

CENTRAL CALIFORNIA COASTAL CIRCULATION STUDY
DRIFTER OBSERVATIONS
FEBRUARY, JULY, OCTOBER 1984 AND JANUARY 1985

by

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ABSTRACT

Surface drifters were deployed and tracked over the continental shelf and upper continental slope off central California between Point Conception and Point Sur. The drifters were deployed and tracked from aircraft by Aero-Marine Surveys, Inc. under subcontract to Raytheon Service Company as part of the Central California Coastal Circulation Study sponsored by the Minerals Management Service. The objectives of this 18-month field program were to obtain a set of observations of the ocean water mass and velocity fields and develop a detailed description of these fields and their seasonal and shorter period variations. The ultimate goal is to assess the impact of exploitation of offshore oil and gas resources of the outer continental shelf region. This data report contains maps of drifter trajectories for a total of 78 drifters deployed and tracked during four separate months (February, July and October 1984, and January 1985). Also included are time series plots of winds during the times of deployment.

INTRODUCTION

The Central California Coastal Circulation Study (CCCCS) was an 18-month field program designed to study the variability of water mass characteristics and velocity field on the continental shelf and upper continental slope from Point Conception to San Francisco. This study was funded by the U.S. Department of Interior, Minerals Management Service (MMS) as part of an overall assessment of the impact of development of oil and gas resources on the ecosystem of the California Current System. The region from Point Conception to Point Buchon (100 km to the north), extending 50 km offshore, is of particular interest as this will be the focus of oil and gas exploration and production in the immediate future. However, MMS is also interested in how this region relates to the large scale flow of the California Current System.

Historically, repeated surveys of the California Current System have been conducted since 1949 by the California Cooperative Oceanic Fisheries Investigations (CalCOFI). The primary purpose of these surveys is to gain an understanding of the ecological factors controlling the fisheries in this region and develop a useful fisheries management strategy. The area sampled most intensely by CalCOFI ranges from San Francisco in the north to southern Baja California and extends offshore a distance of approximately 500 km. Hydrographic measurements have been made on a geographically fixed grid with 65 km spacing in both the alongshore and cross-shore directions (somewhat tighter cross-shore spacing nearshore).

The 35-year CalCOFI data set has been very useful for studies of the seasonal (Reid, Roden and Wyllie, 1958; Lynn, 1967; Hickey, 1979; Chelton, 1984) and interannual (Chelton, Bernal and McGowan, 1982) variability of water mass characteristics and the flow field in this region. However, the relatively coarse 65 km grid spacing has restricted these studies to rather large spatial scales of variability. Finer spatial resolution is necessary to study the fate of pollutants associated with oil and gas development on the outer continental shelf. The purpose of CCCCOS was to collect a set of measurements capable of resolving finer spatial scales and shorter temporal scales than can be studied from historical data. The relation between the CCCCOS survey region and CalCOFI sampling grid is shown in Fig. 1. The

CalCOFI Grid and CCCCS Sampling Region

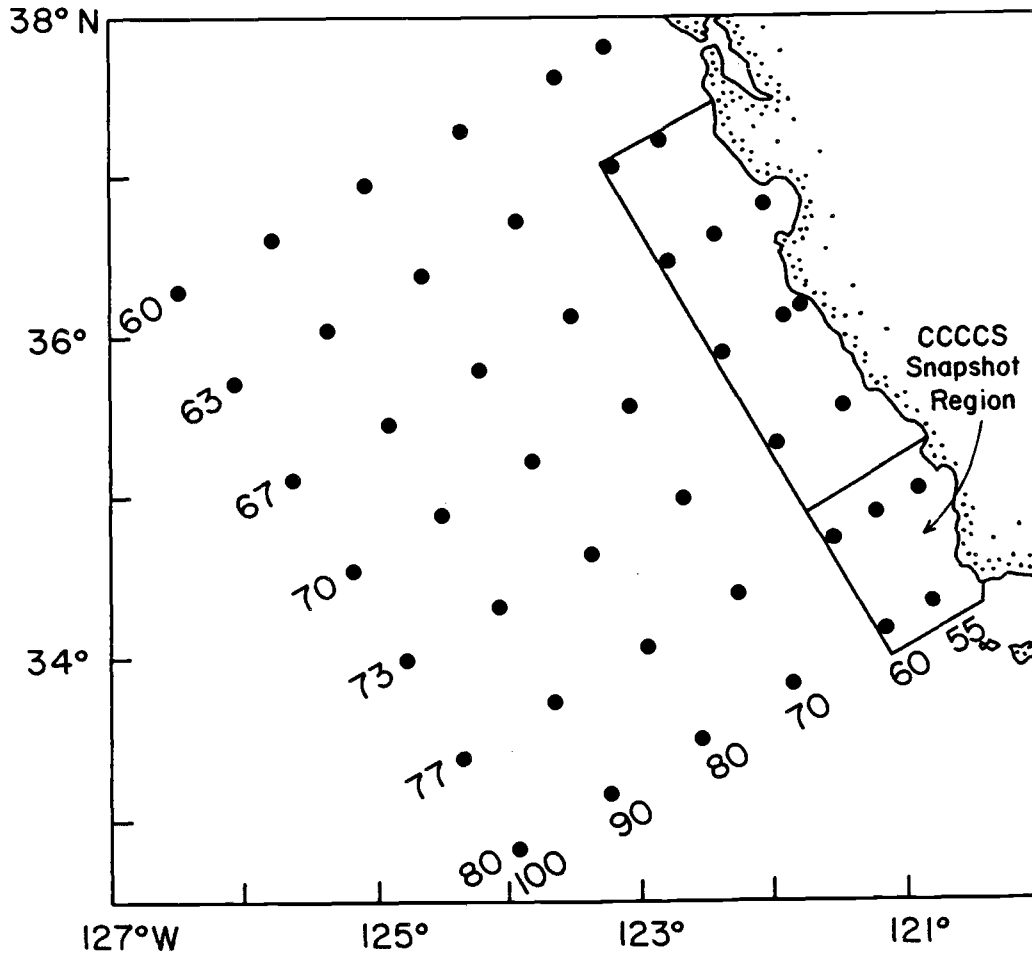


Fig. 1 The standard CalCOFI grid pattern off the central California coast. The numbers at the offshore locations refer to the CalCOFI line numbers. The numbers at the southern locations refer to CalCOFI station numbers along each line. The full CCCCS sample region and the CCCCS snapshot sample region are indicated by the boxed areas.

locations of the CCCCS CTD stations, current meters and NDBC wind buoys are shown in Fig. 2. The CCCCS CTD sampling grid was more dense in the southern portion of the CCCCS sampling region. The water mass characteristics in this "snapshot region" were sampled twice over an eight day period during most of the CCCCS CTD surveys to investigate how rapidly the water mass and flow field characteristics change in this region.

