Sep-1991	14:37:27	36.874	75.393	199.05	1.20	0.36
71	30-Sep-1991	17:04:22	36.899	75.403	146.92	2.92	1.19
72	30-Sep-1991	18:46:06	36.891	75.372	101.73	2.90	1.71
73	30-Sep-1991	20:25:08	36.842	75.424	99.03	7.15	4.33
74	01-Oct-1991	0:15:41	36.890	75.401	230.55	5.72	1.49
75	01-Oct-1991	1:58:52	36.891	75.417	103.18	1.43	0.83
76	01-Oct-1991	7:07:01	36.889	75.454	308.15	3.30	0.64
77	01-Oct-1991	8:44:10	36.900	75.457	97.15	1.25	0.77
78	01-Oct-1991	10:27:08	36.886	75.443	102.97	1.99	1.16
79	01-Oct-1991	10:57:35	36.896	75.429	30.45	1.67	3.29
80	01-Oct-1991	14:20:09	36.904	75.303	202.57	11.24	3.33
81	01-Oct-1991	18:30:46	36.936	75.435	250.62	12.26	2.94
82	01-Oct-1991	20:11:29	36.950	75.423	100.72	1.89	1.12
83	01-Oct-1991	22:18:57	36.959	75.441	127.47	1.89	0.89
84	02-Oct-1991	1:36:38	36.969	75.391	197.68	4.58	1.39
85	02-Oct-1991	6:56:21	37.013	75.357	319.72	5.75	1.08
86	02-Oct-1991	8:36:23	37.027	75.351	100.03	1.65	0.99
87	02-Oct-1991	10:15:47	37.022	75.359	99.40	0.90	0.54
88	02-Oct-1991	20:00:33	37.101	75.294	584.77	10.51	1.08
89	02-Oct-1991	21:58:50	37.128	75.344	118.28	5.35	2.72
90	03-Oct-1991	1:18:11	37.118	75.323	199.35	2.17	0.65
91	03-Oct-1991	6:43:07	37.120	75.363	324.93	3.55	0.66
92	03-Oct-1991	10:04:11	37.115	75.393	201.07	2.72	0.81
93	03-Oct-1991	13:37:54	37.118	75.398	213.72	0.56	0.16
94	03-Oct-1991	18:07:18	37.135	75.433	269.40	3.63	0.81
95	03-Oct-1991	19:50:06	37.148	75.434	102.80	1.45	0.85
96	04-Oct-1991	0:55:50	37.173	75.426	305.73	2.87	0.56

Appendix 15. Continued.

POINT NO.	DATE	TIME (GMT)	LAT	LONG	TSLL (m)	DSLL (km)	SPEED (km/h)
97	04-Oct-1991	6:31:59	37.168	75.445	336.15	1.77	0.32
98	04-Oct-1991	9:53:21	37.168	75.453	201.37	0.71	0.21
99	04-Oct-1991	13:16:07	37.177	75.413	202.77	3.68	1.09
100	04-Oct-1991	17:57:23	37.226	75.412	281.27	5.45	1.16
101	04-Oct-1991	19:37:07	37.242	75.394	99.73	2.39	1.44
102	05-Oct-1991	0:35:37	37.277	75.357	298.50	5.09	1.02
103	05-Oct-1991	6:19:56	37.273	75.350	344.32	0.76	0.13
104	05-Oct-1991	8:00:40	37.270	75.358	100.73	0.78	0.47
105	05-Oct-1991	9:41:08	37.270	75.365	100.47	0.62	0.37
106	05-Oct-1991	12:54:22	37.280	75.384	193.23	2.02	0.63
107	05-Oct-1991	14:32:41	37.289	75.343	98.32	3.76	2.30
108	05-Oct-1991	17:46:11	37.303	75.315	193.50	2.93	0.91
109	05-Oct-1991	19:25:01	37.311	75.288	98.83	2.55	1.55
110	06-Oct-1991	0:14:42	37.351	75.248	289.68	5.68	1.18
111	06-Oct-1991	1:55:08	37.364	75.246	100.43	1.46	0.87
112	06-Oct-1991	6:07:07	37.349	75.205	251.98	3.99	0.95
113	06-Oct-1991	7:49:43	37.361	75.222	102.60	2.01	1.18
114	06-Oct-1991	9:30:04	37.367	75.230	100.35	0.97	0.58
115	06-Oct-1991	12:33:43	37.383	75.216	183.65	2.17	0.71
116	06-Oct-1991	17:34:00	37.380	75.200	300.28	1.45	0.29
117	06-Oct-1991	23:53:16	37.360	75.242	379.27	4.33	0.68
118	07-Oct-1991	7:38:03	37.285	75.261	464.78	8.51	1.10
119	07-Oct-1991	9:18:26	37.263	75.281	100.38	3.02	1.80
120	07-Oct-1991	12:13:15	37.266	75.293	174.82	1.11	0.38
121	07-Oct-1991	13:55:52	37.280	75.253	102.62	3.87	2.26
122	07-Oct-1991	17:23:08	37.301	75.283	207.27	3.53	1.02
123	07-Oct-1991	19:01:56	37.219	75.361	98.80	11.44	6.94
124	07-Oct-1991	23:33:25	37.274	75.228	271.48	13.27	2.93
125	08-Oct-1991	7:27:26	37.241	75.210	474.02	4.00	0.51
126	08-Oct-1991	13:29:39	37.249	75.188	362.22	2.14	0.35
127	08-Oct-1991	18:49:38	37.214	75.155	319.98	4.87	0.91
128	08-Oct-1991	23:11:13	37.216	75.106	261.58	4.34	1.00
129	09-Oct-1991	0:51:55	37.218	75.117	100.70	1.00	0.60
130	09-Oct-1991	7:14:24	37.215	75.105	382.48	1.11	0.17
131	09-Oct-1991	8:51:15	37.225	75.077	96.85	2.72	1.68
132	09-Oct-1991	11:30:09	37.220	75.115	158.90	3.41	1.29
133	09-Oct-1991	20:24:04	37.221	74.993	533.92	10.80	1.21
134	09-Oct-1991	22:54:14	37.207	75.100	150.17	9.60	3.84
135	10-Oct-1991	0:31:20	37.252	75.069	97.10	5.71	3.53
136	10-Oct-1991	7:05:41	37.306	75.029	394.35	6.97	1.06
137	10-Oct-1991	8:43:55	37.280	75.066	98.23	4.37	2.67
138	10-Oct-1991	10:21:46	37.290	75.073	97.85	1.27	0.78
139	10-Oct-1991	11:09:06	37.287	75.065	47.33	0.78	0.99
140	10-Oct-1991	12:47:58	37.296	75.110	98.87	4.11	2.49
141	10-Oct-1991	14:30:07	37.294	75.096	102.15	1.26	0.74
142	10-Oct-1991	18:26:53	37.311	75.091	236.77	1.94	0.49
143	10-Oct-1991	20:07:50	37.326	75.077	100.95	2.08	1.23
144	11-Oct-1991	0:09:44	37.326	75.097	241.90	1.77	0.44
145	11-Oct-1991	1:50:49	37.331	75.119	101.08	2.02	1.20
146	11-Oct-1991	6:50:58	37.331	75.099	300.15	1.77	0.35

Appendix 15. Continued.

POINT NO.	DATE	TIME (GMT)	LAT	LONG	TSLI (m)	DSLII (km)	SPEED (km/h)
147	11-Oct-1991	8:31:18	37.331	75.098	100.33	0.09	0.05
148	11-Oct-1991	10:12:00	37.336	75.102	100.70	0.66	0.39
149	11-Oct-1991	18:15:52	37.386	75.088	483.87	5.70	0.71
150	11-Oct-1991	23:49:11	37.402	75.091	333.32	1.80	0.32
151	12-Oct-1991	1:30:17	37.401	75.089	101.10	0.21	0.12
152	12-Oct-1991	6:39:35	37.396	75.074	309.30	1.44	0.28
153	12-Oct-1991	8:20:39	37.391	75.070	101.07	0.66	0.39
154	12-Oct-1991	10:01:02	37.385	75.079	100.38	1.04	0.62
155	12-Oct-1991	12:09:36	37.393	75.098	128.57	1.90	0.89
156	12-Oct-1991	18:04:14	37.409	75.114	354.63	2.27	0.38
157	12-Oct-1991	21:50:03	37.372	75.088	225.82	4.71	1.25

Appendix 16. Data from loggerhead 1231 tracked via satellite in 1991. POINT NO. corresponds to number points in Figure 37. TIME in Greenwich mean time, LAT = north latitude, LONG = west longitude, TSLL = time since last location in minutes, DSLL = distance since last location in km, SPEED = speed since last location in km/h.

POINT NO.	DATE	TIME (GMT)	LAT	LONG	TSLL (m)	DSLL (km)	SPEED (km/h)
1	19-Sep-1991	11:46:50	36.827	75.666			
2	20-Sep-1991	7:31:35	36.758	75.655	1184.75	7.73	0.39
3	21-Sep-1991	7:24:57	36.243	75.471	1433.37	59.57	2.49
4	21-Sep-1991	18:40:23	35.958	75.175	675.43	41.37	3.67
5	22-Sep-1991	20:13:08	35.775	75.553	1532.75	39.68	1.55
6	26-Sep-1991	9:48:55	35.673	75.705	5135.78	17.80	0.21
7	26-Sep-1991	14:23:55	35.638	75.657	275.00	5.83	1.27
8	26-Sep-1991	19:29:00	35.620	75.633	305.08	2.95	0.58
9	26-Sep-1991	21:10:12	35.614	75.655	101.20	2.10	1.24
10	27-Sep-1991	9:33:28	35.564	75.663	743.27	5.61	0.45
11	27-Sep-1991	12:15:33	35.621	75.559	162.08	11.34	4.20
12	27-Sep-1991	17:37:30	35.531	75.707	321.95	16.71	3.11
13	28-Sep-1991	9:22:05	35.664	75.634	944.58	16.19	1.03
14	29-Sep-1991	14:57:56	35.654	75.553	1775.85	7.40	0.25
15	29-Sep-1991	22:59:43	35.565	75.783	481.78	23.03	2.87
16	30-Sep-1991	8:55:13	35.593	75.771	595.50	3.30	0.33
17	30-Sep-1991	18:42:42	35.546	75.828	587.48	7.34	0.75
18	30-Sep-1991	20:24:03	35.547	75.836	101.35	0.73	0.43
19	01-Oct-1991	8:48:08	35.545	75.848	744.08	1.11	0.09
20	01-Oct-1991	12:38:25	35.539	75.862	230.28	1.43	0.37
21	02-Oct-1991	0:02:03	35.391	76.067	683.63	24.81	2.18
22	02-Oct-1991	6:56:44	35.537	75.862	414.68	24.66	3.57
23	02-Oct-1991	10:14:38	35.516	75.884	197.90	3.07	0.93
24	02-Oct-1991	13:58:13	35.503	75.838	223.58	4.41	1.18
25	03-Oct-1991	6:43:13	35.549	75.794	1005.00	6.48	0.39
26	03-Oct-1991	11:55:45	35.539	75.841	312.53	4.40	0.84
27	03-Oct-1991	13:37:22	35.509	75.850	101.62	3.43	2.03
28	03-Oct-1991	18:07:49	35.473	75.892	270.45	5.52	1.22
29	03-Oct-1991	19:47:24	35.469	75.896	99.58	0.57	0.35
30	04-Oct-1991	0:56:49	35.455	75.917	309.42	2.46	0.48
31	04-Oct-1991	11:38:21	35.475	75.846	641.53	6.80	0.64
32	04-Oct-1991	14:54:04	35.465	75.836	195.72	1.43	0.44
33	04-Oct-1991	17:56:53	35.406	75.973	182.82	14.04	4.61
34	04-Oct-1991	19:36:58	35.426	75.969	100.08	2.25	1.35
35	04-Oct-1991	21:17:53	35.389	75.961	100.92	4.18	2.48

Appendix 17. Data from loggerhead 1233 tracked via satellite in 1991. POINT NO. corresponds to number points in Figure 38. TIME in Greenwich mean time, LAT = north latitude, LONG = west longitude, TSLL = time since last location in minutes, DSLL = distance since last location in km, SPEED = speed since last location in km/h.

POINT NO.	DATE	TIME (GMT)	LAT	LONG	TSLL (m)	DSLL (km)	SPEED (km/h)
1	18-Sep-1991	13:46:23	36.789	75.920			
2	19-Sep-1991	11:46:33	36.775	75.935	1320.17	2.05	0.09
3	19-Sep-1991	13:26:55	36.791	75.930	100.37	1.83	1.10
4	19-Sep-1991	15:04:59	36.807	75.913	98.07	2.34	1.43
5	19-Sep-1991	19:09:06	36.833	75.894	244.12	3.35	0.82
6	19-Sep-1991	23:06:39	36.904	75.809	237.55	10.93	2.76
7	20-Sep-1991	7:33:57	36.874	75.848	507.30	4.81	0.57
8	20-Sep-1991	9:16:22	36.885	75.891	102.42	4.02	2.35
9	20-Sep-1991	13:08:45	36.903	75.927	232.38	3.78	0.97
10	20-Sep-1991	17:19:54	36.904	75.906	251.15	1.87	0.45
11	20-Sep-1991	18:58:23	36.890	75.907	98.48	1.56	0.95
12	20-Sep-1991	20:39:55	36.883	75.907	101.53	0.78	0.46
13	20-Sep-1991	22:46:38	36.907	75.936	126.72	3.71	1.76
14	21-Sep-1991	12:45:14	36.956	75.958	838.60	5.79	0.41
15	21-Sep-1991	14:25:03	36.956	75.953	99.82	0.44	0.27
16	21-Sep-1991	18:42:41	36.925	75.906	257.63	5.42	1.26
17	21-Sep-1991	20:27:31	36.933	75.834	104.83	6.46	3.70
18	21-Sep-1991	22:23:59	36.930	75.856	116.47	1.98	1.02
19	22-Sep-1991	7:12:08	36.930	75.804	528.15	4.62	0.53
20	22-Sep-1991	12:25:42	36.934	75.798	313.57	0.69	0.13
21	22-Sep-1991	14:04:49	36.932	75.781	99.12	1.53	0.92
22	22-Sep-1991	18:35:15	36.920	75.753	270.43	2.82	0.63
23	22-Sep-1991	20:16:46	36.922	75.747	101.52	0.58	0.34
24	23-Sep-1991	1:24:55	36.953	75.748	308.15	3.45	0.67
25	23-Sep-1991	12:04:02	36.979	75.761	639.12	3.11	0.29
26	23-Sep-1991	13:45:02	36.981	75.760	101.00	0.24	0.14
27	23-Sep-1991	18:22:41	36.974	75.746	277.65	1.47	0.32
28	23-Sep-1991	20:03:23	36.968	75.716	100.70	2.75	1.64
29	24-Sep-1991	8:28:27	36.960	75.672	745.07	4.01	0.32
30	24-Sep-1991	11:43:28	36.962	75.677	195.02	0.50	0.15
31	24-Sep-1991	13:23:53	36.957	75.677	100.42	0.56	0.33
32	24-Sep-1991	15:01:49	36.964	75.684	97.93	1.00	0.61
33	24-Sep-1991	19:53:08	36.927	75.668	291.32	4.35	0.90
34	25-Sep-1991	11:22:17	36.907	75.706	929.15	4.04	0.26
35	25-Sep-1991	14:42:38	36.888	75.715	200.35	2.26	0.68
36	25-Sep-1991	19:40:07	36.868	75.671	297.48	4.50	0.91
37	26-Sep-1991	11:01:19	36.865	75.591	921.20	7.12	0.46
38	26-Sep-1991	12:38:13	36.850	75.546	96.90	4.34	2.69
39	26-Sep-1991	14:21:31	36.843	75.601	103.30	4.96	2.88
40	26-Sep-1991	17:48:30	36.831	75.593	206.98	1.51	0.44
41	26-Sep-1991	19:28:49	36.799	75.562	100.32	4.50	2.69
42	26-Sep-1991	21:11:21	36.764	75.587	102.53	4.48	2.62
43	26-Sep-1991	22:22:09	36.778	75.572	70.80	2.05	1.74
44	27-Sep-1991	7:53:57	36.757	75.550	571.80	3.05	0.32
45	27-Sep-1991	9:33:30	36.745	75.543	99.55	1.47	0.89
46	27-Sep-1991	12:19:44	36.735	75.562	166.23	2.03	0.73

Appendix 17. Continued.

POINT NO.	DATE	TIME (GMT)	LAT	LONG	TSLL (m)	DSLL (km)	SPEED (km/h)
47	27-Sep-1991	14:01:01	36.719	75.561	101.28	1.78	1.06
48	27-Sep-1991	19:16:09	36.670	75.610	315.13	6.98	1.33
49	27-Sep-1991	20:59:24	36.680	75.540	103.25	6.34	3.69
50	27-Sep-1991	22:00:03	36.658	75.546	60.65	2.50	2.48
51	28-Sep-1991	1:16:51	36.638	75.657	196.80	10.15	3.09
52	28-Sep-1991	7:42:04	36.636	75.539	385.22	10.53	1.64
53	28-Sep-1991	9:22:44	36.622	75.536	100.67	1.58	0.94
54	28-Sep-1991	13:40:21	36.617	75.537	257.62	0.56	0.13
55	28-Sep-1991	15:19:16	36.587	75.543	98.92	3.38	2.05
56	28-Sep-1991	17:26:21	36.624	75.547	127.08	4.13	1.95
57	28-Sep-1991	19:06:28	36.617	75.545	100.12	0.80	0.48
58	29-Sep-1991	9:06:05	36.574	75.442	839.62	10.36	0.74
59	29-Sep-1991	11:39:02	36.586	75.492	152.95	4.66	1.83
60	29-Sep-1991	13:19:07	36.585	75.487	100.08	0.46	0.28
61	29-Sep-1991	14:58:43	36.582	75.491	99.60	0.49	0.29
62	29-Sep-1991	17:14:48	36.580	75.491	136.08	0.22	0.10
63	29-Sep-1991	18:54:12	36.616	75.504	99.40	4.17	2.52
64	29-Sep-1991	20:36:59	36.617	75.489	102.78	1.34	0.78
65	30-Sep-1991	7:21:03	36.619	75.522	644.07	2.95	0.28
66	30-Sep-1991	14:37:19	36.598	75.492	436.27	3.55	0.49
67	30-Sep-1991	17:03:24	36.612	75.463	146.08	3.02	1.24
68	30-Sep-1991	18:42:59	36.596	75.461	99.58	1.79	1.08
69	30-Sep-1991	20:23:18	36.578	75.439	100.32	2.80	1.68
70	30-Sep-1991	22:39:26	36.545	75.430	136.13	3.76	1.66
71	01-Oct-1991	0:20:08	36.538	75.422	100.70	1.06	0.63
72	01-Oct-1991	8:53:33	36.490	75.519	513.42	10.18	1.19
73	01-Oct-1991	12:37:34	36.493	75.437	224.02	7.34	1.97
74	01-Oct-1991	14:16:49	36.478	75.432	99.25	1.73	1.04
75	01-Oct-1991	18:31:17	36.463	75.463	254.47	3.24	0.76
76	01-Oct-1991	20:09:42	36.454	75.444	98.42	1.97	1.20
77	01-Oct-1991	22:16:44	36.424	75.476	127.03	4.40	2.08
78	02-Oct-1991	7:00:08	36.389	75.333	523.40	13.38	1.53
79	02-Oct-1991	12:17:39	36.433	75.495	317.52	15.30	2.89
80	02-Oct-1991	13:56:20	36.419	75.495	98.68	1.56	0.95
81	02-Oct-1991	18:18:24	36.419	75.546	262.07	4.56	1.04
82	02-Oct-1991	19:59:41	36.418	75.557	101.28	0.99	0.59
83	03-Oct-1991	1:15:38	36.410	75.568	315.95	1.33	0.25
84	03-Oct-1991	11:56:51	36.385	75.608	641.22	4.53	0.42
85	03-Oct-1991	13:36:58	36.351	75.583	100.12	4.39	2.63
86	03-Oct-1991	18:08:22	36.297	75.595	271.40	6.10	1.35
87	03-Oct-1991	19:48:39	36.282	75.590	100.28	1.73	1.03
88	03-Oct-1991	23:13:54	36.259	75.585	205.25	2.60	0.76
89	04-Oct-1991	11:35:31	36.186	75.529	741.62	9.54	0.77
90	04-Oct-1991	13:11:33	36.221	75.581	96.03	6.08	3.80
91	04-Oct-1991	17:55:42	36.128	75.452	284.15	15.52	3.28
92	04-Oct-1991	19:37:36	36.124	75.426	101.90	2.38	1.40
93	05-Oct-1991	6:19:50	36.139	75.391	642.23	3.56	0.33
94	05-Oct-1991	11:14:28	36.138	75.385	294.63	0.55	0.11
95	05-Oct-1991	12:54:59	36.160	75.454	100.52	6.66	3.98
96	05-Oct-1991	17:44:54	36.134	75.340	289.92	10.64	2.20

Appendix 17. Continued.