The field work for CCCCS was conducted from February 1984 through July 1985 by Raytheon Service Company. Measurements collected during this 18-month field study can be categorized as:

- (a) Measurements and data collected over the entire 18-month period. Measurements of this type included:
 - (1) Moored current meter data and bottom pressure gauge measurements (30 minute interval).
 - (2) Meteorological data (hourly interval).
 - (3) Sea-level (tide gauge) observations (hourly interval).
 - (4) Infrared satellite imagery (including all sufficiently clear images).
- (b) Measurements and observations related to the episodic sampling of summer, fall and winter seasons (with two winter samplings). Measurements of this type included:
 - (1) Hydrographic measurements (20 km CTD spacing with XBTs in between).
 - (2) Lagrangian surface current drifter studies.

The continuous measurements extended from February 1984 through July 1985. The episodic operations took place in February, July and October 1984 and January 1985. A preliminary analysis of the entire CCCCS data set is presented in Chelton, Bernstein, Bratkovich and Kosro (1987). This data report deals only with the surface drifters deployed in the snapshot region during all four of the episodic operations.

Coincident with each of the four CCCCS CTD surveys, approximately 20 surface drifters were deployed from aircraft in the snapshot region. The drifters used in these surveys consisted of a 132-cm tube that floats vertically like a spar buoy, with a cylinder 6 cm in diameter protruding about 20 cm above the water line. The drifters are coupled to the surface water motion by four orthogonal arms that radiate outward 60 cm from the tube, attached 15 cm below the water line. A more detailed description of the drifters is given in the following section. Field test comparisons with dye

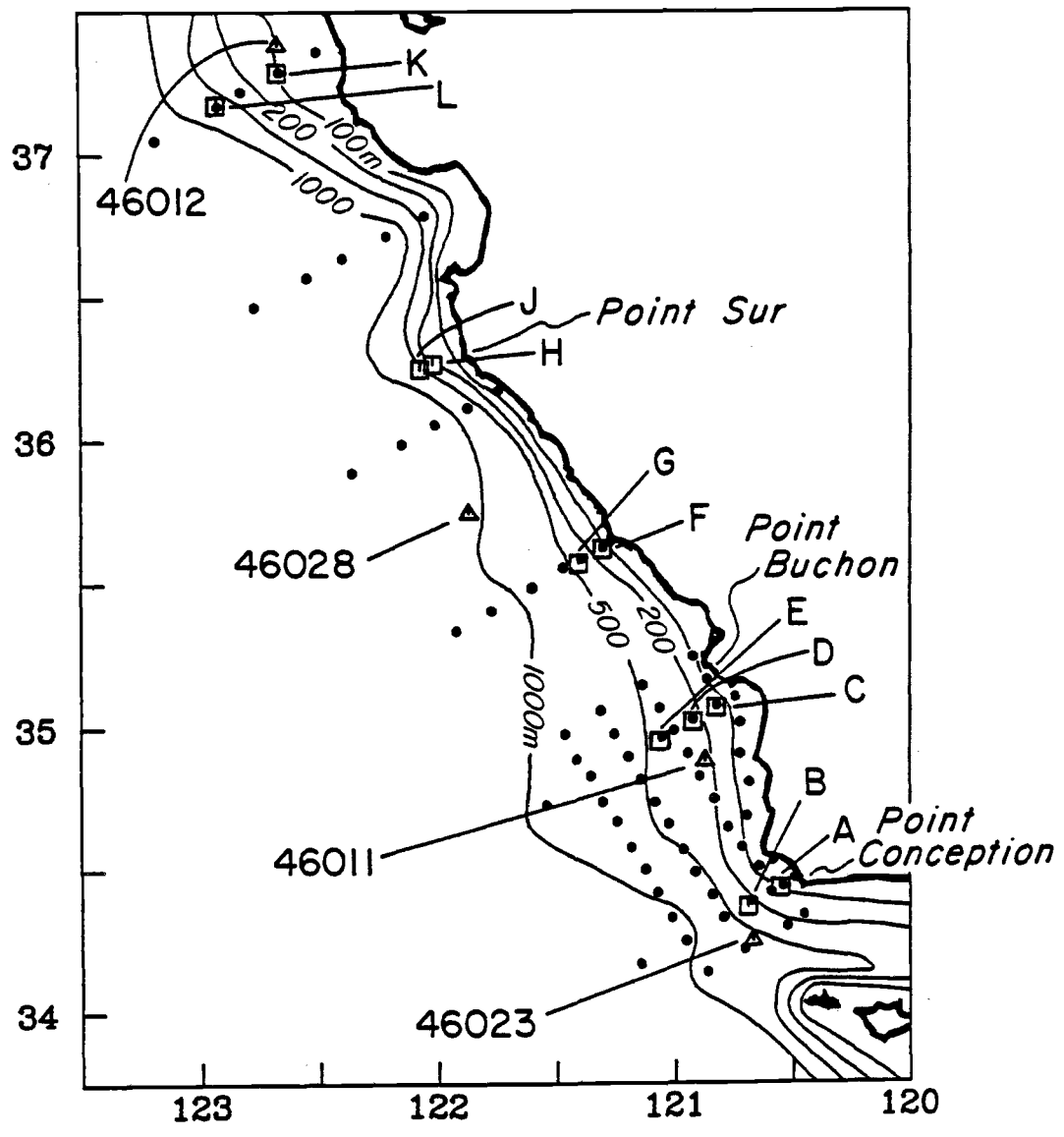


Fig. 2 Map of the CCCCS study region overlaid on depth contours in meters. The dots indicate the locations of CCCCS CTD stations. Current meter moorings are shown by squares and NDBC wind buoys are shown by triangles. Current meter moorings and NDBC buoys are identified by letters and numbers, respectively.

patches showed downwind motion of the drifters at an average of 0.5% of the wind speed. Consequently, windage of the drifters is believed to not be a serious problem.