POINT NO.	DATE	TIME (GMT)	LAT	LONG	TSLL (m)	DSLL (km)	SPEED (km/h)
97	05-Oct-1991	22:31:44	36.134	75.296	286.83	3.95	0.83
98	06-Oct-1991	0:16:13	36.141	75.278	104.48	1.79	1.03
99	06-Oct-1991	7:54:27	36.128	75.259	458.23	2.24	0.29
100	06-Oct-1991	12:36:02	36.136	75.258	281.58	0.89	0.19
101	06-Oct-1991	14:13:40	36.131	75.233	97.63	2.31	1.42
102	06-Oct-1991	17:34:22	36.108	75.192	200.70	4.48	1.34
103	06-Oct-1991	19:11:53	36.079	75.202	97.52	3.35	2.06
104	07-Oct-1991	12:14:19	35.981	75.176	1022.43	11.14	0.65
105	07-Oct-1991	13:54:58	35.967	75.156	100.65	2.38	1.42
106	07-Oct-1991	19:01:39	35.912	75.108	306.68	7.49	1.46
107	07-Oct-1991	23:32:46	35.874	75.116	271.12	4.29	0.95
108	08-Oct-1991	1:12:22	35.869	75.117	99.60	0.56	0.34
109	08-Oct-1991	9:07:42	35.854	75.109	475.33	1.82	0.23
110	08-Oct-1991	11:52:51	35.840	75.125	165.15	2.12	0.77
111	08-Oct-1991	13:33:01	35.848	75.125	100.17	0.89	0.53
112	08-Oct-1991	20:28:28	35.845	75.091	415.45	3.08	0.45
113	08-Oct-1991	23:10:31	35.859	75.112	162.05	2.45	0.91
114	09-Oct-1991	13:11:51	35.866	75.109	841.33	0.82	0.06
115	09-Oct-1991	18:39:10	35.900	75.067	327.32	5.35	0.98
116	09-Oct-1991	20:21:11	35.906	75.047	102.02	1.92	1.13
117	10-Oct-1991	2:11:43	35.890	75.056	350.53	1.95	0.33
118	10-Oct-1991	7:03:47	35.912	75.033	292.07	3.21	0.66
119	10-Oct-1991	8:38:40	35.884	75.025	94.88	3.20	2.02
120	10-Oct-1991	10:24:08	35.917	74.995	105.47	4.56	2.59
121	10-Oct-1991	14:30:37	35.926	75.000	246.48	1.10	0.27
122	10-Oct-1991	18:29:24	35.934	74.958	238.78	3.89	0.98
123	10-Oct-1991	20:08:43	35.930	74.926	99.32	2.92	1.76
124	11-Oct-1991	6:54:03	35.879	74.836	645.33	9.89	0.92
125	11-Oct-1991	10:12:01	35.861	74.808	197.97	3.22	0.98
126	11-Oct-1991	12:29:46	35.844	74.789	137.75	2.55	1.11
127	11-Oct-1991	14:09:22	35.839	74.766	99.60	2.15	1.29
128	11-Oct-1991	18:16:29	35.827	74.704	247.12	5.75	1.40
129	11-Oct-1991	19:55:01	35.833	74.676	98.53	2.61	1.59
130	12-Oct-1991	6:42:14	35.845	74.585	647.22	8.31	0.77
131	12-Oct-1991	10:00:28	35.864	74.558	198.23	3.22	0.98
132	12-Oct-1991	12:08:29	35.909	74.479	128.02	8.70	4.08
133	12-Oct-1991	13:48:31	35.965	74.401	100.03	9.39	5.63
134	12-Oct-1991	18:04:01	36.198	74.156	255.50	34.00	7.98
135	12-Oct-1991	19:45:32	36.279	74.034	101.52	14.17	8.38
136	12-Oct-1991	21:49:39	36.387	73.932	124.12	15.09	7.29
137	13-Oct-1991	6:30:46	36.718	73.462	521.12	55.83	6.43
138	13-Oct-1991	11:48:15	36.950	73.097	317.48	41.48	7.84
139	13-Oct-1991	13:28:22	37.054	73.025	100.12	13.21	7.92
140	13-Oct-1991	17:54:15	37.287	72.774	265.88	34.14	7.70
141	13-Oct-1991	19:32:30	37.367	72.673	98.25	12.61	7.70
142	14-Oct-1991	0:52:20	37.649	72.512	319.83	34.42	6.46
143	14-Oct-1991	9:39:25	38.061	72.238	527.08	51.74	5.89
144	14-Oct-1991	11:24:48	38.132	72.147	105.38	11.21	6.38
145	14-Oct-1991	13:06:31	38.205	72.107	101.72	8.84	5.21
146	14-Oct-1991	17:41:36	38.342	71.908	275.08	23.11	5.04

Appendix 17. Continued.

POINT NO.	DATE	TIME (GMT)	LAT	LONG	TSLL (m)	DSLL (km)	SPEED (km/h)
147	14-Oct-1991	19:22:17	38.373	71.777	100.68	11.93	7.11
148	16-Oct-1991	9:12:59	38.167	69.121	2270.70	233.02	6.16
149	16-Oct-1991	12:24:49	38.107	68.904	191.83	20.12	6.29
150	16-Oct-1991	14:04:13	38.101	68.781	99.40	10.78	6.51
151	16-Oct-1991	17:16:48	38.076	68.558	192.58	19.72	6.14
152	16-Oct-1991	18:58:49	38.047	68.405	102.02	13.78	8.10
153	16-Oct-1991	22:02:31	37.984	68.163	183.70	22.33	7.29
154	16-Oct-1991	23:43:35	37.902	68.131	101.07	9.54	5.66
155	17-Oct-1991	1:25:49	37.842	68.033	102.23	10.89	6.39

Appendix 18. Data from loggerhead 1234 tracked via satellite in 1991. POINT NO. corresponds to number points in Figure 39. TIME in Greenwich mean time, LAT = north latitude, LONG = west longitude, TSSL = time since last location in minutes, DSSL = distance since last location in km, SPEED = speed since last location in km/h.

POINT NO.	DATE	TIME (GMT)	LAT	LONG	TSSL (m)	DSSL (km)	SPEED (km/h)
1	19-Sep-1991	11:47:48	36.729	75.922			
2	19-Sep-1991	13:25:26	36.748	75.911	97.63	2.33	1.43
3	19-Sep-1991	15:06:29	36.787	75.879	101.05	5.19	3.08
4	19-Sep-1991	17:30:23	36.758	75.856	143.90	3.82	1.59
5	19-Sep-1991	20:49:51	36.814	75.896	199.47	7.17	2.16
6	19-Sep-1991	23:06:45	36.798	75.903	136.90	1.88	0.83
7	20-Sep-1991	7:32:35	36.752	75.883	505.83	5.42	0.64
8	20-Sep-1991	11:26:13	36.683	75.823	233.63	9.35	2.40
9	20-Sep-1991	13:05:57	36.610	75.741	99.73	10.93	6.57
10	20-Sep-1991	14:44:40	36.580	75.754	98.72	3.53	2.15
11	20-Sep-1991	18:58:12	36.493	75.737	253.53	9.79	2.32
12	20-Sep-1991	20:40:28	36.463	75.730	102.27	3.39	1.99
13	20-Sep-1991	22:45:18	36.432	75.725	124.83	3.48	1.67
14	21-Sep-1991	12:45:49	36.368	75.731	840.52	7.14	0.51
15	21-Sep-1991	14:25:19	36.342	75.733	99.50	2.90	1.75
16	21-Sep-1991	20:28:31	36.234	75.769	363.20	12.43	2.05
17	21-Sep-1991	22:25:57	36.194	75.739	117.43	5.20	2.66
18	22-Sep-1991	14:04:42	36.098	75.678	938.75	12.00	0.77
19	22-Sep-1991	20:16:21	35.983	75.625	371.65	13.64	2.20
20	23-Sep-1991	6:58:18	35.947	75.600	641.95	4.59	0.43
21	23-Sep-1991	8:38:36	35.896	75.566	100.30	6.44	3.85
22	23-Sep-1991	12:03:09	35.880	75.553	204.55	2.13	0.62
23	23-Sep-1991	13:41:23	35.876	75.533	98.23	1.86	1.13
24	23-Sep-1991	18:21:46	35.864	75.488	280.38	4.27	0.91
25	23-Sep-1991	20:03:50	35.860	75.454	102.07	3.10	1.82
26	24-Sep-1991	6:44:01	35.866	75.395	640.18	5.36	0.50
27	24-Sep-1991	11:43:26	35.870	75.432	299.42	3.36	0.67
28	24-Sep-1991	13:25:50	35.865	75.429	102.40	0.62	0.36
29	24-Sep-1991	18:11:27	35.828	75.428	285.62	4.11	0.86
30	24-Sep-1991	19:52:13	35.822	75.417	100.77	1.20	0.71
31	25-Sep-1991	6:35:12	35.805	75.470	642.98	5.14	0.48

Appendix 19. Data from loggerhead 4936 tracked via satellite in 1991. POINT NO. corresponds to number points in Figure 40. TIME in Greenwich mean time, LAT = north latitude, LONG = west longitude, TSLL = time since last location in minutes, DSLL = distance since last location in km, SPEED = speed since last location in km/h.

POINT NO.	DATE	TIME (GMT)	LAT	LONG	TSLL (m)	DSLL (km)	SPEED (km/h)
1	23-Oct-1991	17:38:28	36.617	75.827			
2	23-Oct-1991	20:55:45	36.665	75.798	197.28	5.93	1.80
3	23-Oct-1991	22:59:11	36.706	75.778	123.43	4.89	2.38
4	24-Oct-1991	0:38:28	36.685	75.730	99.28	4.88	2.95
5	24-Oct-1991	7:43:34	36.701	75.657	425.10	6.75	0.95
6	24-Oct-1991	9:22:48	36.680	75.623	99.23	3.83	2.31
7	24-Oct-1991	11:18:23	36.673	75.636	115.58	1.40	0.72
8	24-Oct-1991	12:58:29	36.671	75.662	100.10	2.33	1.40
9	24-Oct-1991	14:38:39	36.662	75.686	100.17	2.36	1.42
10	24-Oct-1991	17:27: 1	36.641	75.775	168.37	8.28	2.95
11	24-Oct-1991	19: 5: 7	36.639	75.732	98.10	3.84	2.35
12	24-Oct-1991	20:45:41	36.642	75.769	100.57	3.32	1.98
13	24-Oct-1991	22:39: 9	36.630	75.840	113.47	6.47	3.42
14	25-Oct-1991	0:20:56	36.664	75.832	101.78	3.85	2.27
15	25-Oct-1991	2: 0:18	36.674	75.817	99.37	1.74	1.05
16	25-Oct-1991	7:26:35	36.701	75.883	326.28	6.61	1.21
17	25-Oct-1991	9:11:41	36.708	75.841	105.10	3.82	2.18
18	25-Oct-1991	12:38:51	36.720	75.909	207.17	6.21	1.80
19	25-Oct-1991	17:15:40	36.689	75.863	276.82	5.36	1.16
20	25-Oct-1991	20:33:32	36.655	75.862	197.87	3.78	1.15
21	26-Oct-1991	7:17:28	36.564	75.759	643.93	13.67	1.27
22	26-Oct-1991	9: 1:18	36.550	75.752	103.83	1.68	0.97
23	26-Oct-1991	12:17:38	36.567	75.747	196.33	1.94	0.59
24	26-Oct-1991	13:57:15	36.585	75.760	99.62	2.31	1.39
25	26-Oct-1991	18:41:15	36.631	75.833	284.00	8.28	1.75
26	27-Oct-1991	1:15:33	36.583	75.842	394.30	5.40	0.82
27	27-Oct-1991	13:35:48	36.565	75.850	740.25	2.12	0.17
28	27-Oct-1991	20:12:42	36.634	75.876	396.90	8.01	1.21
29	27-Oct-1991	23:13:31	36.690	75.867	180.82	6.28	2.08
30	28-Oct-1991	6:55:52	36.724	75.913	462.35	5.58	0.72
31	28-Oct-1991	8:36: 9	36.719	75.840	100.28	6.53	3.91
32	28-Oct-1991	13:16:27	36.741	75.869	280.30	3.56	0.76
33	29-Oct-1991	14:33:29	36.794	75.843	1517.03	6.33	0.25
34	29-Oct-1991	22:36:11	36.708	75.887	482.70	10.33	1.28
35	30-Oct-1991	22:14:10	36.614	75.844	1417.98	11.13	0.47
36	31-Oct-1991	1:36: 7	36.562	75.718	201.95	12.65	3.76
37	31-Oct-1991	6:20:10	36.395	75.743	284.05	18.70	3.95
38	31-Oct-1991	9:43:38	36.400	75.725	203.47	1.70	0.50
39	31-Oct-1991	12:13:36	36.389	75.750	149.97	2.55	1.02
40	31-Oct-1991	13:53:49	36.374	75.702	100.22	4.61	2.76
41	31-Oct-1991	17:45:22	36.266	75.652	231.55	12.82	3.32
42	31-Oct-1991	19:23:27	36.290	75.731	98.08	7.57	4.63
43	31-Oct-1991	21: 5:27	36.264	75.710	102.00	3.45	2.03
44	1-Nov-1991	1:11:52	36.140	75.663	246.42	14.42	3.51
45	1-Nov-1991	7:48:28	36.101	75.670	396.60	4.38	0.66
46	1-Nov-1991	13:32:51	36.049	75.613	344.38	7.72	1.35

Appendix 19. Continued.

POINT NO.	DATE	TIME (GMT)	LAT	LONG	TSLL (m)	DSLL (km)	SPEED (km/h)
47	1-Nov-1991	19:12:3	36.037	75.595	339.20	2.10	0.37
48	1-Nov-1991	20:54:23	36.073	75.620	102.33	4.59	2.69
49	2-Nov-1991	0:52:55	36.020	75.635	238.53	6.04	1.52
50	2-Nov-1991	7:39:54	36.088	75.680	406.98	8.57	1.26
51	2-Nov-1991	13:10:26	36.118	75.645	330.53	4.58	0.83
52	2-Nov-1991	14:49:57	36.205	75.587	99.52	10.99	6.62
53	2-Nov-1991	20:42:55	36.205	75.686	352.97	8.88	1.51
54	2-Nov-1991	22:51:17	36.298	75.757	128.37	12.14	5.68
55	3-Nov-1991	7:26:23	36.298	75.662	515.10	8.51	0.99
56	3-Nov-1991	11:11:13	36.274	75.555	224.83	9.96	2.66
57	3-Nov-1991	12:48:54	36.229	75.605	97.68	6.72	4.13
58	3-Nov-1991	14:30:17	36.233	75.693	101.38	7.91	4.68
59	4-Nov-1991	0:7:41	36.244	75.582	577.40	10.03	1.04
60	4-Nov-1991	7:11:50	36.243	75.683	424.15	9.06	1.28
61	4-Nov-1991	8:57:45	36.214	75.665	105.92	3.61	2.04
62	4-Nov-1991	12:27:6	36.185	75.619	209.35	5.24	1.50
63	4-Nov-1991	14:12:31	36.237	75.643	105.42	6.17	3.51
64	4-Nov-1991	18:38:31	36.168	75.567	266.00	10.26	2.32
65	4-Nov-1991	20:17:38	36.184	75.543	99.12	2.79	1.69
66	4-Nov-1991	22:9:44	36.159	75.533	112.10	2.92	1.56
67	4-Nov-1991	23:49:20	36.120	75.526	99.60	4.38	2.64
68	5-Nov-1991	1:29:28	36.091	75.521	100.13	3.26	1.95
69	5-Nov-1991	7:3:1	35.996	75.485	333.55	11.05	1.99
70	5-Nov-1991	8:43:7	35.976	75.472	100.10	2.51	1.51
71	5-Nov-1991	10:23:35	35.910	75.474	100.47	7.34	4.38
72	5-Nov-1991	12:9:21	35.935	75.472	105.77	2.79	1.58
73	5-Nov-1991	13:48:45	35.909	75.443	99.40	3.90	2.35
74	5-Nov-1991	18:26:40	35.822	75.428	277.92	9.77	2.11
75	5-Nov-1991	20:7:7	35.801	75.415	100.45	2.61	1.56
76	6-Nov-1991	1:7:48	35.744	75.425	300.68	6.40	1.28
77	6-Nov-1991	8:33:10	35.656	75.405	445.37	9.95	1.34
78	6-Nov-1991	11:46:35	35.645	75.382	193.42	2.41	0.75
79	6-Nov-1991	13:26:13	35.615	75.373	99.63	3.43	2.07
80	6-Nov-1991	18:13:33	35.587	75.404	287.33	4.19	0.87
81	6-Nov-1991	19:54:19	35.566	75.432	100.77	3.44	2.05
82	7-Nov-1991	0:47:12	35.513	75.440	292.88	5.94	1.22
83	7-Nov-1991	6:40:38	35.472	75.450	353.43	4.65	0.79
84	7-Nov-1991	11:25:58	35.381	75.465	285.33	10.21	2.15
85	7-Nov-1991	13:6:35	35.386	75.451	100.62	1.39	0.83
86	7-Nov-1991	14:47:18	35.444	75.439	100.72	6.54	3.90
87	7-Nov-1991	18:3:49	35.343	75.479	196.52	11.80	3.60
88	7-Nov-1991	19:43:34	35.314	75.487	99.75	3.30	1.99
89	7-Nov-1991	22:45:12	35.263	75.489	181.63	5.67	1.87
90	8-Nov-1991	0:27:5	35.250	75.507	101.88	2.18	1.29
91	8-Nov-1991	2:7:41	35.257	75.481	100.60	2.49	1.48
92	8-Nov-1991	6:27:45	35.184	75.511	260.07	8.56	1.98
93	8-Nov-1991	8:8:34	35.176	75.534	100.82	2.27	1.35
94	8-Nov-1991	9:47:58	35.147	75.496	99.40	4.73	2.85
95	8-Nov-1991	17:51:2	35.130	75.605	483.07	10.09	1.25
96	8-Nov-1991	19:31:28	35.197	75.554	100.43	8.77	5.24

Appendix 19. Continued.

POINT NO.	DATE	TIME (GMT)	LAT	LONG	TSLL (m)	DSLL (km)	SPEED (km/h)
97	9-Nov-1991	21: 0:29	35.087	75.631	1529.02	14.09	0.55
98	9-Nov-1991	22: 5:56	35.098	75.677	65.45	4.36	4.00
99	9-Nov-1991	23:42:55	35.068	75.720	96.98	5.14	3.18
100	10-Nov-1991	1:25:51	35.031	75.788	102.93	7.43	4.33
101	10-Nov-1991	9:25:58	35.022	75.954	480.12	15.15	1.89
102	10-Nov-1991	13:45: 9	35.043	76.014	259.18	5.94	1.38
103	10-Nov-1991	17:29:22	35.031	76.057	224.22	4.14	1.11
104	10-Nov-1991	19: 8: 4	35.033	76.051	98.70	0.59	0.36
105	10-Nov-1991	20:49:13	35.034	76.028	101.15	2.10	1.24
106	11-Nov-1991	7:34: 0	34.971	75.958	644.78	9.47	0.88
107	11-Nov-1991	9:13:57	34.973	75.936	99.95	2.02	1.21
108	11-Nov-1991	11:44: 3	34.933	75.904	150.10	5.32	2.13
109	11-Nov-1991	13:24:30	34.925	75.889	100.45	1.63	0.97
110	11-Nov-1991	15: 3:34	34.939	75.860	99.07	3.07	1.86
111	11-Nov-1991	18:55:53	34.948	75.801	232.32	5.47	1.41
112	11-Nov-1991	23: 3:42	34.969	75.846	247.82	4.72	1.14
113	12-Nov-1991	0:42:36	34.968	75.787	98.90	5.38	3.26
114	12-Nov-1991	7:23:53	34.933	75.715	401.28	7.63	1.14
115	12-Nov-1991	9: 2:47	34.926	75.735	98.90	1.98	1.20
116	12-Nov-1991	11:22: 6	34.900	75.761	139.32	3.74	1.61
117	12-Nov-1991	13: 2:34	34.889	75.726	100.47	3.42	2.04
118	12-Nov-1991	14:42:40	34.880	75.793	100.10	6.19	3.71
119	12-Nov-1991	18:44:13	34.844	75.773	241.55	4.40	1.09
120	13-Nov-1991	0:22:18	34.875	75.747	338.08	4.18	0.74
121	13-Nov-1991	12:42:15	34.979	75.668	739.95	13.62	1.10
122	13-Nov-1991	14:21:39	34.988	75.651	99.40	1.84	1.11
123	13-Nov-1991	20:13:34	34.928	75.618	351.92	7.32	1.25
124	14-Nov-1991	1:42: 4	34.980	75.699	328.50	9.38	1.71
125	14-Nov-1991	6:59:23	35.186	75.521	317.32	28.05	5.30
126	14-Nov-1991	12:19:30	35.098	75.504	320.12	9.91	1.86
127	14-Nov-1991	14: 1: 6	35.108	75.466	101.60	3.63	2.14
128	14-Nov-1991	18:22:13	35.155	75.329	261.12	13.51	3.10
129	14-Nov-1991	20: 1:37	35.171	75.286	99.40	4.30	2.59
130	14-Nov-1991	21:59:28	35.082	75.275	117.85	9.95	5.06
131	15-Nov-1991	6:45:31	35.287	75.268	526.05	22.80	2.60
132	15-Nov-1991	11:59:51	35.307	75.230	314.33	4.10	0.78
133	15-Nov-1991	13:40:18	35.303	75.230	100.45	0.44	0.27
134	15-Nov-1991	18:10:10	35.300	75.222	269.87	0.80	0.18
135	15-Nov-1991	19:52: 1	35.325	75.212	101.85	2.92	1.72
136	16-Nov-1991	0:59:18	35.380	75.182	307.28	6.69	1.31
137	16-Nov-1991	6:35: 4	35.522	75.090	335.77	17.85	3.19
138	16-Nov-1991	9:55: 7	35.406	75.013	200.05	14.66	4.40
139	16-Nov-1991	11:39:25	35.413	74.975	104.30	3.53	2.03
140	16-Nov-1991	13:19:31	35.430	74.923	100.10	5.08	3.04
141	16-Nov-1991	15: 0: 6	35.379	74.903	100.58	5.95	3.55
142	16-Nov-1991	17:59: 1	35.478	74.900	178.92	11.01	3.69
143	16-Nov-1991	19:40: 6	35.493	74.868	101.08	3.34	1.98
144	17-Nov-1991	0:37:15	35.527	74.867	297.15	3.78	0.76
145	17-Nov-1991	6:22:53	35.560	74.866	345.63	3.67	0.64
146	17-Nov-1991	8: 3:54	35.534	74.855	101.02	3.06	1.82

Appendix 19. Continued.

POINT NO.	DATE	TIME (GMT)	LAT	LONG	TSLL (m)	DSLL (km)	SPEED (km/h)
147	17-Nov-1991	9:44:42	35.532	74.870	100.80	1.38	0.82
148	17-Nov-1991	14:39:14	35.518	74.943	294.53	6.79	1.38
149	17-Nov-1991	17:46:37	35.520	74.966	187.38	2.09	0.67
150	18-Nov-1991	7:53:20	35.579	75.026	846.72	8.51	0.60
151	18-Nov-1991	14:16:40	35.589	74.993	383.33	3.19	0.50
152	18-Nov-1991	17:35:53	35.562	74.982	199.22	3.16	0.95
153	18-Nov-1991	20:56:59	35.590	75.024	201.10	4.91	1.47
154	18-Nov-1991	23:56:46	35.601	74.999	179.78	2.57	0.86
155	19-Nov-1991	1:37:41	35.541	75.047	100.92	7.96	4.73
156	19-Nov-1991	7:38:35	35.661	75.010	360.90	13.75	2.29
157	19-Nov-1991	9:17:52	35.643	75.063	99.28	5.19	3.14
158	19-Nov-1991	12:15:55	35.657	75.056	178.05	1.68	0.57
159	19-Nov-1991	13:57:14	35.692	75.011	101.32	5.63	3.33
160	19-Nov-1991	19: 5:32	35.748	75.022	308.30	6.30	1.23
161	19-Nov-1991	20:44:29	35.697	75.079	98.95	7.66	4.64
162	19-Nov-1991	23:35:54	35.779	75.047	171.42	9.56	3.35
163	20-Nov-1991	1:15:49	35.792	75.039	99.92	1.62	0.97
164	20-Nov-1991	7:29: 5	35.826	74.989	373.27	5.88	0.95
165	20-Nov-1991	11:56:26	35.873	75.003	267.35	5.38	1.21
166	20-Nov-1991	13:35: 8	35.882	74.967	98.70	3.39	2.06
167	20-Nov-1991	17:13:33	35.902	75.023	218.42	5.51	1.51
168	20-Nov-1991	18:52:15	35.901	74.937	98.70	7.75	4.71
169	20-Nov-1991	20:32:42	35.913	74.977	100.45	3.84	2.29
170	21-Nov-1991	0:55:35	35.916	74.928	262.88	4.43	1.01
171	21-Nov-1991	7:15:24	35.930	74.924	379.82	1.60	0.25
172	21-Nov-1991	8:57:38	35.914	74.893	102.23	3.31	1.94
173	21-Nov-1991	11:34:26	35.913	74.881	156.80	1.09	0.42
174	21-Nov-1991	13:16:38	35.914	74.860	102.20	1.89	1.11
175	21-Nov-1991	14:53:57	35.877	74.899	97.32	5.41	3.34
176	21-Nov-1991	18:40: 2	35.936	74.825	226.08	9.35	2.48
177	21-Nov-1991	20:22:10	35.954	74.827	102.13	2.01	1.18
178	22-Nov-1991	0:34:57	35.979	74.826	252.78	2.78	0.66
179	22-Nov-1991	7: 6:59	35.947	74.877	392.03	5.81	0.89
180	22-Nov-1991	8:45:46	35.983	74.872	98.78	4.03	2.45
181	22-Nov-1991	11:13: 6	35.946	74.838	147.33	5.13	2.09
182	22-Nov-1991	12:52:57	35.954	74.865	99.85	2.59	1.56
183	22-Nov-1991	14:33: 4	35.970	74.816	100.12	4.76	2.85
184	22-Nov-1991	18:29:40	35.963	74.786	236.60	2.81	0.71
185	22-Nov-1991	20:10:13	35.968	74.778	100.55	0.91	0.54
186	22-Nov-1991	22:33:21	35.936	74.779	143.13	3.56	1.49
187	23-Nov-1991	1:52:39	36.049	74.674	199.30	15.72	4.73
188	23-Nov-1991	6:53:52	36.045	74.737	301.22	5.68	1.13
189	23-Nov-1991	8:34:15	36.015	74.765	100.38	4.18	2.50
190	23-Nov-1991	10:14:11	36.021	74.770	99.93	0.80	0.48
191	23-Nov-1991	12:32:26	35.992	74.778	138.25	3.30	1.43
192	23-Nov-1991	14:12:53	35.981	74.795	100.45	1.96	1.17
193	23-Nov-1991	18:17:53	35.965	74.750	245.00	4.42	1.08
194	23-Nov-1991	19:58: 0	35.964	74.757	100.12	0.64	0.38
195	23-Nov-1991	22:13:47	35.956	74.741	135.78	1.69	0.75
196	23-Nov-1991	23:53:16	35.974	74.785	99.48	4.44	2.68

Appendix 19. Continued.

POINT NO.	DATE	TIME (GMT)	LAT	LONG	TSLL (m)	DSLL (km)	SPEED (km/h)
197	24-Nov-1991	1:33: 2	35.985	74.759	99.77	2.64	1.59
198	24-Nov-1991	6:43:39	36.034	74.664	310.62	10.13	1.96
199	24-Nov-1991	8:23:15	35.993	74.709	99.60	6.10	3.67
200	24-Nov-1991	10: 3: 2	35.980	74.684	99.78	2.67	1.61
201	24-Nov-1991	12:11:37	36.003	74.712	128.58	3.59	1.67
202	24-Nov-1991	13:51: 6	36.027	74.647	99.48	6.43	3.88
203	24-Nov-1991	18: 7:43	36.011	74.641	256.62	1.86	0.43
204	24-Nov-1991	19:47:17	36.041	74.652	99.57	3.48	2.10
205	24-Nov-1991	23:27:46	36.071	74.566	220.48	8.42	2.29
206	25-Nov-1991	6:30:42	36.029	74.603	422.93	5.73	0.81
207	25-Nov-1991	8:11:35	36.058	74.708	100.88	9.98	5.93
208	25-Nov-1991	9:53: 9	36.061	74.603	101.57	9.45	5.58
209	25-Nov-1991	11:49:46	36.021	74.481	116.62	11.84	6.09
210	25-Nov-1991	13:30: 6	36.041	74.470	100.33	2.43	1.46
211	25-Nov-1991	17:53:41	36.094	74.453	263.58	6.09	1.39
212	25-Nov-1991	19:34:22	36.179	74.431	100.68	9.65	5.75
213	25-Nov-1991	21:15:23	36.186	74.412	101.02	1.87	1.11
214	25-Nov-1991	23: 7: 5	36.237	74.353	111.70	7.76	4.17
215	26-Nov-1991	8: 0: 9	36.366	74.268	533.07	16.24	1.83
216	26-Nov-1991	9:39:13	36.376	74.351	99.07	7.51	4.55
217	26-Nov-1991	11:29:30	36.407	74.355	110.28	3.47	1.89
218	26-Nov-1991	13: 9: 0	36.443	74.218	99.50	12.90	7.78
219	26-Nov-1991	14:48:39	36.537	74.280	99.65	11.83	7.12
220	26-Nov-1991	17:42:57	36.415	74.264	174.30	13.64	4.69
221	26-Nov-1991	19:22:45	36.408	74.300	99.80	3.31	1.99
222	26-Nov-1991	22:51:21	36.390	74.080	208.60	19.79	5.69
223	27-Nov-1991	7:45:39	36.578	74.308	534.30	29.20	3.28
224	27-Nov-1991	9:28:22	36.575	74.293	102.72	1.38	0.81
225	27-Nov-1991	11: 8:24	36.592	74.377	100.03	7.74	4.64
226	27-Nov-1991	12:49:17	36.562	74.337	100.88	4.89	2.91
227	27-Nov-1991	14:27:59	36.541	74.330	98.70	2.42	1.47
228	27-Nov-1991	17:31:45	36.512	74.366	183.77	4.55	1.49
229	27-Nov-1991	19:11: 9	36.498	74.347	99.40	2.30	1.39
230	27-Nov-1991	20:52:40	36.408	74.383	101.52	10.51	6.21
231	27-Nov-1991	22:29:23	36.425	74.441	96.72	5.52	3.43
232	28-Nov-1991	0: 8:25	36.441	74.439	99.03	1.79	1.08
233	28-Nov-1991	1:46:13	36.491	74.460	97.80	5.87	3.60
234	28-Nov-1991	7:35: 3	36.392	74.502	348.83	11.63	2.00
235	28-Nov-1991	9:16: 5	36.388	74.499	101.03	0.52	0.31
236	28-Nov-1991	12:27:53	36.403	74.502	191.80	1.69	0.53
237	28-Nov-1991	14: 7:17	36.407	74.514	99.40	1.16	0.70
238	28-Nov-1991	17:18:37	36.427	74.488	191.33	3.22	1.01
239	28-Nov-1991	18:59:45	36.451	74.513	101.13	3.48	2.07
240	28-Nov-1991	20:40:35	36.456	74.524	100.83	1.13	0.67
241	28-Nov-1991	22: 8:18	36.506	74.528	87.72	5.57	3.81
242	28-Nov-1991	23:47:23	36.445	74.574	99.08	7.93	4.80
243	29-Nov-1991	7:22:44	36.481	74.463	455.35	10.70	1.41
244	29-Nov-1991	9: 4:14	36.499	74.447	101.50	2.46	1.45
245	29-Nov-1991	12: 6:45	36.528	74.420	182.52	4.03	1.32
246	29-Nov-1991	13:46:51	36.525	74.426	100.10	0.63	0.38

Appendix 19. Continued.

POINT NO.	DATE	TIME (GMT)	LAT	LONG	TSSL (m)	DSLL (km)	SPEED (km/h)
247	29-Nov-1991	17: 8:49	36.578	74.421	201.97	5.91	1.76
248	29-Nov-1991	18:47: 2	36.529	74.380	98.22	6.56	4.01
249	29-Nov-1991	20:29:28	36.527	74.320	102.43	5.37	3.14
250	30-Nov-1991	1: 9:22	36.570	74.296	279.90	5.24	1.12
251	30-Nov-1991	7:12:21	36.573	74.345	362.98	4.39	0.73
252	30-Nov-1991	11:45:40	36.592	74.352	273.32	2.20	0.48
253	30-Nov-1991	15: 4:28	36.630	74.369	198.80	4.49	1.35
254	30-Nov-1991	16:56:29	36.654	74.378	112.02	2.79	1.49
255	30-Nov-1991	20:16:46	36.629	74.275	200.28	9.60	2.88
256	1-Dec-1991	6:58:49	36.634	74.134	642.05	12.60	1.18
257	1-Dec-1991	11:23:18	36.711	74.142	264.48	8.59	1.95
258	1-Dec-1991	13: 4:56	36.673	74.105	101.63	5.36	3.16
259	1-Dec-1991	14:45: 3	36.710	74.103	100.12	4.12	2.47
260	1-Dec-1991	18:23:45	36.697	74.137	218.70	3.36	0.92
261	1-Dec-1991	20: 6:37	36.710	74.148	102.87	1.75	1.02
262	2-Dec-1991	0:23:58	36.714	74.160	257.35	1.16	0.27
263	2-Dec-1991	6:49:27	36.653	74.268	385.48	11.78	1.83
264	2-Dec-1991	12:45:32	36.711	74.317	356.08	7.79	1.31
265	2-Dec-1991	14:23:46	36.699	74.349	98.23	3.15	1.92
266	2-Dec-1991	18:12:26	36.703	74.383	228.67	3.06	0.80
267	2-Dec-1991	19:52:53	36.744	74.448	100.45	7.37	4.40
268	2-Dec-1991	22:24: 1	36.752	74.473	151.13	2.40	0.95
269	3-Dec-1991	8:16:50	36.857	74.513	592.82	12.20	1.24
270	3-Dec-1991	12:21:28	36.896	74.585	244.63	7.73	1.90
271	3-Dec-1991	14: 3:19	36.893	74.642	101.85	5.08	2.99
272	3-Dec-1991	18: 1:49	36.930	74.679	238.50	5.27	1.33
273	3-Dec-1991	22: 4:48	36.874	74.545	242.98	13.45	3.32
274	4-Dec-1991	12: 2:49	36.936	74.658	838.02	12.19	0.87
275	4-Dec-1991	13:42:13	36.929	74.661	99.40	0.82	0.50
276	5-Dec-1991	0:56:46	36.785	74.764	674.55	18.45	1.64
277	5-Dec-1991	9:34:53	36.842	74.763	518.12	6.34	0.73
278	5-Dec-1991	11:41:35	36.832	74.763	126.70	1.11	0.53
279	5-Dec-1991	13:21: 0	36.848	74.754	99.42	1.95	1.18
280	5-Dec-1991	15: 0:24	36.888	74.708	99.40	6.04	3.65
281	5-Dec-1991	17:38:37	36.846	74.741	158.22	5.52	2.09
282	6-Dec-1991	9:22:25	36.921	74.837	943.80	11.94	0.76
283	6-Dec-1991	11:20:22	36.928	74.820	117.95	1.70	0.86
284	6-Dec-1991	13: 0:49	36.955	74.756	100.45	6.43	3.84
285	6-Dec-1991	14:39:24	36.998	74.766	98.58	4.86	2.96
286	6-Dec-1991	17:27: 4	37.031	74.767	167.67	3.67	1.31
287	6-Dec-1991	19: 5:46	37.035	74.765	98.70	0.48	0.29
288	6-Dec-1991	20:47:58	37.048	74.770	102.20	1.51	0.89
289	7-Dec-1991	0:19:32	37.081	74.798	211.57	4.43	1.26
290	7-Dec-1991	2: 0:20	37.080	74.800	100.80	0.21	0.12
291	7-Dec-1991	7:30:24	37.113	74.819	330.07	4.04	0.73
292	7-Dec-1991	10:58:26	37.096	74.845	208.03	2.98	0.86
293	7-Dec-1991	14:18:52	37.171	74.842	200.43	8.34	2.50
294	7-Dec-1991	17:15:37	37.210	74.814	176.75	5.00	1.70
295	7-Dec-1991	18:54:40	37.199	74.814	99.05	1.22	0.74
296	7-Dec-1991	20:36:32	37.205	74.816	101.87	0.69	0.41

Appendix 19. Continued.

POINT NO.	DATE	TIME (GMT)	LAT	LONG	TSLL (m)	DSLL (km)	SPEED (km/h)
297	8-Dec-1991	1:39:44	37.223	74.844	303.20	3.19	0.63
298	8-Dec-1991	12:22:37	37.316	74.970	642.88	15.21	1.42
299	8-Dec-1991	17: 3:55	37.254	74.895	281.30	9.57	2.04
300	8-Dec-1991	18:44: 2	37.259	74.906	100.12	1.12	0.67
301	8-Dec-1991	20:23:47	37.243	74.919	99.75	2.12	1.27
302	8-Dec-1991	23:38:20	37.229	74.921	194.55	1.57	0.48
303	9-Dec-1991	1:18:48	37.226	74.933	100.47	1.11	0.67
304	9-Dec-1991	7: 7:20	37.208	74.942	348.53	2.15	0.37
305	9-Dec-1991	11:59:43	37.187	75.026	292.38	7.80	1.60
306	9-Dec-1991	18:30:54	37.202	74.966	391.18	5.57	0.85
307	9-Dec-1991	20:12:24	37.182	74.985	101.50	2.79	1.65
308	10-Dec-1991	6:56:16	37.113	75.054	643.87	9.81	0.91
309	10-Dec-1991	11:32:48	37.048	75.091	276.53	7.94	1.72
310	10-Dec-1991	13:15:13	37.031	75.070	102.42	2.66	1.56
311	10-Dec-1991	14:54:59	36.974	75.153	99.77	9.72	5.85
312	10-Dec-1991	18:19:44	36.962	75.108	204.75	4.21	1.24
313	10-Dec-1991	19:58:34	36.945	75.138	98.83	3.27	1.98
314	11-Dec-1991	0:37:38	36.894	75.128	279.07	5.74	1.23
315	11-Dec-1991	6:41:48	36.859	75.186	364.17	6.46	1.06
316	11-Dec-1991	8:25:44	36.831	75.131	103.93	5.80	3.35
317	11-Dec-1991	10: 4:27	36.820	75.222	98.72	8.19	4.98
318	11-Dec-1991	11:15:31	36.829	75.192	71.07	2.85	2.41
319	11-Dec-1991	12:55:58	36.826	75.254	100.45	5.53	3.30
320	11-Dec-1991	14:35: 1	36.790	75.225	99.05	4.76	2.89
321	11-Dec-1991	18: 7: 7	36.815	75.247	212.10	3.40	0.96
322	11-Dec-1991	19:48:17	36.809	75.225	101.17	2.07	1.23
323	11-Dec-1991	21:29:47	36.803	75.315	101.50	8.04	4.75

Appendix 20. Temperature and diving data collected from satellite telemetered turtle 1229. TIME in Greenwich mean time, TEMP = transmitter temperature in C, MEAN DIVE = mean dive duration in each 12 hour period, in minutes, NO. DIVE = number of dives in each 12 hour period.

DATE	TIME	TEMP (C)	MEAN DIVE	NO. DIVE
27-Oct-1991	8:40:58	17.18	2.90	15
27-Oct-1991	13:31:54	17.57	3.37	04
28-Oct-1991	1: 2:58	17.18	5.80	47
28-Oct-1991	13:13:52	17.18	2.47	52
29-Oct-1991	2:15:52	17.18	19.83	07
29-Oct-1991	12:49:8	16.41	37.17	07
30-Oct-1991	0:12:17	16.41	21.80	06
31-Oct-1991	1:29:46	16.41	60.97	01
31-Oct-1991	12:10:7	17.57	10.53	04
1-Nov-1991	1: 9:53	17.95	2.93	20
1-Nov-1991	13:29:8	19.10	1.33	05
2-Nov-1991	13:10:51	17.95	116.23	06
3-Nov-1991	12:50:46	17.95	93.83	07
4-Nov-1991	20:22:0	17.18	60.97	11
5-Nov-1991	1:32:49	16.41	37.10	14
5-Nov-1991	12:10:47	16.41	11.37	04
6-Nov-1991	1: 1:24	16.41	3.50	14
6-Nov-1991	13:28:56	16.80	2.13	08
7-Nov-1991	0:52:21	16.41	1.47	42
7-Nov-1991	13: 6:36	16.41	41.23	01
8-Nov-1991	0:24:55	16.41	1.33	20
8-Nov-1991	12:41:57	16.41	85.00	06
9-Nov-1991	0:10:40	16.41	5.90	28
9-Nov-1991	12:20:34	15.64	1.40	04
10-Nov-1991	1:29:34	16.03	20.13	13
10-Nov-1991	12:11:0	16.03	1.00	01
11-Nov-1991	1: 2:14	14.87	22.50	01
12-Nov-1991	0:40:27	14.49	3.87	07
12-Nov-1991	12:59:56	14.87	94.27	05
13-Nov-1991	0:26:4	13.34	2.80	38

Appendix 21. Temperature and diving data collected from satellite telemetered turtle 4938. TIME in Greenwich mean time, TEMP = transmitter temperature in C, MEAN DIVE = mean dive duration in each 12 hour period, in minutes, NO. DIVE = number of dives in each 12 hour period.