An attempt was made to coordinate the drifter release locations with flow patterns inferred from infrared satellite imagery. Each drifter was equipped with a radio beacon which allowed an aircraft to home on the device from a distance of 50 km or more. The drifters were tracked by aircraft over a period of about 15 days using a radio direction finder and Loran-C aircraft position determination. Daytime location of the drifters was aided visually by dye released continuously from the drifter (see next section).

In the first drifter survey (February 1984), drifters were released in two clusters separated by 5 days. There were 10 drifters deployed in the first cluster and 9 in the second. In subsequent drifter surveys (July and October 1984, and January 1985), drifters were released in three clusters of 8, separated in time by 4-6 days. In the early period after each cluster deployment, drifter locations were determined three times daily from two daylight flights and one night-time flight. During some of the surveys it was necessary to eliminate some of the tracking flights due to heavy fog conditions. There was one occasion during the July 1984 survey that a mechanical failure in the aircraft engine curtailed flights for a 24 hour period. Toward the end of the tracking exercise for each cluster, the drifters had dispersed over a large area and it was necessary to reduce the number of tracking flights to two per day in order to locate all of the drifters.

One of the objectives of the drifter studies was to evaluate surface transport characteristics between prime areas of resource development and environmentally sensitive areas of the California coastal region. Another objective was to relate the drifter-inferred surface flow to environmental conditions prior to or during the drifter surveys. Large-scale oceanographic and meteorological conditions in the California current during the times of the four drifter surveys are summarized in four CCCCS CTD data reports (Chelton and Kosro, 1987a; 1987b; 1987c; 1987d). Surface geostrophic flow conditions inferred from the CCCCS CTD data from the full and snapshot regions are included in the figures presented later in this report. In addition, satellite infrared images of the California Current and maps and time series of the wind field at the times of the drifter surveys are included in the report.

As a brief overview of surface flow characteristics inferred from the drifter surveys, the July 1984 drifter trajectories were variable but generally poleward in the snapshot region, with very rapid poleward flow (speeds exceeding 35 cm/s) north of 35°N. There is a suggestion of offshore turning of the drifters at Point Sur, where an offshore jet of cold water is evident in the satellite imagery. Note that the rapid poleward velocity of the drifters is against the winds which were equatorward throughout the July 1984 drifter survey period. All of these features are consistent with both the current meter measurements and surface dynamic topography.

The October 1984 drifter trajectories were also consistent with CTD data; all of the drifters moved steadily southward with typical speeds of 20-30 cm/s.

In contrast, the drifter trajectories for the two winter surveys are difficult to rationalize in terms of the flow patterns inferred from other data. For example, most of the February 1984 drifters moved in a generally southward or southwestward direction. Yet the geostrophic flow was consistently poleward in the drifter survey region. Similarly, the January 1985 geostrophic flow was quite strong poleward in the drifter region, but the drifter trajectories are more indicative of variable flow.

The rather surprising discrepancies between the drifter and hydrographic data during the two winter surveys are presently under investigation. As noted previously, field test comparisons with dye patches showed downwind motion of the drifters at an average of 0.5% of the wind speed. For the winds observed during the CCCCS drifter surveys the corresponding wind drift velocities (less than 5 cm/s) are much smaller than the observed drifter velocities of 15-30 cm/s. Consequently, windage of the drifters is believed to be no problem. A more likely explanation for the discrepancies between drifter and hydrographic data is a poor representation by the hydrographic data of near-surface currents.

Overall, from the four drifter surveys, the flow appears to be considerably more complex in the snapshot region than in regions both north of 35.2°N and south of 34.4°N. In all but the October 1984 survey, drifters tended to wander in the snapshot region but move steadily and rapidly either southward or northward outside of the snapshot region. This apparent difference may be due in part to the more frequent drifter location fixes shortly after a cluster deployment when the group of drifters was more tightly

clustered. However, a fundamentally different character of the circulation in this region might be expected due to the influence of flow in and out of the Santa Barbara Channel (Brink and Muench, 1986), as well as by ocean conditions to the north and south. The wider continental shelf in this region (see Fig. 2) may also be a contributing factor.

DRIFTER DESIGN

The drifters used in the CCCCS surveys were designed previously by Raytheon Ocean Systems Company for application to study of the New England outer continental shelf. A complete description of these drifters is given in Cook, Richardson, Flynn and Berger (1980). The following summary has been extracted directly from this reference.

The design of the drifter is shown in Fig. 3. The assembled unit looks like an elongate vertical cylinder with four equally spaced radial arms just below the water surface. Major structural elements include an outer tube, an inner tube, flotation devices, and the arms.

The tubes are made of low density polyethylene. The inner tube, which extends the full 132-cm length of the drifter, is capped and ballasted with lead. The lower portion is packed with a waxlike mixture of hydacid uranine concentrate (fluorescein dye), polyethylene glycol, and oleic acid. This section of the inner tube has eight vertical slits which expose the dye mixture. The inner tube is separated from the outer tube by four thin vertical strips of styrofoam. The shorter outer tube rests at its upper end against a wooden dowel driven through the inner tube. An end cap at the bottom of the outer tube has a one-way rubber check valve which admits water into the drifter. A polyethylene collar just above the dowel has four high density polyurethane arms attached to it radiating horizontally outward from the collar where they overlap at right angles to each other. Seated just between the arms and upper collar is a ring of styrofoam surrounding the inner tube. A styrofoam cylinder of similar length is housed within the inner tube and held in place by dowels. The 8 kg (in air) drifter floats vertically like a spar buoy with the waterline a few centimeters below the top of the flotation ring. Thus, about 20 cm of the unit is above the water surface and 112 cm below. The arms attach 15 cm below the surface.