DATE	TIME	TEMP (C)	MEAN DIVE	NO. DIVE
29-Oct-1991	12:57:54	18.82	36.43	18
30-Oct-1991	0: 8:58	18.43	34.27	19
30-Oct-1991	12:28:17	17.65	54.67	12
31-Oct-1991	9:40:56	17.65	24.77	25
31-Oct-1991	12: 7:26	18.04	58.10	11
1-Nov-1991	7:49:54	17.65	34.27	18
1-Nov-1991	13:33:31	17.65	53.70	12
2-Nov-1991	0:45:54	17.26	50.43	13
2-Nov-1991	13: 8:32	17.26	65.20	10
3-Nov-1991	11:13:30	17.65	73.07	09
3-Nov-1991	14:27:34	18.43	60.63	11
4-Nov-1991	8:50:50	17.65	60.90	11
4-Nov-1991	12:34:9	17.65	48.07	14
5-Nov-1991	7: 5:24	16.87	8.27	80
5-Nov-1991	12:13:11	17.65	39.43	17
6-Nov-1991	6:52:58	18.04	14.77	42
6-Nov-1991	13:29:25	17.65	6.00	92
7-Nov-1991	8:26:20	16.87	4.07	155
7-Nov-1991	18: 7:30	17.26	48.90	13
8-Nov-1991	12:42:37	16.08	96.63	07
9-Nov-1991	0: 3:11	20.78	44.03	15
9-Nov-1991	14: 3:10	18.43	43.73	15
10-Nov-1991	7:39:8	18.82	21.07	31
10-Nov-1991	13:38:15	18.04	113.97	06
11-Nov-1991	15: 0:37	16.87	86.03	08
12-Nov-1991	13: 8:35	17.65	67.57	10
13-Nov-1991	0:17:30	16.08	7.90	82
13-Nov-1991	12:42:25	17.26	28.40	23
14-Nov-1991	12:17:7	18.43	55.07	12
17-Nov-1991	14:35:18	14.91	86.10	08
18-Nov-1991	9:33:36	14.52	13.53	46
18-Nov-1991	12:40:15	14.91	95.40	07
19-Nov-1991	12:12:59	14.91	9.77	61
20-Nov-1991	18:58:52	15.69	115.30	06
21-Nov-1991	7:15:9	16.08	29.20	23
21-Nov-1991	13:12:12	15.69	68.37	10
22-Nov-1991	7: 9:14	15.69	19.87	34
22-Nov-1991	14:29:38	16.08	68.00	10
23-Nov-1991	18:12:33	16.47	84.87	08
24-Nov-1991	12:13:46	16.87	84.63	08
25-Nov-1991	6:32:43	17.65	58.97	11
25-Nov-1991	13:31:42	18.04	115.90	06
26-Nov-1991	13: 7:56	17.26	137.03	05
27-Nov-1991	0:29:28	16.87	4.47	121
27-Nov-1991	12:48:12	17.65	5.67	98
28-Nov-1991	7:38:50	16.47	9.27	63

Appendix 21. Continued.

DATE	TIME (GMT)	TEMP (C)	MEAN DIVE	NO. DIVE
28-Nov-1991	12:22:54	16.08	84.27	08
29-Nov-1991	1:21:4	14.91	15.40	42
30-Nov-1991	8:52:58	14.12	73.37	09
30-Nov-1991	13:21:44	14.12	85.17	08
1-Dec-1991	13: 4:36	15.69	84.43	08
2-Dec-1991	12:41:57	16.08	97.80	07
3-Dec-1991	12:27:16	16.08	75.57	09
4-Dec-1991	8:12:24	18.43	60.17	11
4-Dec-1991	13:39:24	18.43	85.13	08
5-Dec-1991	13:27:23	17.65	137.40	05
6-Dec-1991	0:43:35	17.65	5.07	75
6-Dec-1991	13: 4:6	17.65	59.47	11
7-Dec-1991	12:35:40	16.87	137.70	05
8-Dec-1991	12:23:26	16.08	98.13	07
9-Dec-1991	8:47:14	14.91	56.17	11
9-Dec-1991	18:27:37	15.30	138.77	05
10-Dec-1991	8:32:48	16.08	66.73	10
10-Dec-1991	13:20:26	15.69	75.73	09
11-Dec-1991	18: 6:15	18.04	97.67	07
12-Dec-1991	14:17:23	17.65	61.07	11
13-Dec-1991	9:42:44	16.47	59.33	11
13-Dec-1991	19:25:19	17.26	174.63	04
14-Dec-1991	9:24:44	15.69	55.00	12
14-Dec-1991	13:40:58	15.69	138.53	05
15-Dec-1991	19: 2:20	15.69	174.30	04
16-Dec-1991	12:47:5	14.91	173.27	04
18-Dec-1991	7: 2:46	16.47	174.67	04
19-Dec-1991	13:25:1	15.69	175.13	04
20-Dec-1991	6:38:37	15.30	52.83	12
20-Dec-1991	21:20:35	16.47	84.37	08
25-Dec-1991	0:35:23	16.47	75.77	09
25-Dec-1991	13: 0:33	16.47	174.37	04
26-Dec-1991	12:43:4	16.08	24.40	24
27-Dec-1991	12:21:19	15.30	113.17	06
28-Dec-1991	13:37:14	16.08	137.17	05
30-Dec-1991	12:55:23	16.47	236.53	03
31-Dec-1991	1:58:48	15.69	98.07	07
31-Dec-1991	14:12:7	16.47	138.77	05
1-Jan-1992	7:36:8	16.08	7.47	69
1-Jan-1992	13:53:51	16.08	82.87	08
2-Jan-1992	13:37:17	16.08	113.47	06
5-Jan-1992	18:17:53	16.08	234.57	03
6-Jan-1992	18: 6:28	16.47	137.97	05
7-Jan-1992	19:25:4	16.47	234.47	03
8-Jan-1992	20:57:0	21.18	353.93	02
12-Jan-1992	20: 9:54	15.30	234.30	03
14-Jan-1992	18: 7:18	16.47	174.67	04
15-Jan-1992	14: 1:16	16.08	355.77	02
18-Jan-1992	20:37:49	17.65	235.63	03

Appendix 22. Temperature and diving data collected from satellite telemetered turtle 4939. TIME in Greenwich mean time, TEMP = transmitter temperature in C, MEAN DIVE = mean dive duration in each 12 hour period, in minutes, NO. DIVE = number of dives in each 12 hour period.

DATE	TIME	TEMP (C)	MEAN DIVE	NO. DIVE
30-Oct-1991	9:56:51	17.47	28.43	15
30-Oct-1991	14:15:15	18.27	95.50	07
31-Oct-1991	12:14:28	17.47	136.60	05
1-Nov-1991	1: 7:21	16.27	5.50	53
1-Nov-1991	13:30:3	20.27	20.00	30
2-Nov-1991	0:45:19	22.67	1.77	181
2-Nov-1991	13: 8:3	19.47	13.60	47
3-Nov-1991	7:20:53	19.87	2.97	182
3-Nov-1991	12:55:39	18.27	39.73	17
4-Nov-1991	12:32:36	18.27	36.27	19
5-Nov-1991	20: 3:35	18.27	48.10	14
6-Nov-1991	6:45:5	19.07	4.80	112
6-Nov-1991	18: 8:47	19.07	76.30	09
8-Nov-1991	12:42:38	17.07	30.10	23
9-Nov-1991	12:30:34	19.07	20.30	27
10-Nov-1991	12: 5:20	19.87	27.00	24
11-Nov-1991	18:55:51	16.67	99.27	07
12-Nov-1991	18:40:41	17.07	68.57	10
13-Nov-1991	14:17:55	16.27	27.27	25
14-Nov-1991	13:58:51	16.27	98.77	07
15-Nov-1991	11:56:7	15.87	4.67	134
15-Nov-1991	12: 3:2	16.27	117.40	06
16-Nov-1991	1: 5:33	16.27	6.03	102
16-Nov-1991	13:25:32	15.87	76.57	09
17-Nov-1991	12:55:51	16.27	99.97	07
18-Nov-1991	7:57:26	15.47	2.80	159
18-Nov-1991	12:38:30	15.07	15.80	40
19-Nov-1991	12:17:35	19.07	19.20	34
20-Nov-1991	13:33:37	16.27	116.83	06
21-Nov-1991	8:54:37	16.27	6.87	95
21-Nov-1991	13:16:24	17.07	12.73	49
22-Nov-1991	12:51:32	16.27	7.77	83
23-Nov-1991	14:18:5	16.27	57.17	12
24-Nov-1991	12:10:55	15.87	177.40	04
25-Nov-1991	1:11:21	15.07	40.20	17
25-Nov-1991	17:57:26	15.47	76.53	09
26-Nov-1991	0:51:21	15.07	11.40	58
26-Nov-1991	17:43:56	15.87	52.63	13
27-Nov-1991	12:52:37	15.07	45.67	15
28-Nov-1991	12:30:29	15.07	86.63	08
29-Nov-1991	13:45:7	16.27	62.70	11
30-Nov-1991	1:10:3	16.27	5.93	113
30-Nov-1991	13:31:6	16.27	76.43	09
1-Dec-1991	18:22:14	16.67	99.70	07
2-Dec-1991	12:38:23	15.47	77.70	09
3-Dec-1991	12:20:26	15.07	52.93	13

Appendix 22. Continued.

DATE	TIME (GMT)	TEMP (C)	MEAN DIVE	NO. DIVE
4-Dec-1991	12: 5:48	15.47	98.40	07
5-Dec-1991	11:41:47	17.07	3.97	144
5-Dec-1991	13:28:1	18.27	21.77	31
6-Dec-1991	14:38:32	17.07	46.13	15
7-Dec-1991	14:16:56	18.67	177.70	04
8-Dec-1991	7:18:45	17.87	50.63	03
8-Dec-1991	12:15:58	18.67	69.07	10
9-Dec-1991	11:55:17	20.27	7.60	48
9-Dec-1991	20: 8:46	20.67	57.87	12
10-Dec-1991	11:34:39	19.87	10.07	65
10-Dec-1991	13:15:33	19.87	69.03	10
11-Dec-1991	0:31:47	18.67	4.10	154
11-Dec-1991	12:58:2	17.87	10.13	66
12-Dec-1991	14:17:34	16.27	69.40	10
14-Dec-1991	13:28:47	14.67	177.00	04
15-Dec-1991	11:32:25	15.07	48.93	14
15-Dec-1991	14:52:3	16.27	62.80	11
17-Dec-1991	14:15:8	15.07	140.93	05
18-Dec-1991	8:41:11	15.07	13.20	51
19-Dec-1991	6:49:36	15.07	23.63	28
19-Dec-1991	15: 7:46	15.87	12.27	55
20-Dec-1991	14:49:30	15.07	21.70	31
21-Dec-1991	0:27:24	15.07	5.07	128
21-Dec-1991	17:48:59	15.87	26.10	26
22-Dec-1991	12:22:28	15.07	175.73	04
23-Dec-1991	13:50:53	15.87	139.87	05
24-Dec-1991	7:37:46	16.27	13.83	49
25-Dec-1991	13: 9:17	16.27	234.83	03
26-Dec-1991	12:43:3	16.67	16.97	40
27-Dec-1991	6:55:32	15.87	8.47	78
27-Dec-1991	13:12:53	15.87	99.40	07
28-Dec-1991	18:12:7	15.87	117.03	06
29-Dec-1991	1: 0:24	15.87	57.80	12
29-Dec-1991	14:57:46	16.27	70.00	10
2-Jan-1992	23: 9:16	16.27	140.30	05
4-Jan-1992	7: 6:25	16.27	33.37	21

Appendix 23. Temperature and diving data collected from satellite telemetered turtle 4932. TIME in Greenwich mean time, TEMP = transmitter temperature in C, MEAN DIVE = mean dive duration in each 12 hour period, in minutes, NO. DIVE = number of dives in each 12 hour period.

DATE	TIME (GMT)	TEMP (C)	MEAN DIVE	NO. DIVE
11-Nov-1989	6:58:48	18.39	18.63	33
12-Nov-1989	6:49: 2	18.39	53.37	12
12-Nov-1989	14:24: 0	18.66	58.83	11
13-Nov-1989	17:59:49	18.93	48.53	13
15-Nov-1989	7:46:26	18.93	9.33	68
15-Nov-1989	19:11:45	19.20	26.10	25
16-Nov-1989	6: 3:23	18.93	40.23	16
16-Nov-1989	14:31:48	19.20	44.17	15
17-Nov-1989	14: 9: 3	20.29	19.77	32
18-Nov-1989	7:18: 5	22.74	4.80	137
18-Nov-1989	18:37:36	22.47	8.37	79
19-Nov-1989	5:25:54	18.12	3.60	185
19-Nov-1989	16:48:47	18.93	5.80	116
20-Nov-1989	6:53:37	18.39	14.13	47
20-Nov-1989	16:42:13	18.93	7.47	90
21-Nov-1989	6:52:45	19.20	8.43	80
21-Nov-1989	14:18:46	19.48	18.30	37
22-Nov-1989	6:44:35	18.39	9.27	73
22-Nov-1989	18: 3:51	20.29	12.77	53
23-Nov-1989	17:44:31	18.93	22.13	29
25-Nov-1989	7:40: 6	18.12	4.57	142
26-Nov-1989	7:38:46	16.48	9.43	68
26-Nov-1989	17:18:55	16.76	30.80	22
27-Nov-1989	18:47:30	18.12	67.70	10
28-Nov-1989	16:57:16	17.30	15.50	42
29-Nov-1989	5:24:51	16.76	73.93	9
29-Nov-1989	14:32:55	16.21	75.97	9
30-Nov-1989	20: 3:29	17.57	50.77	12
1-Dec-1989	16:26:46	18.12	96.43	7
4-Dec-1989	6: 7:45	16.48	80.40	8
6-Dec-1989	18:47:27	17.30	84.83	8
8-Dec-1989	5:26:26	19.48	40.63	16
8-Dec-1989	14:32:33	20.56	26.17	22
10-Dec-1989	19:55:38	15.67	56.03	12
11-Dec-1989	19:44:27	15.94	66.80	10
13-Dec-1989	7:58:21	17.84	112.90	6
13-Dec-1989	14:19:19	17.30	71.87	9
14-Dec-1989	14: 5:19	21.11	74.07	9
17-Dec-1989	18:36:11	15.39	58.13	11
18-Dec-1989	18:20:21	15.12	77.93	8
19-Dec-1989	18:11:35	15.39	45.50	14
20-Dec-1989	18: 1:11	15.39	62.27	10
21-Dec-1989	19:39:19	15.67	36.23	17
22-Dec-1989	6:17:56	16.21	18.27	35
22-Dec-1989	17:42:56	16.21	78.70	8
23-Dec-1989	17:34:44	16.21	19.90	20

Appendix 23. Continued.

DATE	TIME (GMT)	TEMP (C)	MEAN DIVE	NO. DIVE
24-Dec-1989	6: 1:38	16.21	43.37	15
24-Dec-1989	18:56:51	17.84	62.20	10
26-Dec-1989	14:32:25	17.84	137.20	5
27-Dec-1989	16:51:58	17.57	172.03	4
28-Dec-1989	18:24:21	16.21	138.70	5
29-Dec-1989	18: 6: 4	17.57	46.33	14
30-Dec-1989	2:22: 8	17.57	20.77	33
30-Dec-1989	18: 2:19	17.30	13.43	51
31-Dec-1989	6:27:47	17.30	32.30	21
31-Dec-1989	14:22:20	18.12	57.53	12
2-Jan-1990	6: 8:51	18.66	116.33	6
3-Jan-1990	18:58:17	16.48	115.20	6
4-Jan-1990	2: 6:29	15.94	113.70	6
5-Jan-1990	18:30:51	15.94	138.20	5
6-Jan-1990	18:22: 9	15.94	112.83	6
10-Jan-1990	17:47:32	21.65	116.57	6
11-Jan-1990	7:44:45	18.93	116.13	6
12-Jan-1990	2:25:43	18.12	21.57	32
12-Jan-1990	17:18:27	18.39	26.43	26
13-Jan-1990	7:34:36	18.39	17.33	40
13-Jan-1990	17:14:43	18.39	13.63	50
16-Jan-1990	7: 5: 0	20.29	62.00	11
17-Jan-1990	14:36:32	20.29	141.83	5
18-Jan-1990	14: 7:48	20.56	141.83	5
19-Jan-1990	19:22:41	19.75	100.27	7
20-Jan-1990	6:18:48	20.84	137.87	5
21-Jan-1990	14:40: 5	21.38	117.47	6
22-Jan-1990	5:54:33	20.56	12.70	51
23-Jan-1990	18:45:19	21.38	100.20	7
26-Jan-1990	19:48:28	22.74	63.03	11
27-Jan-1990	6:45:54	20.29	3.33	188
27-Jan-1990	14:11:51	20.29	7.00	93
29-Jan-1990	15: 3:48	21.92	11.47	61
31-Jan-1990	7:41:58	23.29	37.20	19
2-Feb-1990	18:35:42	22.74	21.57	32
3-Feb-1990	14:47:29	23.56	49.10	14
4-Feb-1990	18:10:59	26.01	9.00	75
5-Feb-1990	6:46:28	25.19	3.60	187
5-Feb-1990	19:41:13	24.92	3.90	177
6-Feb-1990	6:37:14	23.83	2.83	244
6-Feb-1990	19:37:52	24.65	2.47	278
7-Feb-1990	19:27:20	24.92	2.67	255
8-Feb-1990	14:36:50	25.19	21.13	33
9-Feb-1990	6: 1:40	25.19	16.40	42
11-Feb-1990	18:47:33	26.01	16.73	41
12-Feb-1990	20: 7:43	25.19	2.53	265
13-Feb-1990	6:57: 8	24.10	4.10	169
13-Feb-1990	14:20:11	24.10	7.20	97
14-Feb-1990	19:46: 0	23.83	13.40	51
15-Feb-1990	17:56:38	24.10	16.90	40

Appendix 23. Continued.

DATE	TIME (GMT)	TEMP (C)	MEAN DIVE	NO. DIVE
16-Feb-1990	8: 6:40	24.10	3.33	207
17-Feb-1990	2:10:34	25.73	4.60	150
17-Feb-1990	14:31: 4	24.65	3.20	219
18-Feb-1990	19: 7:27	26.01	4.67	149
19-Feb-1990	19: 1: 4	26.28	17.63	39
20-Feb-1990	5:46:19	25.73	31.43	22
20-Feb-1990	18:43:39	26.82	2.87	240
21-Feb-1990	7:10:10	26.28	3.80	183
21-Feb-1990	14:43:48	26.01	4.50	153
22-Feb-1990	7:11:29	26.55	7.17	97
23-Feb-1990	19:48:19	27.37	16.23	43
24-Feb-1990	18: 5:39	25.46	11.30	62
26-Feb-1990	14:26:53	23.01	29.10	24
28-Feb-1990	18:56: 8	21.92	38.63	18
1-Mar-1990	15: 0:52	21.92	58.63	12
3-Mar-1990	7: 7:26	24.10	17.23	41
3-Mar-1990	18:26:45	23.56	18.43	38
4-Mar-1990	6:52:52	23.83	15.77	45
5-Mar-1990	6:49:56	23.29	34.90	20
5-Mar-1990	18: 1:25	23.29	43.57	16
8-Mar-1990	6:18:27	24.65	7.17	98
9-Mar-1990	7:39:37	22.74	11.17	63
10-Mar-1990	7:40: 3	22.74	18.50	38
13-Mar-1990	18:15:18	24.65	23.23	30
16-Mar-1990	6:26: 7	26.01	16.57	42
17-Mar-1990	7:59:19	25.73	11.47	61
18-Mar-1990	7:46:16	26.82	7.63	92
19-Mar-1990	5:57:31	25.19	10.70	65
20-Mar-1990	14:34:22	26.55	23.87	29
21-Mar-1990	18:30: 2	24.65	32.93	21
22-Mar-1990	7: 1:56	23.29	28.47	24
23-Mar-1990	18:18: 5	24.37	32.80	21
24-Mar-1990	14:36:10	24.37	24.17	26
26-Mar-1990	19:18:44	26.28	34.70	20
27-Mar-1990	19:12:25	27.09	24.57	28
28-Mar-1990	6: 2:22	26.82	22.17	31
28-Mar-1990	17:22:48	26.28	19.17	36
29-Mar-1990	7:32: 3	26.55	24.30	28
29-Mar-1990	18:44: 3	26.82	17.97	38
31-Mar-1990	7: 6:17	26.82	21.07	33
31-Mar-1990	20: 6: 9	27.37	17.93	38
1-Apr-1990	18:14:53	28.18	15.97	43
2-Apr-1990	6:49:48	28.18	14.20	49
2-Apr-1990	18:11:16	28.73	13.67	51
3-Apr-1990	6:40:23	28.46	10.70	65
3-Apr-1990	19:34:36	28.18	8.47	81
5-Apr-1990	19: 8:48	24.65	31.53	22
6-Apr-1990	7:40:47	24.65	19.70	35
6-Apr-1990	14:42:33	25.19	30.33	23
8-Apr-1990	18:37:29	27.64	13.73	51

Appendix 23. Continued.

DATE	TIME (GMT)	TEMP (C)	MEAN DIVE	NO. DIVE
9-Apr-1990	18:35:48	27.37	18.03	38
11-Apr-1990	6:54:21	26.82	15.43	45
11-Apr-1990	14:28:0	26.82	18.60	37
12-Apr-1990	17:59:19	27.64	21.63	32
13-Apr-1990	6:31:49	26.82	18.60	37
13-Apr-1990	17:44:58	26.28	14.60	47
14-Apr-1990	8:4:6	26.28	15.37	45
15-Apr-1990	17:28:31	27.09	20.27	34
17-Apr-1990	18:41:39	28.18	30.53	23
19-Apr-1990	7:2:50	28.18	12.00	58
20-Apr-1990	6:50:40	27.09	9.53	73
22-Apr-1990	6:30:27	25.73	11.23	62
23-Apr-1990	8:4:41	26.28	8.33	84
23-Apr-1990	19:15:4	28.46	5.73	120
24-Apr-1990	6:9:48	27.91	7.30	96
27-Apr-1990	7:23:19	26.01	18.43	38
28-Apr-1990	7:9:55	26.01	8.53	82
29-Apr-1990	6:58:12	26.28	14.20	49
2-May-1990	6:25:34	28.18	12.30	56
6-May-1990	7:25:3	28.46	13.57	51
7-May-1990	7:11:32	29.54	9.93	70
10-May-1990	19:35:27	29.00	3.77	186
12-May-1990	7:53:48	28.73	5.13	138
17-May-1990	18:23:29	30.09	5.00	140
18-May-1990	18:14:22	30.90	5.23	133
20-May-1990	8:7:28	29.54	8.60	82
20-May-1990	19:27:1	30.63	5.20	134
21-May-1990	14:22:58	29.82	7.80	88
22-May-1990	7:46:9	29.82	16.27	43
23-May-1990	7:34:47	29.82	27.10	26
24-May-1990	18:47:17	29.82	5.03	138
25-May-1990	7:16:26	28.73	7.93	87
25-May-1990	14:25:6	28.18	5.57	125
26-May-1990	18:24:25	27.64	10.90	63
28-May-1990	6:42:50	27.64	8.03	87
1-Jun-1990	19:5:0	30.90	13.07	53
4-Jun-1990	18:20:3	31.72	6.20	114
5-Jun-1990	7:1:28	31.72	7.80	90
5-Jun-1990	19:51:3	32.81	26.93	26
10-Jun-1990	7:40:51	30.09	15.70	45
10-Jun-1990	18:55:33	30.90	17.93	39

Appendix 24. Temperature and diving data collected from satellite telemetered turtle 4933. TIME in Greenwich mean time, TEMP = transmitter temperature in C, MEAN DIVE = mean dive duration in each 12 hour period, in minutes, NO. DIVE = number of dives in each 12 hour period.

DATE	TIME	TEMP (C)	MEAN DIVE	NO. DIVE
10-Nov-1989	11:42:48	18.10	13.47	46
10-Nov-1989	22:58:32	17.83	12.10	54
11-Nov-1989	0:38: 5	17.83	12.10	54
11-Nov-1989	8:29:42	17.57	19.53	33
11-Nov-1989	22:46:38	17.83	30.67	21
12-Nov-1989	0:28:22	17.83	30.67	21
12-Nov-1989	18:14:26	17.83	42.63	15
13-Nov-1989	1:44:17	17.83	55.60	12
13-Nov-1989	12:13: 3	17.30	51.40	13
14-Nov-1989	11:55:29	17.83	67.20	10
15-Nov-1989	13:18:12	17.57	52.33	13
16-Nov-1989	0:37:13	17.83	33.97	20
16-Nov-1989	19: 1: 6	18.36	56.50	12
18-Nov-1989	12: 2:31	17.83	40.03	17
19-Nov-1989	1: 3:55	16.78	36.50	19
19-Nov-1989	8:50:29	18.10	13.87	48
19-Nov-1989	23: 1:23	19.68	8.70	78
20-Nov-1989	11:19:49	18.89	13.67	50
21-Nov-1989	0:25:19	19.68	10.50	66
21-Nov-1989	8:23:32	18.89	13.03	53
22-Nov-1989	1:34:40	19.42	5.73	118
22-Nov-1989	17:58:19	18.89	30.47	22
23-Nov-1989	17:57: 1	17.57	25.57	27
23-Nov-1989	23: 5:38	17.30	17.77	39
24-Nov-1989	11:35:41	18.10	56.77	12
25-Nov-1989	14:29:51	17.30	57.03	12
25-Nov-1989	22:28:17	16.25	12.17	55
26-Nov-1989	9:17:49	16.51	22.23	31
27-Nov-1989	13:48:36	15.98	32.27	21
28-Nov-1989	0:59:45	16.78	11.10	60
28-Nov-1989	13:27:29	15.98	33.97	20
28-Nov-1989	20:19:23	15.98	43.10	16
30-Nov-1989	12:42:45	14.92	98.00	7
1-Dec-1989	1:28:34	14.92	86.03	8
2-Dec-1989	13:34:33	15.45	85.90	8
3-Dec-1989	17:52:11	14.66	86.87	8
4-Dec-1989	7:54:17	14.40	85.53	8
7-Dec-1989	13:20:21	15.45	76.57	9
8-Dec-1989	8:48:31	16.25	66.37	10
8-Dec-1989	20: 9:51	16.25	39.23	17
9-Dec-1989	18:25: 4	13.87	114.87	6
10-Dec-1989	13:46:31	11.49	97.20	7
12-Dec-1989	2:26:59	12.28	84.97	8
12-Dec-1989	11:29:12	13.07	67.93	10
14-Dec-1989	6:11: 7	12.81	97.97	7
14-Dec-1989	13:59:24	13.07	74.70	9

Appendix 24. Continued.

DATE	TIME (GMT)	TEMP (C)	MEAN DIVE	NO. DIVE
16-Dec-1989	14:55: 0	14.13	68.27	10
17-Dec-1989	0:38:51	14.13	74.87	9
17-Dec-1989	8:51:20	13.34	55.20	12
18-Dec-1989	14: 9:33	13.34	112.60	6
19-Dec-1989	6:51:56	12.28	73.53	9
19-Dec-1989	8:32:49	12.02	96.47	7
20-Dec-1989	13:23:19	11.49	111.90	6
21-Dec-1989	14:47:54	10.43	110.60	6
23-Dec-1989	19:21:15	9.90	132.13	5
23-Dec-1989	20:56:36	9.90	92.07	7
24-Dec-1989	13:40:50	9.37	124.07	5
24-Dec-1989	20:44:55	9.90	129.43	5
25-Dec-1989	13:17:35	10.16	105.63	6
26-Dec-1989	8:59:44	9.90	167.33	4
27-Dec-1989	1:42:19	9.37	108.80	6
27-Dec-1989	8:53: 2	10.16	161.47	4
28-Dec-1989	12: 0:40	11.49	171.77	4
28-Dec-1989	23:19:35	12.28	94.63	7
29-Dec-1989	19:44:37	12.54	136.33	5
31-Dec-1989	12:38:47	13.34	137.83	5
1-Jan-1990	6:20:33	12.81	115.13	6
3-Jan-1990	11:33:26	13.07	33.50	20
4-Jan-1990	14:29:21	13.60	62.40	11
5-Jan-1990	0: 5:11	13.60	76.17	9
5-Jan-1990	12:25:47	13.87	175.80	4
6-Jan-1990	13:39:27	14.66	62.33	11
8-Jan-1990	0:41: 0	14.92	235.60	3
8-Jan-1990	18: 0:36	15.72	58.10	12
9-Jan-1990	14:13:12	14.66	50.47	14
11-Jan-1990	19: 9:31	15.98	140.67	5
12-Jan-1990	0:48:15	16.25	77.00	9
12-Jan-1990	13:12:39	16.25	141.23	5
13-Jan-1990	0:16:31	17.57	86.83	8
14-Jan-1990	17: 2: 7	16.51	115.87	6
14-Jan-1990	23:33:51	15.98	116.60	6
15-Jan-1990	11:54:54	16.78	53.07	13
15-Jan-1990	20: 7:11	17.57	42.90	16
16-Jan-1990	14:53:17	17.57	45.67	15
17-Jan-1990	0:38: 0	17.57	117.80	6
18-Jan-1990	14:11:37	17.57	141.43	5
20-Jan-1990	1: 2:37	18.10	140.63	5
20-Jan-1990	13:20:53	17.83	141.83	5
21-Jan-1990	13: 5:32	17.83	141.33	5
26-Jan-1990	0:22:43	20.21	177.67	4
29-Jan-1990	19:27:44	18.89	100.03	7
30-Jan-1990	14:38:12	19.95	141.63	5
1-Feb-1990	12:13: 6	19.95	52.93	13
1-Feb-1990	20:33:55	19.95	141.80	5
2-Feb-1990	16:58:26	19.68	117.97	6
2-Feb-1990	20:20:21	19.68	141.83	5

Appendix 24. Continued.

DATE	TIME (GMT)	TEMP (C)	MEAN DIVE	NO. DIVE
3-Feb-1990	22:44:36	19.95	141.03	5
4-Feb-1990	7: 2:11	21.53	141.03	5
5-Feb-1990	14:10:27	21.53	78.67	9
6-Feb-1990	11:59: 3	20.21	58.23	12
8-Feb-1990	9:37:45	19.95	99.57	7
10-Feb-1990	20:35:10	21.53	101.37	7
11-Feb-1990	13:29:28	21.80	101.50	7
12-Feb-1990	0:37:36	22.06	118.60	6
12-Feb-1990	8:49:35	21.27	78.73	9
13-Feb-1990	2: 4:14	20.74	70.27	10
13-Feb-1990	18:24:41	20.74	101.13	7
14-Feb-1990	18: 5:44	21.27	101.23	7
15-Feb-1990	19:40:43	21.53	101.37	7
16-Feb-1990	17:53:30	22.06	63.80	11
17-Feb-1990	12:52:13	22.06	69.57	10
18-Feb-1990	20:50:15	22.33	63.43	11
19-Feb-1990	1:26:39	22.33	63.43	11
19-Feb-1990	13:53:43	22.33	78.37	9
21-Feb-1990	0:42:29	22.06	58.43	12
21-Feb-1990	20:21:54	20.74	49.43	14
24-Feb-1990	17:58:35	19.68	177.60	4
26-Feb-1990	12:51:28	19.42	140.63	5
27-Feb-1990	1:46:23	19.95	82.83	8
28-Feb-1990	17:18:34	19.95	100.57	7
28-Feb-1990	20:42:59	20.21	70.17	10
2-Mar-1990	18:45:35	19.68	142.37	5
7-Mar-1990	19:31:19	18.89	117.87	6
14-Mar-1990	19:53:49	19.95	177.97	4
15-Mar-1990	13: 5: 1	20.21	117.87	6
16-Mar-1990	12:43:27	19.16	115.90	6
18-Mar-1990	19:12: 8	19.42	100.27	7
20-Mar-1990	7:29: 4	20.21	61.90	11
20-Mar-1990	18:48:26	20.21	86.27	8
21-Mar-1990	20:17: 5	19.42	62.27	11
23-Mar-1990	6:54: 6	19.68	68.87	10
23-Mar-1990	18:13:27	19.68	57.47	12
24-Mar-1990	6:47: 4	18.89	57.70	12
24-Mar-1990	14:41:10	18.89	46.20	15
26-Mar-1990	6:24: 9	18.89	44.13	16
27-Mar-1990	23:10:43	19.16	58.23	12
29-Mar-1990	18:47:27	19.16	70.20	10
29-Mar-1990	20:31:38	18.89	38.87	18
30-Mar-1990	8:59:37	19.16	46.00	15
31-Mar-1990	12: 1: 0	18.89	63.07	11
1-Apr-1990	20: 5:29	18.63	15.30	46
2-Apr-1990	8:29: 3	19.68	29.00	24
3-Apr-1990	8:17:43	18.36	25.60	27
4-Apr-1990	6:24:16	18.63	29.83	23
4-Apr-1990	19:33:59	18.10	27.50	25
5-Apr-1990	7:55: 4	18.10	28.57	24

Appendix 24. Continued.

DATE	TIME (GMT)	TEMP (C)	MEAN DIVE	NO. DIVE
5-Apr-1990	13:24:40	17.57	26.23	26
5-Apr-1990	23: 0: 0	18.63	10.87	65
6-Apr-1990	17:24:36	18.36	28.40	24
6-Apr-1990	22:40:54	18.89	18.03	38
7-Apr-1990	12:36:27	18.63	29.63	20
7-Apr-1990	20:32:31	18.63	34.77	20
8-Apr-1990	18:40:12	18.63	38.53	18
8-Apr-1990	20:27:39	18.63	17.17	41
9-Apr-1990	11:51:46	18.10	19.83	35
9-Apr-1990	23:11:12	18.36	13.47	52
10-Apr-1990	18:24:14	18.10	38.53	18
12-Apr-1990	1:49:45	18.89	57.83	12
14-Apr-1990	8: 1: 7	18.36	63.17	11
14-Apr-1990	14:57:52	18.36	49.67	14
17-Apr-1990	9: 8:33	18.10	87.40	8
18-Apr-1990	7:13:58	18.63	13.73	50
18-Apr-1990	13:33:45	18.89	77.27	9
19-Apr-1990	13: 1:34	18.89	63.37	11
20-Apr-1990	0:24:10	18.89	69.83	10
21-Apr-1990	6:35:18	18.89	117.67	6
21-Apr-1990	6:35:58	19.16	117.67	6
22-Apr-1990	23:21:22	19.16	141.73	5
23-Apr-1990	22:50: 3	19.42	177.53	4
28-Apr-1990	7:10:31	19.95	177.50	4
28-Apr-1990	8:43:47	20.21	140.57	5
28-Apr-1990	20:12:39	22.06	5.63	119
29-Apr-1990	12:45: 6	21.01	13.10	53
1-May-1990	8: 9:19	20.48	14.37	47
2-May-1990	17:51:22	20.21	38.50	18
3-May-1990	17:35:12	21.80	63.53	11
3-May-1990	22:23:32	22.06	31.53	22
4-May-1990	17:22: 9	22.33	28.93	24
5-May-1990	13:41: 7	21.80	38.03	18
7-May-1990	0:40: 7	20.74	17.17	40
7-May-1990	22:40: 0	20.48	46.17	15
8-May-1990	8:42: 0	20.48	57.77	12
8-May-1990	23:50:57	21.01	6.27	108
9-May-1990	8:22:16	21.01	7.67	89
10-May-1990	19:36:41	22.86	28.97	24
12-May-1990	7:49:43	14.92	63.30	11
12-May-1990	11: 4:48	14.40	77.07	9
13-May-1990	1:43:38	14.13	36.27	19
14-May-1990	7:35:51	13.34	38.07	18
15-May-1990	11:35:55	17.04	38.13	18
17-May-1990	7: 0:26	18.36	22.20	31
17-May-1990	18:27: 2	19.16	32.47	21
18-May-1990	6:51:18	19.95	22.00	31
18-May-1990	8:35:21	19.68	27.40	25
18-May-1990	23:30: 1	19.42	16.77	41
19-May-1990	19:46:52	19.42	22.13	31

Appendix 24. Continued.

DATE	TIME (GMT)	TEMP (C)	MEAN DIVE	NO. DIVE
20-May-1990	8: 4:26	20.21	11.43	60
20-May-1990	11:21:46	19.68	9.23	74
21-May-1990	0:15:27	20.48	13.47	50
21-May-1990	12:31:34	20.48	21.37	32
22-May-1990	19: 8: 7	19.68	46.10	15
23-May-1990	5:52:33	19.42	42.70	16
23-May-1990	9:19:53	19.42	56.67	12
24-May-1990	7:19:50	19.42	33.80	20
24-May-1990	22:47:39	19.68	29.43	23
25-May-1990	14:22:13	19.68	32.83	21
25-May-1990	20:16:35	20.21	26.20	26
29-May-1990	6:26:35	18.89	116.93	6
29-May-1990	14:33:19	18.89	117.17	6
31-May-1990	17:29:46	19.42	41.13	17
1-Jun-1990	5:58: 8	19.16	13.93	50
3-Jun-1990	8:50:53	19.16	37.87	18
4-Jun-1990	13:56: 0	19.68	35.43	19
5-Jun-1990	6:56:21	21.80	22.43	30
5-Jun-1990	11:58:53	21.53	37.93	18
6-Jun-1990	6:40:13	20.74	22.20	31
6-Jun-1990	11:35:39	20.74	26.60	26
7-Jun-1990	19:39:50	21.27	33.77	20
8-Jun-1990	0: 4:33	21.01	11.43	61
8-Jun-1990	12:25:14	21.53	13.87	50
8-Jun-1990	22: 7:19	21.80	14.63	47
9-Jun-1990	11:57:17	22.59	28.00	24
10-Jun-1990	1: 3:38	24.97	11.77	58
10-Jun-1990	9:17:44	23.12	8.80	76
11-Jun-1990	0:35:11	22.06	20.40	33
11-Jun-1990	14:38:42	22.06	24.57	27
12-Jun-1990	0:19:12	23.39	23.30	28
12-Jun-1990	12:39: 2	22.59	18.77	35
13-Jun-1990	7: 7:38	22.06	19.47	34
13-Jun-1990	8:47:33	22.06	26.73	25
14-Jun-1990	1:10: 5	22.59	14.80	46
14-Jun-1990	8:30:54	22.06	24.53	27
15-Jun-1990	6:47:33	22.06	28.63	23
15-Jun-1990	14:44:35	22.06	22.20	30
15-Jun-1990	22:48:17	22.59	18.73	36
22-Jun-1990	8:52:41	25.24	14.17	24

Appendix 25. Temperature and diving data collected from satellite telemetered turtle 4934. TIME in Greenwich mean time, TEMP = transmitter temperature in C, MEAN DIVE = mean dive duration in each 12 hour period, in minutes, NO. DIVE = number of dives in each 12 hour period.

DATE	TIME	TEMP (C)	MEAN DIVE	NO. DIVE
23-Oct-1991	0:57:22	17.92	8.03	63
23-Oct-1991	13:16:33	16.67	4.53	151
24-Oct-1991	9:26:1	18.23	7.10	95
24-Oct-1991	12:57:20	18.54	14.30	46
25-Oct-1991	12:43:36	19.79	27.30	24
26-Oct-1991	12:14:31	20.42	29.77	22
27-Oct-1991	7: 9:23	20.42	12.43	52
27-Oct-1991	13:30:21	22.91	39.30	17
29-Oct-1991	0:36:4	21.35	29.63	22
29-Oct-1991	19:45:31	23.22	43.43	15
30-Oct-1991	0:15:6	21.98	9.53	68
30-Oct-1991	12:32:16	23.22	11.17	59
31-Oct-1991	12: 9:52	24.47	6.13	109
31-Oct-1991	12:10:32	24.47	27.43	24
1-Nov-1991	7:52:38	24.79	21.87	31
1-Nov-1991	15:13:11	25.72	33.13	19
2-Nov-1991	7:45:43	25.10	35.33	19
2-Nov-1991	17:20:20	25.72	99.47	07
3-Nov-1991	0:24:52	25.72	47.80	14
5-Nov-1991	13:54:40	24.16	100.20	07
6-Nov-1991	6:55:59	24.47	29.37	23
6-Nov-1991	19:55:19	24.47	116.70	06
10-Nov-1991	1:26:57	23.22	62.00	11
10-Nov-1991	19: 1:57	22.91	86.83	08
11-Nov-1991	15: 4:11	23.85	116.90	06
12-Nov-1991	12:57:6	23.54	116.70	06
14-Nov-1991	18:17:36	22.60	116.97	06
15-Nov-1991	8:23:9	21.04	66.47	10
20-Nov-1991	11:53:9	23.22	140.63	05
21-Nov-1991	13:21:44	24.16	116.87	06
25-Nov-1991	17:50:47	24.79	141.50	05
27-Nov-1991	0:22:4	24.16	76.67	09
28-Nov-1991	12:32:33	23.85	140.70	05
29-Nov-1991	13:49:21	23.54	85.27	08
30-Nov-1991	11:47:32	24.79	76.37	09
1-Dec-1991	12:59:53	23.85	141.47	05
4-Dec-1991	17:47:53	22.91	141.87	05
6-Dec-1991	19: 1:41	23.54	236.87	03
8-Dec-1991	18:48:38	22.91	237.77	03
9-Dec-1991	10:29:6	21.98	141.13	05
11-Dec-1991	18: 9:17	21.98	237.47	03
12-Dec-1991	12:32:10	22.29	141.77	05
13-Dec-1991	17:45:34	22.91	177.13	04
14-Dec-1991	19: 7:20	22.91	176.90	04
15-Dec-1991	0:51:12	22.91	98.70	07
16-Dec-1991	12:53:31	20.73	237.13	03

Appendix 25. Continued.