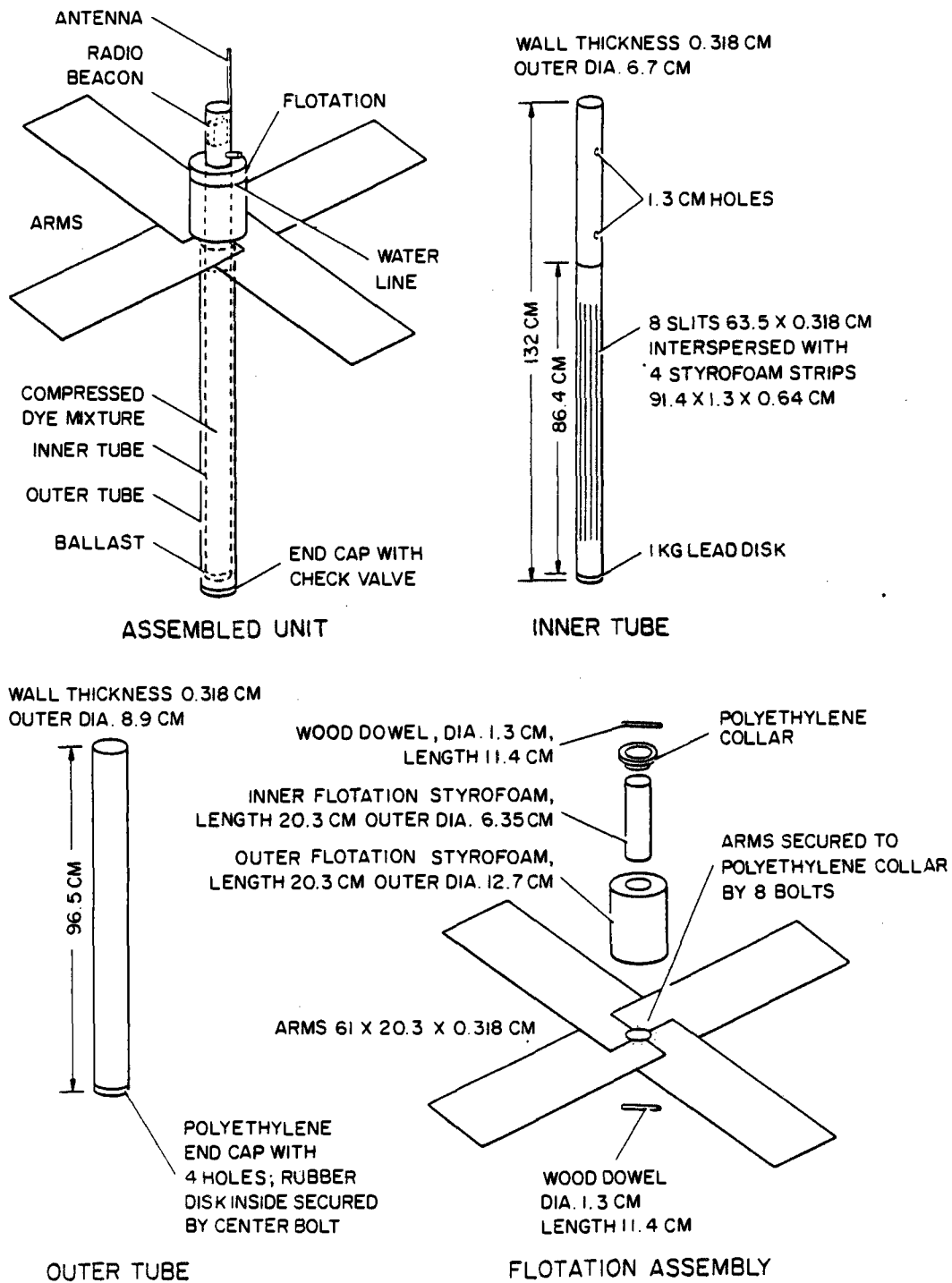


Fig. 3 Configuration and components of the Raytheon Service Company surface drifter used in the CCCCS surveys.

Vertical currents resulting from passing waves cause water to enter the interior of the drifter through the end valve. As this water moves upward between the inner and outer tubes, it entrains dissolving dye through the inner tube slits. The water and entrained dye are discharged at the top of the outer tube just below the water surface. Diffusion of the negatively buoyant fluorescein dye creates a bright green patch which can be seen from an aircraft. The vertical shear of wind-induced currents causes the downward-diffusing dye to lag behind the drifter, creating a streak pointed upwind. Downwind slippage of the drifter is a minor contributor to this streak.

The rate of dye dissolution increases with both higher water temperatures and a lower concentration of oleic acid. Proportions of dye, polyethelene glycol, and oleic acid of 6:13:1 have been found to be well suited to water temperatures of 5°-20°C. This mixture releases dye strongly for 3 days and at a diminishing rate for several more.

The four arms radiating from the drifter increase the underwater area and thus the coupling with surface water. When color-coded, they provide the unit with a unique indentification. The 10x60 cm arms are visible from altitudes up to 1,000 m. The overlapping arms also serve as a roto-chute when the drifter is deployed from an aircraft, orienting it vertically and slowing its descent. Terminal fall velocities of the drifter range from 14 to 18 m s⁻¹ and impact damage is usually negligible.

The primary aid in relocation is a VHF radio beacon. These beacons are aircraft emergency locator transmitters, made to survive high shock loads; the output is modified to radiate at permitted frequencies for experimental purposes. The small, 0.23-kg beacon package fits into the open inner tube at the top of the drifter, and a 30 cm long antenna extends into the air. These beacons are available with six nonemergency frequencies in the 121.6-121.8 MHz range (Glatzer Industries, White Plains, N.Y.). Each frequency has one of six different audio codes, which gives 36 individual beacon identities.

Radio beacons are activated by connecting redundant transmitter and antenna leads just before a drifter is released. In past studies, about 98% of the drifters and 95% of the beacons have survived air deployment. Alkaline batteries yield 3-10 days of operation depending on type. The beacons produce a continuous signal which can be homed on by aircraft with direction-finding

equipment having a left-right direction indicator and an audio output. More sophisticated direction finders give a range and a bearing to the beacon. The distance from which a beacon can be sensed varies with aircraft altitude and signal strength. For the first 50% of battery life, the beacon transmissions can be sensed with the simpler direction finders from about 25 km at an altitude of 200 m and from 100 km at 3,000 m.

Field test studies have been conducted to measure wind-induced drifter displacement relative to zero leeway markers, which are 30-cm-long dye-emitting devices having negligible exposure above the surface. Relative to these markers, the drifters showed downwind motion at an average of 0.5% of the wind speed in five 30-min trials. The drifters move downwind faster than dye dispersed in the upper 2 m of the water column but more slowly than floating aluminum powder. These observations along with the leeway data suggest that the drifters track motion of water within 1 m of the surface with reasonable accuracy in the absence of strong winds.