DATE	TIME (GMT)	TEMP (C)	MEAN DIVE	NO. DIVE
19-Dec-1991	13:33:55	22.91	233.30	03
22-Dec-1991	7:55:0	20.73	357.60	02
27-Dec-1991	12:25:13	23.54	177.87	04
28-Dec-1991	21:31:34	23.22	177.90	04
30-Dec-1991	0:30:56	25.10	237.67	03
30-Dec-1991	22:32:33	22.29	177.40	04
31-Dec-1991	17:31:43	31.96	236.07	03
1-Jan-1992	7:40:22	22.29	234.13	03
1-Jan-1992	20:49:53	21.98	235.80	03
3-Jan-1992	11:34:36	20.10	236.63	03
3-Jan-1992	14:49:55	21.35	237.50	03
4-Jan-1992	0:32:45	20.73	66.23	10
5-Jan-1992	19:52:43	22.29	177.17	04
7-Jan-1992	13:25:27	22.29	114.83	06
8-Jan-1992	8:5:5	21.04	55.17	12
10-Jan-1992	20:42:37	24.16	177.57	04
14-Jan-1992	14:25:59	21.66	237.73	03
18-Jan-1992	0:45:39	22.60	237.20	03
18-Jan-1992	13:6:58	21.98	237.40	03
19-Jan-1992	12:44:19	22.29	236.93	03
20-Jan-1992	7:13:36	21.66	116.07	06
22-Jan-1992	19:51:37	21.35	236.93	03
23-Jan-1992	8:29:38	21.04	176.03	04
23-Jan-1992	19:48:58	21.66	236.90	03
24-Jan-1992	12:30:37	21.66	237.57	03
27-Jan-1992	13:11:59	20.73	176.90	04
2-Feb-1992	12:40:36	19.48	354.43	02
4-Feb-1992	19:10:0	17.30	235.60	03
7-Feb-1992	0:12:53	18.86	349.37	02
7-Feb-1992	0:18:53	20.42	164.43	04
7-Feb-1992	12:35:2	21.98	85.80	06
12-Feb-1992	22:12:51	23.22	177.07	04
19-Feb-1992	17:46:42	21.35	357.83	02
20-Feb-1992	19:20:19	20.42	237.33	03
23-Feb-1992	12:4:23	21.98	236.93	03
24-Feb-1992	18:23:18	21.66	237.70	03
26-Feb-1992	10:3:6	21.66	237.30	03
27-Feb-1992	19:27:21	21.66	140.57	05
1-Mar-1992	9:13:46	19.79	44.97	15
2-Mar-1992	7:29:44	19.79	114.87	6
2-Mar-1992	14:10:4	20.73	176.13	4
3-Mar-1992	1:35:8	20.42	85.63	8
3-Mar-1992	13:46:3	20.73	85.87	8
4-Mar-1992	10:20:32	21.66	20.43	34
5-Mar-1992	22:46:13	24.16	233.93	3
6-Mar-1992	8:11:24	18.54	16.50	41
6-Mar-1992	12:43:47	20.42	18.33	36
7-Mar-1992	1:50:54	22.29	5.57	123
7-Mar-1992	12:26:58	18.86	33.37	16
8-Mar-1992	7:47:32	18.86	17.37	39

Appendix 25. Continued.

DATE	TIME (GMT)	TEMP (C)	MEAN DIVE	NO. DIVE
9-Mar-1992	23: 9:38	17.30	117.80	6
10-Mar-1992	0:43:46	18.54	58.50	12
11-Mar-1992	2: 3:47	15.42	76.93	9
12-Mar-1992	0: 6:49	15.73	141.27	5
17-Mar-1992	12:18:11	15.73	237.00	3
18-Mar-1992	13:40:10	15.11	357.63	2
20-Mar-1992	22:35: 3	16.36	170.80	4
21-Mar-1992	6:58:21	18.54	19.27	35
21-Mar-1992	12:27: 0	19.17	6.87	39
22-Mar-1992	1:24:38	19.48	6.53	100
22-Mar-1992	13:53:45	17.61	13.10	51
23-Mar-1992	6:33:10	20.10	52.77	13
24-Mar-1992	0:41:49	18.86	20.13	33
24-Mar-1992	13: 6:30	21.98	24.93	26
25-Mar-1992	0:31:48	21.66	6.30	106
25-Mar-1992	12:41:54	21.35	63.97	9
26-Mar-1992	12:29:17	19.48	237.23	3
28-Mar-1992	9: 0:10	20.42	115.23	6
29-Mar-1992	0:37: 5	19.79	85.23	8
30-Mar-1992	12:37: 0	20.42	174.13	4
31-Mar-1992	12:16: 0	21.04	48.07	14
1-Apr-1992	9:45: 4	21.35	76.43	9
2-Apr-1992	1: 0:38	21.35	55.87	12
3-Apr-1992	19:12:20	20.42	176.43	4
5-Apr-1992	13:53:20	21.66	115.20	6
6-Apr-1992	10:31:49	21.35	62.50	11
6-Apr-1992	13:35:12	21.35	139.93	5
7-Apr-1992	18:24:11	21.66	116.17	6
8-Apr-1992	8:20:22	18.86	76.33	9
8-Apr-1992	14:33:46	22.91	139.83	5
9-Apr-1992	1:47:32	20.10	59.97	10
10-Apr-1992	13:54:24	24.16	76.50	9
11-Apr-1992	9:34:39	20.42	14.57	47
11-Apr-1992	19: 9:56	17.92	14.77	44
12-Apr-1992	20:42:21	21.35	36.30	18
15-Apr-1992	8:43:18	13.86	34.97	19
16-Apr-1992	18:13:59	15.11	86.20	8
17-Apr-1992	8:14:57	11.99	55.93	12
18-Apr-1992	17:51:56	15.73	236.17	3
20-Apr-1992	17:26: 0	11.05	351.13	2
21-Apr-1992	18:56:40	9.49	345.60	2
23-Apr-1992	23:45:14	10.12	352.50	2
29-Apr-1992	23:23:20	13.24	99.40	7
2-May-1992	18:26:37	20.42	178.23	4
5-May-1992	13:23:19	21.35	177.87	4
6-May-1992	11:14:46	17.61	177.60	4
8-May-1992	12:10:17	11.99	174.73	4
11-May-1992	22:29:16	19.17	177.17	4
12-May-1992	14:13:25	13.55	237.13	3
17-May-1992	20:23:10	19.48	177.43	4

Appendix 25. Continued.

DATE	TIME (GMT)	TEMP (C)	MEAN DIVE	NO. DIVE
19-May-1992	1: 1:56	19.17	176.90	4
22-May-1992	9:44:56	15.73	26.53	26
23-May-1992	7:45:19	15.42	27.60	25
24-May-1992	7:44:57	15.73	26.60	26
26-May-1992	10:36:31	12.93	116.07	6
29-May-1992	19:40:20	12.93	173.13	4
30-May-1992	0:32:21	13.55	23.43	29
31-May-1992	12:20:23	14.17	13.63	51
31-May-1992	14: 9:45	14.49	32.67	21
1-Jun-1992	1:23:23	14.17	12.13	57
1-Jun-1992	13:44:35	15.73	14.47	47
2-Jun-1992	18:59:16	19.17	19.63	35

Appendix 26. Temperature and diving data collected from satellite telemetered turtle 4937. TIME in Greenwich mean time, TEMP = transmitter temperature in C, MEAN DIVE = mean dive duration in each 12 hour period, in minutes, NO. DIVE = number of dives in each 12 hour period.

DATE	TIME	TEMP (C)	MEAN DIVE	NO. DIVE
23-Oct-1991	0:54:28	16.31	3.23	145
23-Oct-1991	13:13:30	16.00	3.83	181
24-Oct-1991	0:36:21	16.31	3.03	225
24-Oct-1991	12:53:48	16.00	2.43	269
25-Oct-1991	2: 1:12	17.54	3.67	186
25-Oct-1991	12:35:39	17.85	15.33	42
26-Oct-1991	12:16:3	18.77	17.90	36
27-Oct-1991	1:11:45	18.16	4.13	159
27-Oct-1991	13:36:32	20.00	14.67	45
28-Oct-1991	0:56:46	18.77	4.17	156
29-Oct-1991	0:31:56	21.23	5.17	128
29-Oct-1991	12:56:13	20.00	10.43	62
30-Oct-1991	12:32:21	20.31	8.63	77
31-Oct-1991	13:49:34	22.77	22.17	30
1-Nov-1991	11:47:0	21.84	6.80	99
1-Nov-1991	13:29:22	22.77	20.87	32
2-Nov-1991	0:45:15	20.92	3.43	174
4-Nov-1991	1:50:2	21.84	68.90	10
4-Nov-1991	14: 9:19	21.84	117.03	06
5-Nov-1991	12:13:34	21.84	117.20	06
6-Nov-1991	11:47:33	21.84	12.37	54
7-Nov-1991	13: 1:9	21.84	117.07	06
8-Nov-1991	17:49:46	21.54	141.47	05
9-Nov-1991	12:24:2	20.31	63.50	11
10-Nov-1991	9:32:15	20.00	10.63	61
12-Nov-1991	14:37:53	19.39	117.23	06
13-Nov-1991	8:49:24	18.77	12.07	56
13-Nov-1991	12:40:28	19.08	58.40	12
14-Nov-1991	7: 4:10	19.39	18.70	36
15-Nov-1991	19:46:52	20.61	176.40	04
17-Nov-1991	14:37:28	19.39	176.87	04
18-Nov-1991	14:17:32	18.16	176.77	04
19-Nov-1991	13:55:17	19.69	63.27	11
21-Nov-1991	14:56:34	20.31	176.50	04
22-Nov-1991	7: 8:2	17.54	10.47	64
22-Nov-1991	12:51:2	18.16	63.67	11
23-Nov-1991	14:18:27	19.69	176.60	04
26-Nov-1991	7:58:38	21.54	116.83	06
26-Nov-1991	17:44:19	21.54	141.50	05
27-Nov-1991	17:33:50	20.61	141.33	05
28-Nov-1991	23:52:57	20.31	177.43	04
29-Nov-1991	20:26:24	20.31	177.27	04
30-Nov-1991	1: 8:59	20.31	68.33	10
2-Dec-1991	19:50:11	21.23	177.53	04
4-Dec-1991	1:26:17	19.39	77.50	09
4-Dec-1991	13:45:43	19.08	87.73	08

Appendix 26. Continued.

DATE	TIME (GMT)	TEMP (C)	MEAN DIVE	NO. DIVE
5-Dec-1991	20:54:9	19.08	177.53	04
6-Dec-1991	0:45:6	18.46	84.80	08
10-Dec-1991	13:16:5	15.39	140.40	05
15-Dec-1991	22:55:34	16.93	237.23	03
17-Dec-1991	9: 2:2	18.16	236.10	03
17-Dec-1991	14: 5:32	18.16	236.67	03
18-Dec-1991	12:15:56	21.23	141.87	05
22-Dec-1991	19:12:47	19.08	177.10	04
23-Dec-1991	19: 2:13	18.77	236.03	03
25-Dec-1991	14:38:56	20.92	177.67	04
30-Dec-1991	17:50:51	18.46	237.37	03
31-Dec-1991	1:53:32	18.16	175.00	04
1-Jan-1992	13:54:2	19.69	177.37	04
4-Jan-1992	10:23:39	18.16	61.50	11
5-Jan-1992	1:56:1	18.46	176.83	04
9-Jan-1992	7:45:17	15.70	74.17	09
9-Jan-1992	20:45:30	17.23	236.93	03
10-Jan-1992	1:44:21	18.46	176.27	04
12-Jan-1992	15: 4:10	20.00	357.30	02
13-Jan-1992	8:35:1	16.62	170.97	04
14-Jan-1992	12:47:15	16.00	237.27	03
20-Jan-1992	23:39:30	16.93	236.90	03
24-Jan-1992	8:12:41	15.39	116.47	06
25-Jan-1992	23:27:10	16.93	236.90	03
26-Jan-1992	13:27:21	16.00	358.30	02
30-Jan-1992	13:41:53	16.62	357.37	02
3-Feb-1992	12:25:22	14.77	357.30	02
7-Feb-1992	12:32:50	15.39	94.93	07
9-Feb-1992	13:34:22	17.54	357.90	02
14-Feb-1992	18:48:18	17.23	78.13	09
16-Feb-1992	22:29:49	13.54	356.77	02
19-Feb-1992	13:35:39	12.01	356.87	02
20-Feb-1992	22:44:27	12.62	235.53	03
25-Feb-1992	22:36:9	13.54	236.93	03
26-Feb-1992	12:35:31	17.54	117.93	06
27-Feb-1992	8:12:0	14.77	43.50	16
27-Feb-1992	17:52:7	20.00	175.57	04
1-Mar-1992	12:51:14	16.62	357.57	2
6-Mar-1992	9:52:57	16.93	225.53	3
7-Mar-1992	0: 7:34	18.16	237.00	3
8-Mar-1992	17:35: 9	19.69	237.53	3
9-Mar-1992	13:21:35	20.00	357.87	2
13-Mar-1992	18:13:46	20.31	237.97	3
15-Mar-1992	19:39: 6	20.31	237.70	3
20-Mar-1992	18:38:10	18.46	141.30	5
22-Mar-1992	1:28:46	19.08	176.70	4
23-Mar-1992	1:10:24	19.08	115.83	6
25-Mar-1992	2: 5:53	17.54	116.40	6
25-Mar-1992	19:14:30	16.93	176.80	4
1-Apr-1992	9:51:17	17.85	176.30	4

Appendix 26. Continued.

DATE	TIME (GMT)	TEMP (C)	MEAN DIVE	NO. DIVE
2-Apr-1992	21: 6:24	17.85	176.87	4
4-Apr-1992	20:32:19	18.77	54.10	13
5-Apr-1992	7:26:37	16.93	5.90	103
6-Apr-1992	1:17:34	16.31	40.47	17
6-Apr-1992	23: 6:40	13.85	140.23	5
7-Apr-1992	13: 5:59	13.24	19.27	35
8-Apr-1992	8:29:40	12.62	10.87	63
8-Apr-1992	14:29: 5	13.85	16.40	39
8-Apr-1992	19:45:39	16.62	16.40	38
9-Apr-1992	12:30:28	13.54	17.73	37
10-Apr-1992	19:26:37	13.85	24.20	28
11-Apr-1992	1: 5:47	13.54	9.10	76
13-Apr-1992	20:36:38	16.93	77.63	9
15-Apr-1992	13:38:14	20.92	54.20	13
16-Apr-1992	13:17:40	19.08	21.37	32
17-Apr-1992	9:59: 3	18.46	5.77	117
17-Apr-1992	12:53:38	18.16	57.73	12
18-Apr-1992	9:50:35	16.31	15.43	44
18-Apr-1992	19:34:35	16.93	17.00	41
19-Apr-1992	13:55:29	19.08	21.63	32
20-Apr-1992	11:58:20	21.23	5.93	115
21-Apr-1992	0:51: 1	18.16	8.10	82
21-Apr-1992	13:16:35	21.84	13.53	51
22-Apr-1992	12:52:32	18.77	20.40	33
23-Apr-1992	14:11:23	17.54	34.27	20
24-Apr-1992	1:36:47	17.23	6.83	93
25-Apr-1992	1:12:49	17.54	7.10	94
25-Apr-1992	13:27: 5	18.77	15.87	41
26-Apr-1992	0:41:54	19.39	4.57	139
26-Apr-1992	21:12:12	17.54	19.53	33
27-Apr-1992	21: 7:43	18.46	48.60	14
28-Apr-1992	12:21:10	16.62	16.33	39
28-Apr-1992	20:51:59	16.31	67.00	10
29-Apr-1992	1:27:23	15.70	13.10	49
2-May-1992	0:16:45	16.62	26.67	25
2-May-1992	19:59:23	18.46	34.43	20
3-May-1992	1:41:54	16.00	10.97	59
3-May-1992	13:57:53	16.93	23.27	27
6-May-1992	14:39:30	17.23	62.70	11
7-May-1992	9:26:41	16.93	36.00	19
9-May-1992	11:52:10	18.46	36.27	19
10-May-1992	0:50:35	18.77	7.50	90
11-May-1992	10:14:56	17.23	25.40	27
12-May-1992	0:15:31	16.93	26.93	24
14-May-1992	9:41:37	16.31	88.80	8
14-May-1992	20:58:40	16.00	118.10	6
15-May-1992	11:26:53	16.31	14.93	47
15-May-1992	14:42:21	14.47	10.70	65
16-May-1992	12:50:45	16.93	11.97	54
18-May-1992	12: 1:19	16.00	12.43	54

Appendix 26. Continued.

DATE	TIME (GMT)	TEMP (C)	MEAN DIVE	NO. DIVE
18-May-1992	18:33:44	17.85	15.10	46
19-May-1992	22:59:56	15.39	17.50	40
20-May-1992	8:20:16	13.85	45.87	15
22-May-1992	9:42:24	12.62	33.17	21
22-May-1992	19:20:49	14.16	28.77	24
25-May-1992	0:33:21	17.54	5.43	131
26-May-1992	0:10:41	16.62	46.10	15
28-May-1992	10:13:29	16.31	12.33	56
28-May-1992	23:12: 6	17.85	40.20	17
29-May-1992	9:59:41	17.54	7.90	88
29-May-1992	13: 4: 3	16.93	26.63	26
30-May-1992	9:45: 7	16.62	9.23	74
30-May-1992	19:32:52	16.93	17.50	38
31-May-1992	1:46:53	16.93	27.50	25
31-May-1992	20:56:45	16.00	22.70	30
1-Jun-1992	1:25:57	17.54	6.13	115
6-Jun-1992	13:32:44	19.08	58.77	12
7-Jun-1992	1: 2:24	18.16	8.37	80
8-Jun-1992	0:30:21	20.00	3.90	177
9-Jun-1992	7:52: 8	20.92	7.57	92
12-Jun-1992	18:35:50	23.07	70.80	10
13-Jun-1992	10:18:43	19.69	9.47	75
13-Jun-1992	14:32:43	20.92	10.57	64
14-Jun-1992	0: 7:30	21.54	10.57	64
14-Jun-1992	1:50:56	21.84	8.73	77
14-Jun-1992	12:30:10	21.54	16.03	42
15-Jun-1992	13:44:32	21.54	14.30	46
16-Jun-1992	1: 5:56	22.46	3.90	178
18-Jun-1992	7:41:22	21.23	5.17	132
18-Jun-1992	12:47: 5	21.23	16.37	40
19-Jun-1992	7:29:47	21.23	8.90	73
19-Jun-1992	13:55:58	21.54	17.13	38
20-Jun-1992	7:18:49	22.77	5.13	126
20-Jun-1992	18:39:17	22.15	5.67	117
21-Jun-1992	7: 1: 8	22.15	4.23	154
22-Jun-1992	8:31:40	21.23	9.43	69
22-Jun-1992	14:36:36	20.92	17.53	37
23-Jun-1992	1:58:48	21.23	6.07	107
23-Jun-1992	12:35:46	20.92	14.67	45
24-Jun-1992	8:11:52	20.92	6.40	101
24-Jun-1992	23:36:27	22.15	11.80	54
25-Jun-1992	1:11:28	21.84	4.70	138
25-Jun-1992	17:42:40	21.54	9.13	69
26-Jun-1992	0:51:31	22.46	4.30	154
26-Jun-1992	13:12:25	21.84	6.07	109
27-Jun-1992	0:28:13	21.84	6.53	99
27-Jun-1992	12:48:42	21.54	11.23	57
28-Jun-1992	1:50:32	22.15	3.90	170
28-Jun-1992	12:32:12	21.54	10.00	66
29-Jun-1992	1:27:12	22.46	6.90	95

Appendix 26. Continued.