DATA PROCESSING

The drifters were deployed and tracked from aircraft by Tim Flynn of Aero Marine Surveys, Inc. The total numbers of drifters deployed during the February, July and October 1984, and January 1985 surveys were 19, 21, 23 and 24, respectively. The drifters were located using a radio direction finder and Loran-C aircraft position determination. Loran-C coordinates were converted to latitude and longitude by Aero Marine Surveys, Inc. A list of location fixes for each drifter deployed in a survey was sent to Raytheon Service Company and forwarded on magnetic tape to Oregon State University (OSU).

At OSU, the drifter locations were scanned to search for any obvious data entry errors and determine the period of time each drifter was tracked and the latitude and longitude range spanned by the drifter trajectory. Several drifters "disappeared" after a very short time and a few, for unexplained reasons, remained at nearly fixed locations for a period of several days and then stopped transmitting. These drifters were excluded from subsequent analysis (and are not shown in this data report) since the corresponding trajectories were not useful scientifically. The total numbers of useful drifters were 19, 18, 22 and 19 for the four surveys.

After deployment, the drifters were located three times daily (two daytime flights and one nighttime flight). This tracking pattern continued until the cluster of drifters became so widely dispersed that it was impossible to carry out three tracking exercises per day and locate all of the drifters. The drifters were then located twice daily until the end of the 15-day drifter survey.

From the drifter trajectories presented later in this report, it is apparent that the nature of the drifter movements was rather different during each of the four surveys. For example, most of the drifters deployed during February 1984 meandered somewhat but generally moved in a southwestward or southward direction at moderate speeds. During July 1984, most of the drifters moved rapidly poleward. Nearly all of the October 1984 drifters moved rapidly equatorward with some meandering. In January 1985, there was no single pattern to the drifter movements; some moved northward, some moved southward, and some moved in wide, sweeping circles.

The statistical nature of the drifter trajectories can be summarized by the time-lagged autocorrelation functions of latitudinal and longitudinal motion (Fig. 4). The shapes of the autocorrelation functions were quite similar for both longitudinal and latitudinal motions, and for all four drifter surveys. The decorrelation time scales ranged from 2.5 to 3 days for the February and October 1984 and January 1985 surveys. The decorrelation time scales were about 30% longer (about 3.5 days) for the July 1984 survey, indicative of the rapid and steady poleward movement of most of the drifters.

From the patterns of drifter trajectories, it is apparent that there is an underlying low frequency signal in the drifter movements. That is, over the periods surveyed, there were definite net movements of the drifters. The relatively short decorrelation time scales indicate that there is some high frequency "noise" in the drifter motions. Some of this high frequency "noise" may be due to errors in the drifter location fixes; much is probably due to inertial variability (about 1 cpd in the survey region) and tidal variations. This high frequency variability in the drifter trajectories is, at best, barely resolved in the 1 to 3-location fixes per day and thus introduces aliasing in the drifter tracks. This high frequency variability is of considerable interest to some oceanographic studies. However, for the goals of CCCCS, the

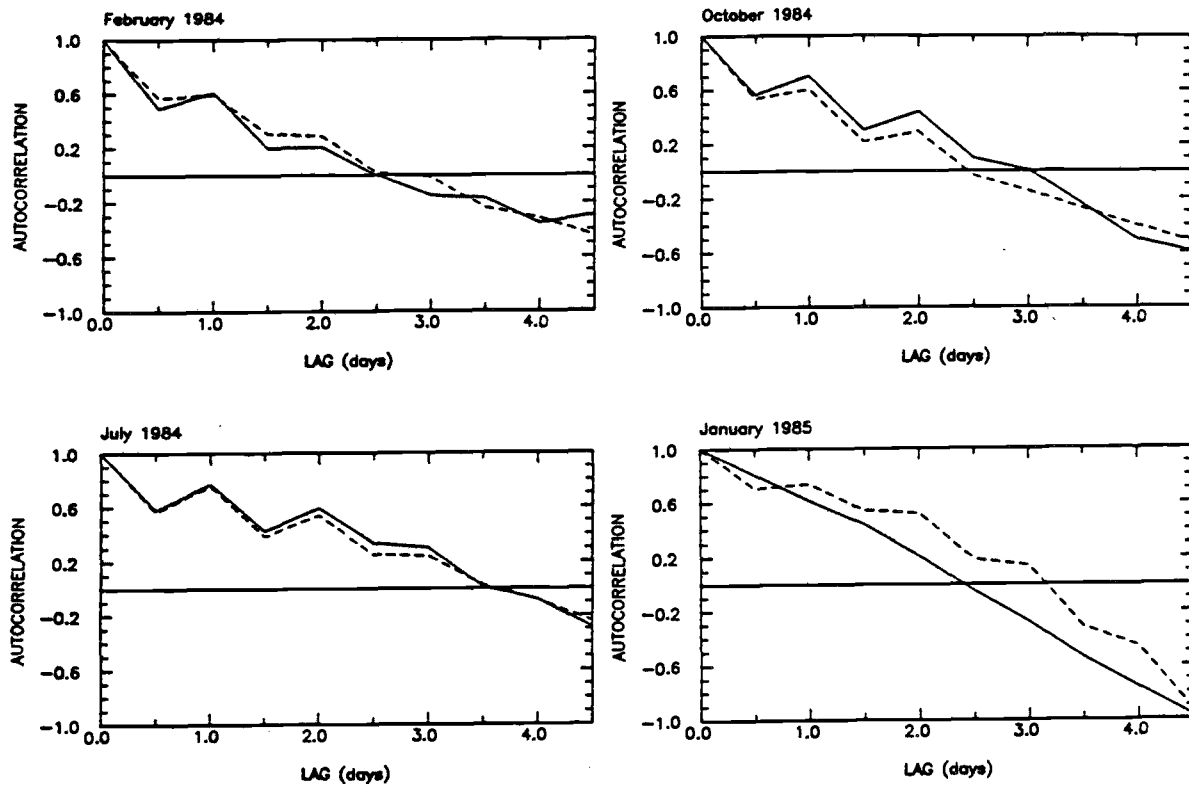


Fig. 4 Time-lagged autocorrelation functions for drifter latitudinal location (continuous lines) and longitudinal location (dashed lines) for each of the four drifter surveys.

lower frequency variability (time scales greater than a few days to a week) is of primary interest.