DATE	TIME (GMT)	TEMP (C)	MEAN DIVE	NO. DIVE
29-Jun-1992	18:28:10	23.07	12.67	51
30-Jun-1992	8:34:56	22.46	6.43	101
30-Jun-1992	13:25:49	22.77	12.03	54
1-Jul-1992	10:10:14	22.77	5.60	114
1-Jul-1992	13: 4:22	23.07	12.83	51
3-Jul-1992	8: 4:38	22.77	6.40	102
3-Jul-1992	12:26:51	22.77	6.80	97
4-Jul-1992	1:19:18	23.07	10.10	65
4-Jul-1992	13:37:53	23.07	15.97	41
5-Jul-1992	1: 3:10	24.30	4.90	138
5-Jul-1992	19: 1:17	25.23	7.97	83
6-Jul-1992	20:31:41	24.00	12.83	51
7-Jul-1992	8:53:31	23.69	6.83	98
7-Jul-1992	12:36:46	23.38	9.17	71
8-Jul-1992	10:18:56	23.38	5.77	114
8-Jul-1992	13:55:10	24.00	8.50	78
9-Jul-1992	1:16:45	24.30	6.57	99
9-Jul-1992	1:17:28	24.30	6.57	103
10-Jul-1992	0:51:15	24.92	5.30	125
10-Jul-1992	13:20:40	24.92	5.90	114
11-Jul-1992	0:33:17	26.15	4.17	165
12-Jul-1992	1:54:38	26.15	5.57	122
12-Jul-1992	19:18:12	24.61	9.90	69
13-Jul-1992	12:14:17	24.92	5.57	123
13-Jul-1992	13:53:27	24.00	7.37	89
14-Jul-1992	7:32:39	24.92	7.37	91
14-Jul-1992	13:27:30	25.84	10.63	62
15-Jul-1992	13: 9:43	25.84	11.47	58
16-Jul-1992	0:30:35	24.61	7.77	86
16-Jul-1992	12:53:21	24.92	13.13	51
17-Jul-1992	12:24:57	24.92	6.03	112
17-Jul-1992	12:30: 6	24.92	11.23	59
18-Jul-1992	12: 2: 3	25.23	6.13	107
18-Jul-1992	13:46:18	25.53	10.90	60
19-Jul-1992	11:39:57	25.23	5.23	127
19-Jul-1992	13:27: 0	25.23	8.43	80
20-Jul-1992	13: 2:31	25.84	8.97	75
21-Jul-1992	2: 0:41	25.23	7.10	96
21-Jul-1992	12:38:30	25.84	10.37	64
22-Jul-1992	1:36:44	25.23	7.37	91
22-Jul-1992	14: 0:28	25.84	11.23	60
24-Jul-1992	8:48:16	23.69	7.53	90
24-Jul-1992	13:13:19	24.30	15.10	44
25-Jul-1992	8:37:11	25.23	8.40	79
26-Jul-1992	12:31:53	24.92	18.33	37
27-Jul-1992	12:16:33	24.61	11.33	60
27-Jul-1992	19:45:21	25.84	12.13	56
28-Jul-1992	1: 9:59	25.53	6.13	111
29-Jul-1992	7:50: 7	24.00	8.70	78
29-Jul-1992	13:14:40	24.00	14.37	47

Appendix 26. Continued.

DATE	TIME (GMT)	TEMP (C)	MEAN DIVE	NO. DIVE
30-Jul-1992	9:25:52	25.53	9.07	74
31-Jul-1992	9: 8:38	25.23	7.50	91
2-Aug-1992	13:28:22	24.92	13.63	50
3-Aug-1992	22:42:38	25.23	16.13	41
7-Aug-1992	7:46: 6	24.92	12.47	55
7-Aug-1992	19:12:18	24.92	17.20	39
8-Aug-1992	0:42:31	25.23	5.57	120
9-Aug-1992	14:19: 7	25.23	14.37	47
10-Aug-1992	23:31:38	25.84	14.73	46

Appendix 27. Temperature and diving data collected from satellite telemetered turtle 4935. TIME in Greenwich mean time, TEMP = transmitter temperature in C, MEAN DIVE = mean dive duration in each 12 hour period, in minutes, NO. DIVE = number of dives in each 12 hour period.

DATE	TIME	TEMP (C)	MEAN DIVE	NO. DIVE
29-Oct-1991	8:19:0	17.88	15.20	41
29-Oct-1991	19:46:5	17.88	54.73	12
30-Oct-1991	6:33:16	17.58	81.73	08
30-Oct-1991	22:16:26	17.28	81.47	08
31-Oct-1991	9:43:44	16.98	72.57	09
31-Oct-1991	17:42:53	17.28	50.37	13
1-Nov-1991	9:32:49	16.98	66.90	10
2-Nov-1991	22:46:28	17.88	45.53	15
4-Nov-1991	8:50:27	17.88	56.97	12
5-Nov-1991	23:26:8	18.79	16.40	40
6-Nov-1991	11:44:49	18.19	18.83	35
6-Nov-1991	19:51:5	19.09	45.07	15
7-Nov-1991	6:36:36	18.49	98.87	07
8-Nov-1991	19:27:13	18.19	48.07	14
9-Nov-1991	7:59:19	17.28	58.43	11
10-Nov-1991	1:29:16	17.88	52.27	13
10-Nov-1991	12: 6:33	16.98	62.37	11
12-Nov-1991	18:45:59	14.26	233.83	03
13-Nov-1991	20:15:51	13.96	97.40	07
14-Nov-1991	18:21:9	15.16	53.33	13
15-Nov-1991	13:36:4	14.56	21.03	31
15-Nov-1991	18: 6:46	15.77	8.47	78
16-Nov-1991	11:41:9	14.86	9.77	69
18-Nov-1991	6:13:5	14.56	175.93	04
19-Nov-1991	13:51:6	16.68	139.30	05
19-Nov-1991	20:41:25	15.47	139.60	05
22-Nov-1991	18:23:7	20.60	77.43	09
23-Nov-1991	12:30:9	19.70	63.33	11
24-Nov-1991	8:22:35	20.00	177.00	04
25-Nov-1991	13:26:52	19.40	140.53	05
28-Nov-1991	7:28:57	17.58	174.77	04
28-Nov-1991	20:34:47	17.58	174.07	04
1-Dec-1991	13: 5:15	18.19	77.47	09
1-Dec-1991	18:20:9	17.88	100.40	07
2-Dec-1991	12:37:39	18.19	87.27	08
4-Dec-1991	1:18:45	19.09	100.47	07
4-Dec-1991	8:10:5	19.09	99.83	07
4-Dec-1991	19:26:48	19.40	86.23	08
5-Dec-1991	17:39:2	16.68	176.63	04
6-Dec-1991	17:24:30	19.70	141.13	05
7-Dec-1991	18:52:46	19.40	117.57	06
8-Dec-1991	17: 2:49	15.77	58.20	12
9-Dec-1991	10:27:38	16.68	86.73	08
10-Dec-1991	0:52:24	19.40	141.93	05
14-Dec-1991	9:33:31	20.60	176.90	04
16-Dec-1991	7:28:2	18.49	176.83	04

Appendix 27. Continued.

DATE	TIME (GMT)	TEMP (C)	MEAN DIVE	NO. DIVE
17-Dec-1991	20:15:13	19.09	177.30	04
19-Dec-1991	10:11:34	13.65	176.93	04
20-Dec-1991	14:44:54	13.96	257.07	02
21-Dec-1991	14:29:35	14.56	355.90	02
22-Dec-1991	9:36:20	16.07	235.80	03
23-Dec-1991	7:43:44	16.98	98.87	07
24-Dec-1991	9:13:44	16.98	116.20	06
25-Dec-1991	8:57:21	12.14	175.73	04
28-Dec-1991	8:28:36	9.73	354.73	02
29-Dec-1991	8:10:54	12.45	112.03	06
30-Dec-1991	9:48:5	16.37	116.90	06
30-Dec-1991	17:43:47	18.19	75.43	06
2-Jan-1992	18:55:13	10.33	351.37	02
4-Jan-1992	18:24:41	11.24	42.23	16
6-Jan-1992	9:57:12	12.14	228.77	03
12-Jan-1992	8:45:30	17.58	176.23	04
12-Jan-1992	18:38:14	17.28	236.20	03
15-Jan-1992	9:59:42	18.49	139.60	05
17-Jan-1992	11:41:12	16.98	236.80	03
21-Jan-1992	10:23:55	14.86	176.53	04
23-Jan-1992	10: 5:13	13.65	356.43	02
23-Jan-1992	18: 8:49	13.35	135.07	05
24-Jan-1992	8: 4:50	13.65	110.40	06
27-Jan-1992	14:51:20	14.56	356.27	02
29-Jan-1992	0: 2:43	14.26	236.07	03
3-Nov-1992	18:12:41	15.77	87.23	08
3-Feb-1992	7:59:24	7.91	354.87	02
3-Feb-1992	17:39:40	7.61	88.73	06
3-Feb-1992	19:15:34	6.70	89.00	06
4-Feb-1992	7:47:16	5.80	125.47	04
5-Feb-1992	18:50:4	13.05	171.23	04
7-Feb-1992	20: 7:44	8.82	81.67	08
11-Feb-1992	0:29:23	10.93	233.63	03
13-Feb-1992	1:36:0	14.56	175.63	04
14-Feb-1992	13:25:45	15.16	356.37	02
16-Feb-1992	12:51:25	17.28	116.37	06
22-Feb-1992	23:35:39	14.26	235.73	03
24-Feb-1992	7: 7:31	14.26	139.20	05
26-Feb-1992	18: 5:44	13.96	113.93	06
28-Feb-1992	8: 6:3	14.26	354.27	02
29-Feb-1992	11:33:39	13.65	175.47	04
29-Feb-1992	22:57:28	13.65	103.20	6
1-Mar-1992	22:34: 9	13.05	236.53	3
6-Mar-1992	22:28:24	13.35	235.33	3
8-Mar-1992	12: 5:40	13.96	168.90	4
8-Mar-1992	19:12:33	15.16	68.23	10
9-Mar-1992	9:21:33	15.16	22.13	32
9-Mar-1992	20:43:47	15.47	58.70	12
11-Mar-1992	8:55: 1	15.47	25.47	27
12-Mar-1992	10:25:27	12.75	41.20	17

Appendix 27. Continued.

DATE	TIME (GMT)	TEMP (C)	MEAN DIVE	NO. DIVE
12-Mar-1992	20:14:12	12.45	78.60	9
13-Mar-1992	13:41:25	12.14	50.33	14
15-Mar-1992	19:34:26	10.63	19.07	37
16-Mar-1992	12:40:27	10.33	18.17	38
17-Mar-1992	1:34:20	9.42	16.60	42
17-Mar-1992	7:44:29	9.12	6.83	100
18-Mar-1992	1:14:14	10.33	8.33	84
18-Mar-1992	1:16:58	10.33	8.33	84
18-Mar-1992	7:35:20	9.73	27.83	25
18-Mar-1992	19: 2:32	10.93	15.40	46
19-Mar-1992	9: 7:19	10.03	14.07	50
19-Mar-1992	22:53:22	11.24	31.83	22
20-Mar-1992	7: 6:40	11.54	14.47	48
21-Mar-1992	0:14:32	9.73	25.40	27
21-Mar-1992	7: 2:40	9.42	62.93	11
22-Mar-1992	1:33:32	10.03	21.07	33
22-Mar-1992	13:48:39	8.82	17.57	39
23-Mar-1992	1:12:15	9.73	25.20	28
23-Mar-1992	8:11:22	9.42	19.23	36
23-Mar-1992	17:57: 0	9.42	12.13	57
24-Mar-1992	7:58: 8	8.52	25.13	27
24-Mar-1992	17:45: 5	8.82	21.33	32
25-Mar-1992	19: 9:12	8.82	17.17	41
26-Mar-1992	7:42: 6	10.03	17.60	39
26-Mar-1992	18:58: 3	10.63	95.97	7
27-Mar-1992	7:31:23	11.24	170.33	4
28-Mar-1992	20:19:23	13.65	235.80	3
30-Mar-1992	12:39:52	13.35	234.00	3
31-Mar-1992	18: 1:48	14.26	355.60	2
1-Apr-1992	8:14: 7	14.26	233.70	3
9-Apr-1992	14: 7:40	17.28	235.33	3
11-Apr-1992	1:10:35	16.98	234.77	3
12-Apr-1992	0:42:33	18.19	57.90	12
16-Apr-1992	11:44:13	15.16	69.23	10
16-Apr-1992	19:55:47	14.56	23.07	29
17-Apr-1992	10: 3:29	14.26	17.07	39
18-Apr-1992	12:34:45	13.35	40.20	17
20-Apr-1992	13:33:45	15.47	354.63	2
21-Apr-1992	9:14:36	12.75	86.47	8
22-Apr-1992	14:30: 7	12.45	171.50	4
22-Apr-1992	18:39:17	12.45	73.60	9
29-Apr-1992	12: 5:45	11.54	355.50	2
30-Apr-1992	9: 1:41	11.84	102.07	6
30-Apr-1992	18:41: 9	23.63	152.47	4
1-May-1992	11:23: 5	13.35	260.50	1
3-May-1992	8:26:58	18.49	176.63	4
5-May-1992	0:58: 0	14.86	99.53	7
7-May-1992	12:32:37	12.45	76.70	9
8-May-1992	1:36: 0	11.54	76.13	9
8-May-1992	9:14:53	11.84	85.43	8

Appendix 27. Continued.

DATE	TIME (GMT)	TEMP (C)	MEAN DIVE	NO. DIVE
10-May-1992	8:47:47	11.84	26.67	26
13-May-1992	1:30:53	12.45	173.43	4
15-May-1992	0:47:42	13.96	86.93	8
15-May-1992	9:28: 6	14.26	15.33	46
15-May-1992	20:45:14	14.26	15.80	45
16-May-1992	7:34:52	13.35	20.03	35
16-May-1992	19: 1:37	17.88	10.17	70
17-May-1992	18:47:19	17.28	43.60	16
18-May-1992	12: 1:33	17.58	57.90	12
18-May-1992	20:10: 3	17.88	11.77	60
19-May-1992	8:35:24	15.77	9.30	75
21-May-1992	9:57:44	13.96	87.30	8
22-May-1992	0: 0:47	14.56	40.50	17
22-May-1992	7:58:36	13.65	57.60	12
23-May-1992	1:19: 4	15.16	16.77	42
23-May-1992	23:15:56	18.79	20.57	34

Appendix 28. Temperature and diving data collected from satellite telemetered turtle 1235. TIME in Greenwich mean time, TEMP = transmitter temperature in C, MEAN DIVE = mean dive duration in each 12 hour period, in minutes, NO. DIVE = number of dives in each 12 hour period.

DATE	TIME	TEMP (C)	MEAN DIVE	NO. DIVE
5-Aug-1992	12:19:42	24.72	8.20	82
6-Aug-1992	7:57:35	24.72	8.77	79
6-Aug-1992	11:56:31	24.72	31.60	22
7-Aug-1992	20:47:56	24.36	20.33	34
8-Aug-1992	0:40:19	24.36	25.70	27
8-Aug-1992	12:58:22	24.36	15.23	13
8-Aug-1992	19: 1: 8	24.72	15.23	45
9-Aug-1992	0:13:14	24.00	10.83	63
9-Aug-1992	12:32:50	25.45	5.07	132
9-Aug-1992	23:49:44	25.45	4.40	157
10-Aug-1992	12:17: 3	25.45	3.70	187
11-Aug-1992	8:37: 1	25.45	5.97	114
11-Aug-1992	13:32:14	25.09	4.17	166
12-Aug-1992	0:52:58	24.72	16.20	42
13-Aug-1992	21:14:53	25.45	9.10	75
14-Aug-1992	0: 5: 6	25.45	13.93	48
15-Aug-1992	1:27:38	25.45	16.23	41
15-Aug-1992	12: 8:54	25.45	17.53	39
16-Aug-1992	19: 2:33	25.45	11.00	61
18-Aug-1992	10:34:22	26.18	5.77	120
18-Aug-1992	14:22:16	26.90	6.80	101
19-Aug-1992	0: 5:50	25.45	16.47	41
19-Aug-1992	14: 9:41	25.45	13.13	51
19-Aug-1992	23:41:39	24.72	20.03	33
21-Aug-1992	11:45:37	25.45	22.87	29
22-Aug-1992	0:36:24	25.45	8.10	81
22-Aug-1992	19:25:39	27.27	16.57	41
23-Aug-1992	0:20:20	25.45	5.93	115
23-Aug-1992	12:42: 4	26.18	19.80	34
24-Aug-1992	9:27:12	25.09	6.40	103
24-Aug-1992	19: 2:35	26.90	21.10	29
25-Aug-1992	1:20:54	25.45	5.40	126
25-Aug-1992	11:59:30	26.18	13.43	50
25-Aug-1992	23:12:33	25.81	20.47	33
26-Aug-1992	14:58:10	26.90	12.33	55
27-Aug-1992	0:38:46	26.54	10.10	65
27-Aug-1992	14:29:59	27.27	9.33	71
28-Aug-1992	10:19:27	26.90	17.97	37
29-Aug-1992	8:24: 6	26.90	16.73	40
29-Aug-1992	12:18:31	26.54	16.23	41

Appendix 29. Temperature and diving data collected from satellite telemetered turtle 4931. TIME in Greenwich mean time, TEMP = transmitter temperature in C, MEAN DIVE = mean dive duration in each 12 hour period, in minutes, NO. DIVE = number of dives in each 12 hour period.

DATE	TIME	TEMP (C)	MEAN DIVE	NO. DIVE
4-Oct-1989	6:50:26	29.53	119.93	6
4-Oct-1989	13:56:50	27.97	25.53	28
5-Oct-1989	1:19: 6	22.50	34.33	11
5-Oct-1989	15: 9:51	22.23	2.97	195
6-Oct-1989	14:47:40	21.45	4.43	128
7-Oct-1989	6:21:50	21.45	2.00	264
7-Oct-1989	14:25:48	21.19	3.10	188
8-Oct-1989	17:29: 9	21.19	1.17	496
9-Oct-1989	1:20:46	21.45	1.13	438
9-Oct-1989	13:39: 1	21.45	1.57	414
9-Oct-1989	19: 6:51	21.71	1.57	398
10-Oct-1989	13:17:58	28.49	1.53	415
11-Oct-1989	14:39:10	25.36	1.50	423
12-Oct-1989	14:14:50	26.40	1.63	312
13-Oct-1989	1:32:57	23.28	1.47	329
13-Oct-1989	13:51:38	23.28	1.93	251
15-Oct-1989	6:32:57	23.02	1.80	266
15-Oct-1989	16:17:32	23.28	1.80	158
16-Oct-1989	6:18: 9	24.84	1.37	271
16-Oct-1989	14:20:45	23.54	2.43	179
17-Oct-1989	1:45: 3	23.02	1.60	206
17-Oct-1989	14: 0: 1	23.28	3.47	146
18-Oct-1989	13:37:22	23.02	4.53	137
19-Oct-1989	13:20:35	22.50	7.57	86
20-Oct-1989	14:33:43	23.02	1.67	292
21-Oct-1989	7: 8:39	22.76	1.27	235
21-Oct-1989	14:12:42	22.50	8.73	73
22-Oct-1989	1:30:34	21.97	1.53	227
22-Oct-1989	13:48:46	21.71	7.03	83
23-Oct-1989	6:45:24	23.02	2.83	87
23-Oct-1989	13:30:22	21.71	13.70	46
24-Oct-1989	16:26:26	21.71	5.30	118
25-Oct-1989	17:57:12	21.19	5.43	114
26-Oct-1989	13:56:45	20.93	4.97	134
27-Oct-1989	13:36:23	17.81	5.53	119
28-Oct-1989	5:56:38	16.76	1.80	260
28-Oct-1989	13:21: 4	17.29	3.33	184
29-Oct-1989	5:43:28	16.76	3.83	90
29-Oct-1989	14:29: 6	18.85	4.90	115
30-Oct-1989	14:11:45	18.85	39.13	15
31-Oct-1989	5:25: 2	17.03	3.13	99
31-Oct-1989	13:48:56	17.29	9.27	70
2-Nov-1989	16:32:22	17.29	38.40	17
3-Nov-1989	6:37:34	17.29	3.57	154
3-Nov-1989	14:20:31	17.03	5.27	126
4-Nov-1989	13:58:59	17.29	8.97	72

Appendix 29. Continued.

DATE	TIME (GMT)	TEMP (C)	MEAN DIVE	NO. DIVE
6-Nov-1989	14:50:48	16.50	75.10	9
7-Nov-1989	17:14:20	17.29	85.17	8
9-Nov-1989	5:29:36	17.81	25.60	26
10-Nov-1989	13:21:46	17.55	20.43	32
11-Nov-1989	6:53:33	17.81	7.63	87
11-Nov-1989	14:37:54	17.81	6.00	99
12-Nov-1989	16:25:45	18.33	21.00	32
13-Nov-1989	1:40:15	18.07	12.13	40
13-Nov-1989	13:51:40	18.07	6.20	98
14-Nov-1989	6:27:25	17.81	3.10	112
14-Nov-1989	13:31:57	17.29	15.70	43
15-Nov-1989	14:49:12	18.59	15.20	45
16-Nov-1989	5:54: 5	18.59	19.97	34
17-Nov-1989	14: 4: 2	17.03	16.53	41
18-Nov-1989	5:39:54	17.55	2.80	148
18-Nov-1989	13:40:35	17.29	25.27	27
19-Nov-1989	7: 2:58	20.93	4.40	155
19-Nov-1989	13:20:15	18.59	36.50	19
20-Nov-1989	14:35:44	20.15	61.43	10
21-Nov-1989	14:12: 1	18.59	43.13	15
22-Nov-1989	13:57:19	18.85	99.67	6
23-Nov-1989	17:53:11	17.55	57.60	12
24-Nov-1989	14:47:18	17.55	14.43	42
25-Nov-1989	14:30:57	19.89	25.30	24
27-Nov-1989	13:46:16	20.41	75.70	9
29-Nov-1989	14:34:36	18.59	69.53	10
2-Dec-1989	13:34:38	17.03	139.47	5
3-Dec-1989	17:41:22	21.45	68.67	10
4-Dec-1989	6: 9:50	21.19	48.27	14
5-Dec-1989	17:19: 9	19.37	57.67	12
7-Dec-1989	13:22:36	18.07	77.50	9
8-Dec-1989	16:51:23	19.37	81.63	5
9-Dec-1989	1:54:22	19.63	64.63	6
9-Dec-1989	14: 9:57	18.85	61.63	7
10-Dec-1989	6:50: 6	19.11	86.57	3
10-Dec-1989	16:29:50	18.07	91.97	7
16-Dec-1989	5:45:36	17.81	131.30	5
16-Dec-1989	13:22:24	16.24	117.47	5
17-Dec-1989	7:11:20	18.07	145.13	2
17-Dec-1989	16:55:27	16.50	142.27	4
18-Dec-1989	14: 5:46	15.72	153.10	4
20-Dec-1989	13:21:16	17.03	236.63	3
21-Dec-1989	14:44: 0	17.81	197.23	3
22-Dec-1989	14:22:12	15.72	221.43	3
23-Dec-1989	13:51:30	14.94	206.53	3
24-Dec-1989	13:31:21	13.90	161.43	4
25-Dec-1989	17: 8:30	18.59	172.27	3
27-Dec-1989	14: 2:42	19.89	173.83	4
28-Dec-1989	13:48:54	21.97	98.93	7
29-Dec-1989	6:42: 8	14.68	76.23	9

Appendix 29. Continued.