These longer time scales of drifter motion were very effectively extracted by objective analysis minimum mean square error interpolation (Gandin, 1965; Bretherton, Davis and Fandry, 1976) using a smoothed autocorrelation function (a Gaussian function with a half-power point at about 2 weeks). The smoothed drifter locations were estimated at time intervals of 0.05 days beginning with the time of drifter deployment and ending with the last observed drifter location time. Representative examples of raw drifter trajectories and smoothed interpolated drifter trajectories are shown in Figs. 5, 6, 7 and 8 for each of the four survey periods. The effectiveness of the interpolation technique for extracting the underlying low frequency motion is apparent. Note that the observed drifter locations do not, in general, fall exactly on the smoothed trajectories. This is because the unresolved high frequency drifter motion was treated as noise in the objective analysis. This noise was assumed to have a random root mean square error of 0.1 km.

Finally, it is useful to note that the smoothed objective interpolation of drifter locations has another distinct advantage. As noted previously, the drifters were typically located three times per day for a period of several days after each cluster deployment. It then became necessary to reduce aircraft flights to two per day because the drifters had become so widely dispersed that it was impossible to locate all drifters three times per day. The smoothed interpolation of drifter locations eliminates the sampling bias introduced by more frequent drifter location fixes at the beginning than at the end of a tracking exercise. Without smoothing, the drifter trajectories give the misleading impression that drifter motion is more chaotic shortly after deployment than later in the tracking exercise.

DATA PRESENTATION

The figures in this data report are grouped into four sections corresponding to the four drifter survey months (February, July, and October 1984, and January 1985). Each section contains a set of figures intended to summarize oceanographic and meteorological conditions at the time of the particular drifter survey and maps of the drifter trajectories. Included are maps of sea surface dynamic topography relative to 500 m, a satellite infrared

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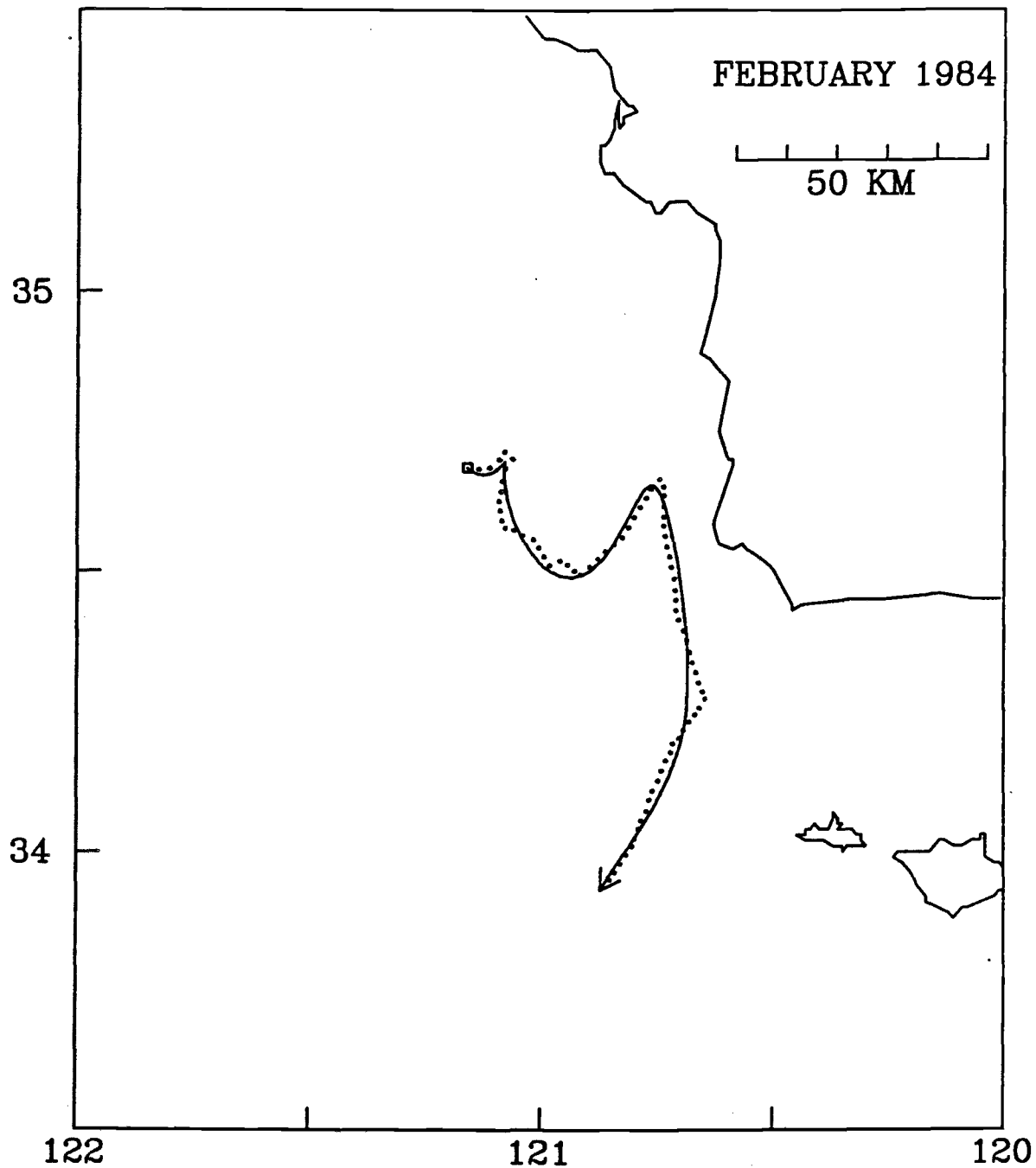


Fig. 5 A representative February 1984 drifter track constructed by connecting successive observation locations with straight line segments (dotted lines) and by objective analysis using minimum mean square error interpolation at intervals of 0.05 days between the times of first and last observations (continuous lines).

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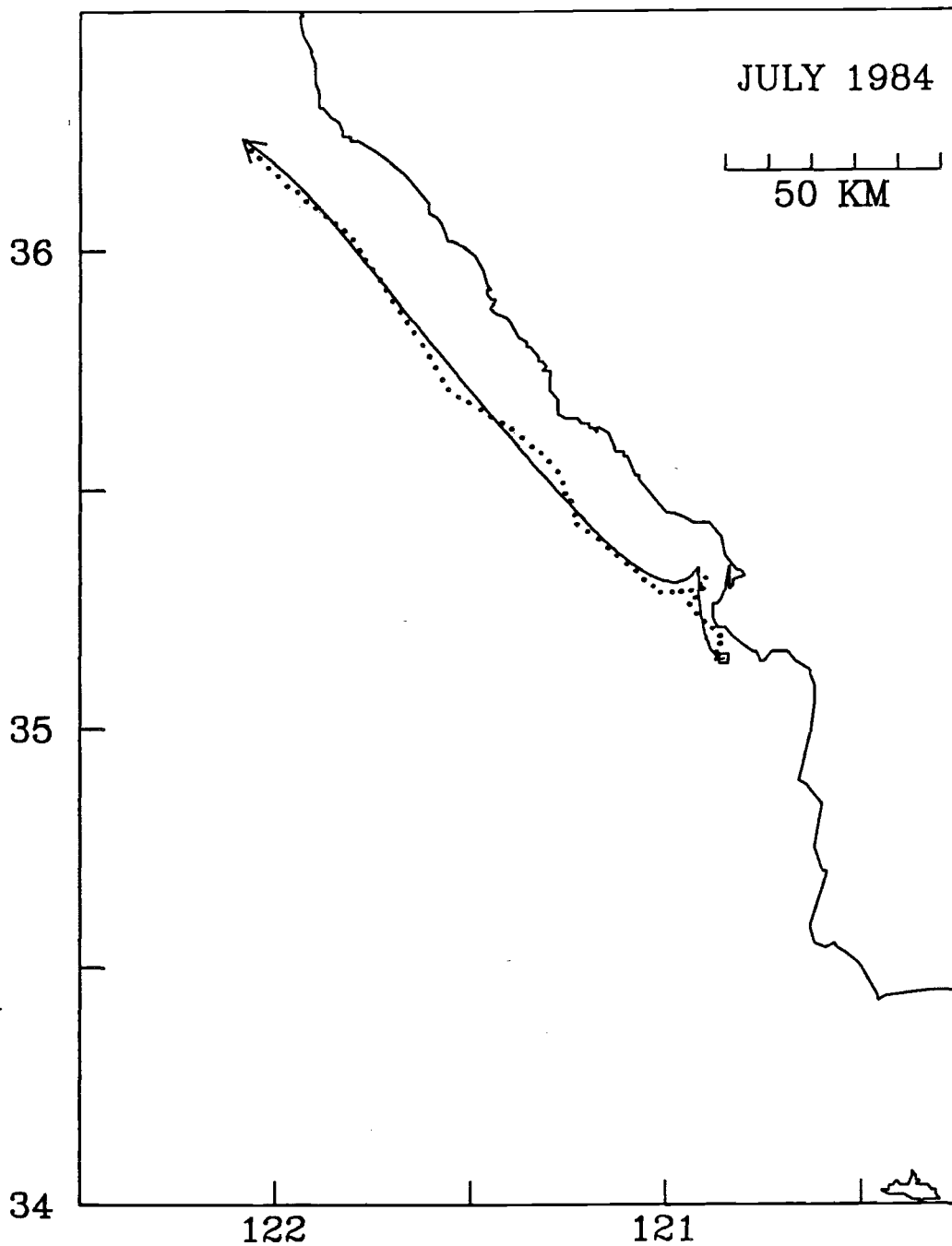


Fig. 6 As in Fig. 5, except a representative July 1984 drifter track.

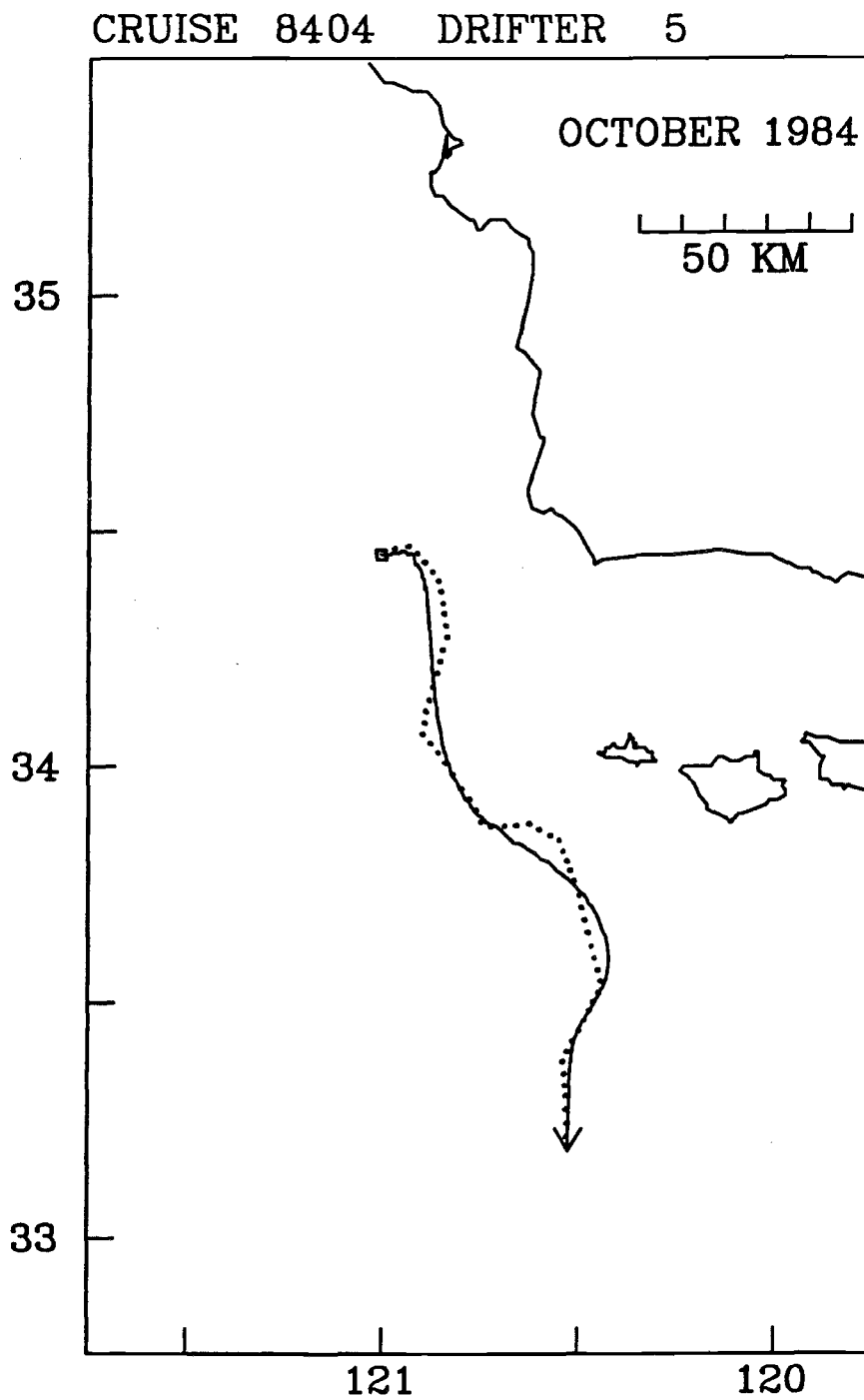


Fig. 7 As in Fig. 5, except a representative October 1984 drifter track.