DATE	TIME (GMT)	TEMP (C)	MEAN DIVE	NO. DIVE
29-Dec-1989	15: 1:55	16.50	171.27	4
31-Dec-1989	14:17:17	21.71	7.07	90
1-Jan-1990	17:43:55	20.67	14.93	45
2-Jan-1990	6: 5:23	19.63	76.47	9
3-Jan-1990	17:23:20	18.33	176.30	4
5-Jan-1990	1:41:21	18.33	136.00	5

Appendix 30. Temperature and diving data collected from satellite telemetered turtle 1228. TIME in Greenwich mean time, TEMP = transmitter temperature in C, MEAN DIVE = mean dive duration in each 12 hour period, in minutes, NO. DIVE = number of dives in each 12 hour period.

DATE	TIME	TEMP (C)	MEAN DIVE	NO. DIVE
19-Sep-1991	1: 5:52	24.12	2.60	28
19-Sep-1991	11:44:7	23.73	15.70	41
19-Sep-1991	23: 9:35	24.12	4.30	37
20-Sep-1991	11:22:22	23.33	21.27	29
20-Sep-1991	22:46:3	23.33	1.73	158
21-Sep-1991	11: 4:16	22.93	20.07	26
21-Sep-1991	22:25:15	22.53	1.23	126
22-Sep-1991	12:24:48	22.13	4.83	81
23-Sep-1991	8:44:31	21.33	1.53	124
23-Sep-1991	12: 0:17	22.13	47.67	11
24-Sep-1991	1: 1:59	20.53	1.60	108
24-Sep-1991	11:38:37	22.13	1.60	38
24-Sep-1991	23: 2:33	20.93	1.33	144
25-Sep-1991	11:24:55	22.13	1.40	38
25-Sep-1991	22:46:9	22.53	1.20	23
26-Sep-1991	11: 3:57	22.53	46.17	05
26-Sep-1991	22:24:43	22.93	1.90	10
27-Sep-1991	12:18:34	22.93	6.13	62
27-Sep-1991	23:38:40	27.32	1.27	59
28-Sep-1991	13:33:39	28.12	3.67	132
29-Sep-1991	9: 5:23	26.12	1.37	13
29-Sep-1991	11:35:0	26.92	6.67	74
29-Sep-1991	22:55:40	26.12	1.33	95
30-Sep-1991	11:15:19	26.12	8.83	68
30-Sep-1991	22:41:7	26.12	1.37	100
1-Oct-1991	10:56:25	26.52	9.27	65
2-Oct-1991	6:53:36	26.12	1.37	119
2-Oct-1991	12:13:24	26.52	6.77	90
3-Oct-1991	11:49:55	26.12	18.47	29
4-Oct-1991	0:53:49	26.12	2.07	79
4-Oct-1991	11:36:4	26.52	17.60	30
5-Oct-1991	9:38:55	26.52	1.47	119
5-Oct-1991	11: 8:56	26.92	31.90	20
6-Oct-1991	10:48:30	26.12	40.23	16
7-Oct-1991	10:32:38	25.72	8.10	76
8-Oct-1991	1:16:1	25.32	1.40	100
8-Oct-1991	11:46:14	25.32	12.70	49
8-Oct-1991	23:12:23	24.92	1.60	108
9-Oct-1991	11:28:24	24.92	8.20	56
9-Oct-1991	22:52:11	24.12	1.67	63
10-Oct-1991	11: 7:30	24.52	11.33	50
11-Oct-1991	6:49:46	25.32	1.50	74
11-Oct-1991	10:49:20	25.32	6.60	92
12-Oct-1991	6:44:51	24.12	1.53	106
12-Oct-1991	10:24:51	25.72	7.83	29
13-Oct-1991	6:23:46	25.72	1.83	44

Appendix 30. Continued.

DATE	TIME (GMT)	TEMP (C)	MEAN DIVE	NO. DIVE
13-Oct-1991	11:50:11	26.12	5.33	101
14-Oct-1991	6:11:45	25.32	2.00	74
14-Oct-1991	11:25:0	25.72	11.97	31

Appendix 31. Temperature and diving data collected from satellite telemetered turtle 1230. TIME in Greenwich mean time, TEMP = transmitter temperature in C, MEAN DIVE = mean dive duration in each 12 hour period, in minutes, NO. DIVE = number of dives in each 12 hour period.

DATE	TIME	TEMP (C)	MEAN DIVE	NO. DIVE
18-Sep-1991	23:21:13	22.35	2.63	88
19-Sep-1991	11:44:1	23.53	3.07	90
19-Sep-1991	23: 2:55	23.53	1.97	158
20-Sep-1991	11:23:9	22.74	8.10	47
20-Sep-1991	22:51:34	19.22	2.80	165
21-Sep-1991	12:42:21	19.61	1.97	170
22-Sep-1991	0: 3:36	19.61	2.70	123
22-Sep-1991	12:22:19	19.22	2.67	129
23-Sep-1991	1:24:12	19.22	7.43	90
23-Sep-1991	12: 7:42	20.78	2.40	222
24-Sep-1991	6:45:8	20.39	3.00	158
24-Sep-1991	11:45:9	20.39	8.20	73
24-Sep-1991	23: 2:24	20.39	3.83	124
25-Sep-1991	17:57:19	22.35	5.03	110
25-Sep-1991	22:39:2	20.78	9.77	57
26-Sep-1991	12:42:36	20.39	28.50	13
27-Sep-1991	1:36:44	20.00	1.97	28
27-Sep-1991	12:19:19	20.78	37.03	08
27-Sep-1991	23:45:44	20.00	2.13	129
28-Sep-1991	13:38:56	21.18	22.50	11
28-Sep-1991	23:23:25	20.00	2.57	140
29-Sep-1991	11:40:53	20.00	14.37	23
30-Sep-1991	9: 5:53	19.61	2.90	96
30-Sep-1991	11:19:29	19.61	26.40	11
1-Oct-1991	0:14:36	19.61	3.43	63
1-Oct-1991	10:28:35	19.22	30.77	07
1-Oct-1991	22:16:27	18.82	5.17	59
2-Oct-1991	10:16:9	19.61	71.40	02
3-Oct-1991	1:18:55	19.61	7.77	60
3-Oct-1991	13:33:53	19.61	52.50	04
3-Oct-1991	23:20:20	19.61	8.43	41
4-Oct-1991	11:34:36	19.22	15.67	10
5-Oct-1991	0:36:20	19.61	3.07	80
5-Oct-1991	22:38:29	19.61	3.33	126
6-Oct-1991	12:39:30	19.61	10.93	15
6-Oct-1991	23:52:13	18.43	6.67	67
7-Oct-1991	12:10:8	18.04	38.57	05
7-Oct-1991	23:30:54	18.04	5.47	111
8-Oct-1991	13:26:29	18.82	36.63	09
8-Oct-1991	23:11:35	14.91	5.47	54
9-Oct-1991	11:32:45	17.65	9.87	14
9-Oct-1991	22:52:27	18.04	6.17	49
10-Oct-1991	10:25:0	17.65	24.53	02
11-Oct-1991	0:16:12	17.65	26.63	04
11-Oct-1991	18:18:23	21.18	27.73	02
11-Oct-1991	23:49:33	18.04	37.07	09

Appendix 31. Continued.

DATE	TIME (GMT)	TEMP (C)	MEAN DIVE	NO. DIVE
12-Oct-1991	12: 4:36	15.30	27.80	04

Appendix 32. Temperature and diving data collected from satellite telemetered turtle 1231. TIME in Greenwich mean time, TEMP = transmitter temperature in C, MEAN DIVE = mean dive duration in each 12 hour period, in minutes, NO. DIVE = number of dives in each 12 hour period.

DATE	TIME	TEMP (C)	MEAN DIVE	NO. DIVE
29-Sep-1991	23:3:1	19.57	3.27	12
1-Oct-1991	8:54:23	20.00	3.10	09
1-Oct-1991	10:59:3	20.00	10.47	11
1-Oct-1991	22:16:15	20.87	3.57	71
2-Oct-1991	10:16:29	20.43	12.40	45
3-Oct-1991	11:50:15	20.43	29.30	14
4-Oct-1991	0:57:33	20.43	5.37	19
4-Oct-1991	11:38:43	20.00	33.67	20
4-Oct-1991	22:52:0	21.30	2.60	81

Appendix 33. Temperature and diving data collected from satellite telemetered turtle 1233. TIME in Greenwich mean time, TEMP = transmitter temperature in C, MEAN DIVE = mean dive duration in each 12 hour period, in minutes, NO. DIVE = number of dives in each 12 hour period.

DATE	TIME	TEMP (C)	MEAN DIVE	NO. DIVE
18-Sep-1991	23:31:4	23.58	5.97	57
19-Sep-1991	11:51:57	23.97	33.47	18
19-Sep-1991	23: 1:48	23.97	1.77	180
20-Sep-1991	13: 5:22	23.97	17.13	37
20-Sep-1991	22:44:45	23.97	2.83	170
21-Sep-1991	12:39:41	23.20	25.07	26
21-Sep-1991	22:24:25	23.20	2.50	201
22-Sep-1991	12:22:41	23.58	15.73	31
23-Sep-1991	1:30:32	23.20	3.27	123
23-Sep-1991	12: 0:0	23.58	17.50	25
23-Sep-1991	23:22:2	23.20	4.37	128
24-Sep-1991	11:38:34	23.20	14.23	38
24-Sep-1991	23: 5:20	23.20	2.97	118
25-Sep-1991	11:21:12	23.20	12.10	52
26-Sep-1991	11: 2:23	22.81	23.97	27
26-Sep-1991	22:24:47	23.58	3.13	49
27-Sep-1991	12:15:57	23.20	11.50	35
28-Sep-1991	1:17:12	22.43	3.20	42
28-Sep-1991	13:35:57	22.81	28.20	08
29-Sep-1991	0:53:42	22.05	3.70	66
29-Sep-1991	11:34:31	22.43	22.90	27
30-Sep-1991	7:19:40	22.05	3.33	103
30-Sep-1991	11:20:29	22.43	22.77	28
30-Sep-1991	22:35:2	22.81	3.13	64
1-Oct-1991	10:27:36	22.43	24.30	26
1-Oct-1991	22:16:6	23.20	1.80	80
2-Oct-1991	12:12:43	22.43	25.90	25
3-Oct-1991	1:13:33	22.43	2.83	100
3-Oct-1991	12: 0:18	22.43	19.67	29
3-Oct-1991	23:17:3	22.43	2.03	67
4-Oct-1991	11:31:56	22.43	32.30	18
4-Oct-1991	22:50:0	23.20	2.80	192
5-Oct-1991	11:11:18	22.81	13.67	41
5-Oct-1991	22:30:41	22.81	2.27	146
6-Oct-1991	12:31:3	22.81	19.70	32
7-Oct-1991	12: 8:52	21.66	25.97	25
7-Oct-1991	23:27:31	22.05	2.47	170
8-Oct-1991	11:52:1	22.05	76.80	06
8-Oct-1991	23:10:53	21.66	3.07	124
9-Oct-1991	13: 7:45	22.43	49.33	11
10-Oct-1991	2:12:47	21.28	3.77	118
10-Oct-1991	10:22:24	20.51	51.70	07
11-Oct-1991	0: 3:26	20.13	2.37	128
11-Oct-1991	12:35:25	21.28	17.17	27
12-Oct-1991	1:28:46	22.81	1.30	15
12-Oct-1991	12: 3:42	25.50	10.23	52

Appendix 33. Continued.

DATE	TIME (GMT)	TEMP (C)	MEAN DIVE	NO. DIVE
13-Oct-1991	6:31:11	27.04	1.53	83
13-Oct-1991	11:46:26	27.04	10.13	61
14-Oct-1991	0:50:35	26.27	1.87	131
14-Oct-1991	11:21:51	26.65	25.80	21
15-Oct-1991	0:25:58	26.65	2.90	72
15-Oct-1991	11: 1:33	26.65	18.67	22
15-Oct-1991	22:24:18	26.27	2.53	120
16-Oct-1991	10:45:43	26.27	22.70	25
16-Oct-1991	23:42:33	25.50	1.87	67

Appendix 34. Temperature and diving data collected from satellite telemetered turtle 1234. TIME in Greenwich mean time, TEMP = transmitter temperature in C, MEAN DIVE = mean dive duration in each 12 hour period, in minutes, NO. DIVE = number of dives in each 12 hour period.

DATE	TIME	TEMP (C)	MEAN DIVE	NO. DIVE
19-Sep-1991	11:50:28	22.04	6.40	98
19-Sep-1991	23: 9:28	22.85	2.60	76
20-Sep-1991	11:24:41	22.04	5.93	100
21-Sep-1991	12:41:51	21.22	21.10	30
21-Sep-1991	22:28:16	21.22	1.97	183
22-Sep-1991	12:20:36	21.22	23.07	28
23-Sep-1991	6:56:44	21.22	1.73	228
23-Sep-1991	11:59:0	21.22	8.13	81
24-Sep-1991	6:45:11	21.63	2.93	192
24-Sep-1991	11:38:0	22.04	32.17	21
25-Sep-1991	0:49:23	22.04	2.03	219
25-Sep-1991	11:27:5	22.45	17.90	37

Appendix 35. Temperature and diving data collected from satellite telemetered turtle 4936. TIME in Greenwich mean time, TEMP = transmitter temperature in C, MEAN DIVE = mean dive duration in each 12 hour period, in minutes, NO. DIVE = number of dives in each 12 hour period.

DATE	TIME	TEMP (C)	MEAN DIVE	NO. DIVE
24-Oct-1991	0:34:36	21.68	2.03	163
24-Oct-1991	12:54:59	22.00	2.60	172
25-Oct-1991	0:12:7	21.68	1.87	232
25-Oct-1991	12:33:23	21.37	2.20	213
26-Oct-1991	7:12:39	21.68	2.47	199
26-Oct-1991	12:11:37	21.68	3.13	153
27-Oct-1991	1:12:1	22.32	2.27	267
27-Oct-1991	13:32:8	22.00	7.40	72
28-Oct-1991	6:51:0	20.41	2.27	235
28-Oct-1991	13:15:45	21.05	2.20	256
29-Oct-1991	12:48:20	19.78	6.00	101
30-Oct-1991	0:20:8	20.41	5.10	127
30-Oct-1991	12:38:32	19.15	10.57	62
31-Oct-1991	1:37:54	19.78	4.30	140
31-Oct-1991	12:15:0	19.78	2.83	147
1-Nov-1991	1:10:50	19.46	3.67	116
1-Nov-1991	13:32:8	19.15	4.47	121
2-Nov-1991	0:49:35	18.51	3.77	164
2-Nov-1991	13: 8:52	18.51	3.50	187
3-Nov-1991	0:30:21	17.24	2.53	210
3-Nov-1991	12:43:46	19.46	3.30	164
4-Nov-1991	0: 4:7	18.51	3.73	158
4-Nov-1991	12:23:56	19.15	3.47	187
5-Nov-1991	1:32:38	18.83	3.43	128
5-Nov-1991	12: 7:57	17.88	1.83	64
6-Nov-1991	1: 3:58	18.83	6.03	20
6-Nov-1991	13:21:58	18.83	2.87	173
7-Nov-1991	0:41:58	18.19	2.73	120
7-Nov-1991	13: 1:51	18.51	2.73	209
8-Nov-1991	0:24:37	18.19	3.17	74
8-Nov-1991	12:50:5	24.22	2.53	79
9-Nov-1991	0: 5:38	19.15	3.57	170
9-Nov-1991	20:56:17	16.92	46.43	14
10-Nov-1991	1:24:27	17.88	41.47	10
10-Nov-1991	13:39:55	18.83	4.50	64
11-Nov-1991	7:27:38	16.92	12.30	14
11-Nov-1991	13:23:28	16.29	2.17	114
12-Nov-1991	0:39:41	18.19	3.67	95
12-Nov-1991	12:58:43	17.88	5.33	64
13-Nov-1991	0:20:6	17.88	3.83	97
13-Nov-1991	12:39:48	17.24	5.50	98
14-Nov-1991	1:38:31	18.83	6.40	51
14-Nov-1991	12:16:51	16.61	6.53	85
15-Nov-1991	6:41:10	19.46	7.07	22
15-Nov-1991	12: 5:7	16.29	5.13	118
16-Nov-1991	0:54:11	20.10	35.57	03

Appendix 35. Continued.

DATE	TIME (GMT)	TEMP (C)	MEAN DIVE	NO. DIVE
16-Nov-1991	13:13:14	21.05	2.13	189
17-Nov-1991	0:31:24	21.37	2.00	214
17-Nov-1991	12:59:37	22.32	2.77	109
18-Nov-1991	7:48:38	18.51	2.23	249
18-Nov-1991	12:40:14	17.88	5.87	109
19-Nov-1991	1:40:25	17.56	3.33	70
19-Nov-1991	12:11:9	16.92	2.60	225
20-Nov-1991	1:11:41	16.61	1.90	127
20-Nov-1991	13:28:30	19.46	2.47	186
21-Nov-1991	0:53:33	16.29	4.53	22
21-Nov-1991	13: 8:57	17.56	2.43	114
22-Nov-1991	0:31:53	17.24	1.80	180
22-Nov-1991	12:50:52	17.56	2.43	214
23-Nov-1991	0: 6:57	21.05	2.20	92
23-Nov-1991	12:31:2	20.73	1.73	291
24-Nov-1991	1:33:45	23.90	1.93	83
24-Nov-1991	12: 5:36	24.54	2.70	141
25-Nov-1991	6:28:58	24.22	2.20	180
25-Nov-1991	13:24:51	25.81	2.87	136
26-Nov-1991	7:56:30	23.27	2.10	235
26-Nov-1991	13: 3:48	24.22	3.00	137
26-Nov-1991	19:18:33	22.00	3.00	137
27-Nov-1991	7:42:52	22.63	4.27	44
27-Nov-1991	12:46:9	19.78	2.57	221
28-Nov-1991	0: 9:54	22.95	3.97	42
28-Nov-1991	12:22:31	25.81	3.17	184
29-Nov-1991	7:17:45	24.22	1.70	211
29-Nov-1991	12: 6:25	22.00	2.43	229
30-Nov-1991	1: 6:0	24.86	4.43	39
30-Nov-1991	15: 2:44	27.39	5.27	96
1-Dec-1991	6:54:1	22.95	3.10	50
1-Dec-1991	13: 2:30	23.59	7.90	78
2-Dec-1991	0:20:21	21.37	3.47	52
2-Dec-1991	12:51:1	23.27	3.97	158
3-Dec-1991	8:11:52	20.73	2.97	70
3-Dec-1991	12:23:43	19.78	4.17	154
4-Dec-1991	6:28:4	17.56	1.93	260
4-Dec-1991	12: 4:13	18.51	18.93	32
5-Dec-1991	0:57:8	18.51	5.87	57
5-Dec-1991	13:16:27	15.66	29.87	17
6-Dec-1991	9:22:4	15.34	6.83	25
6-Dec-1991	12:59:5	16.29	22.23	21
7-Dec-1991	0:17:47	15.97	64.67	02
7-Dec-1991	12:33:36	16.92	7.93	27
8-Dec-1991	1:35:54	16.29	13.80	12
8-Dec-1991	12:21:38	15.34	14.70	42
9-Dec-1991	1:17:24	15.02	13.23	17
9-Dec-1991	12: 3:35	15.02	54.83	06
10-Dec-1991	6:52:25	15.34	121.03	03
10-Dec-1991	13: 9:58	15.66	17.43	32

Appendix 35. Continued.

DATE	TIME (GMT)	TEMP (C)	MEAN DIVE	NO. DIVE
11-Dec-1991	0:32:6	15.97	10.90	23
11-Dec-1991	12:53:31	15.02	21.60	16

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VITA

JOHN A. KEINATH

Born in New London, Connecticut, 6 October 1959. Graduated from Suffield High School in 1977. Earned B.S. in Zoology in 1981, B.A. in Chemistry in 1984, and M.S. in Zoology in 1986, all from the University of Rhode Island. Entered the doctoral program in the College of William and Mary, School of Marine Science in 1986.