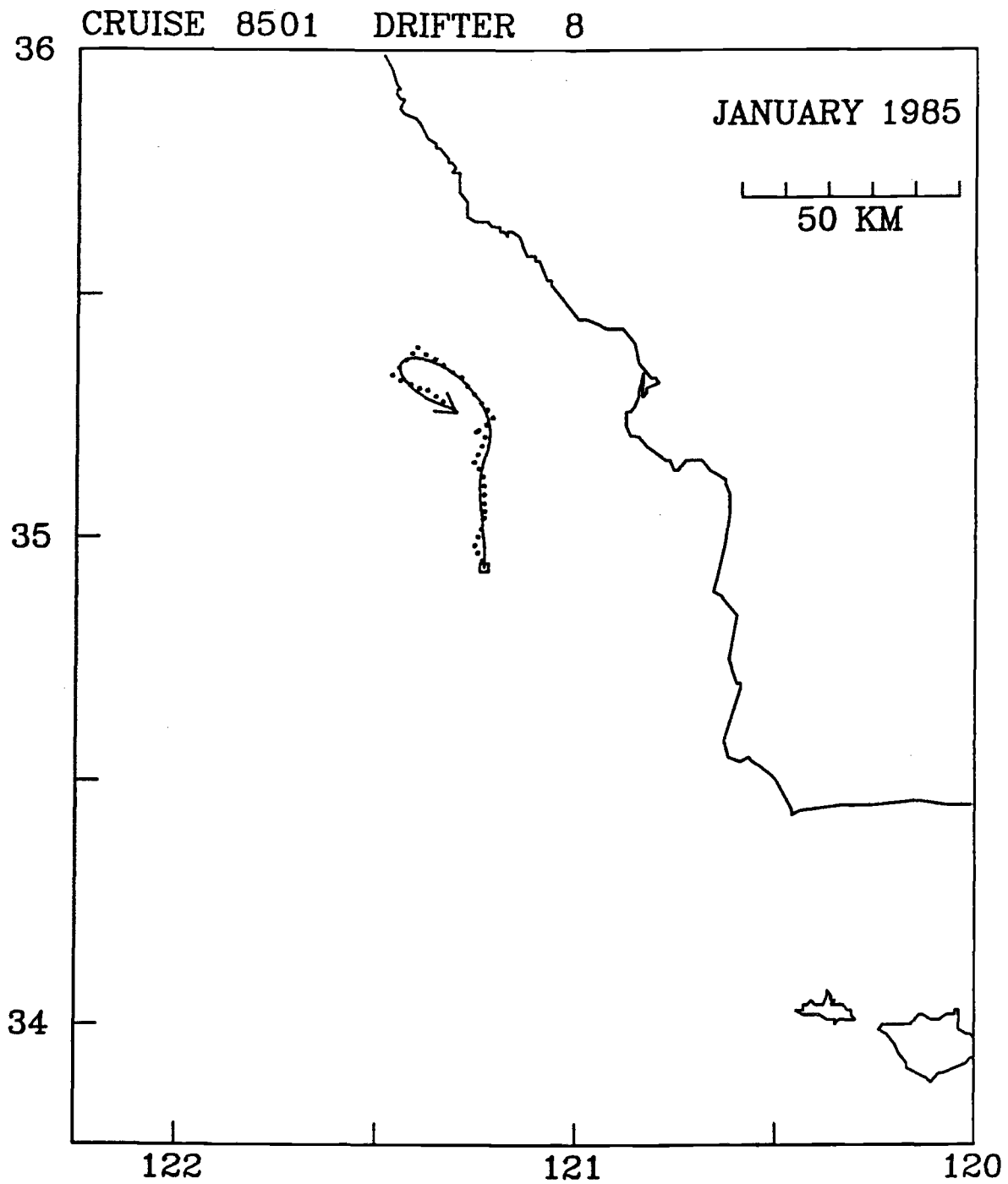


Fig. 8 As in Fig. 5, except a representative January 1985 drifter track.

image of the survey area, maps and time series of winds measured during the drifter survey, maps of drifter trajectories grouped by deployment time, and maps of individual drifter trajectories. The latitude and longitude bounds of the drifter trajectory maps were selected to optimize the presentation of drifter tracks for each survey. All of the maps bounds for a particular survey are the same, but the bounds differ for each individual survey (see Fig. 9). We give here a few brief comments on each of the data products contained in this report:

1. Surface dynamic topography relative to 500 m from the full region CCCCS CTD data. Arrows indicate the direction of geostrophic flow and a key is shown for estimating geostrophic velocity from the dynamic height contours.
2. Surface dynamic topography relative to 500 m from the snapshot region CCCCS CTD data. Arrows indicate the direction of geostrophic flow and a key is shown for estimating geostrophic velocity from the dynamic height contours.
3. Satellite infrared image of the California Current off central California during the time of drifter deployments. Data are from the operational NOAA satellite.
4. Wind observations from a hand-held anemometer on board ship during CCCCS CTD stations. Dashed lines define day boundaries during the CTD survey. For the first three drifter surveys, there are two maps of winds (corresponding to the two CTD snapshots). In January 1985 there was only one CTD snapshot so there is only one wind map.
5. Table of drifters released during the survey. Table entries include the total number of location fixes for each drifter, the drifter release point (decimal latitude and longitude), the release time in decimal Julian days (the calendar date is also shown), and the last observation time in decimal Julian days (the calendar date is also shown). Drifters without numbers in column 1 were deemed to not be useful scientifically (see previous section). Times are local Pacific Standard Time (PST) for February 1984 and January 1985 and Pacific Daylight Time for July and October 1984.

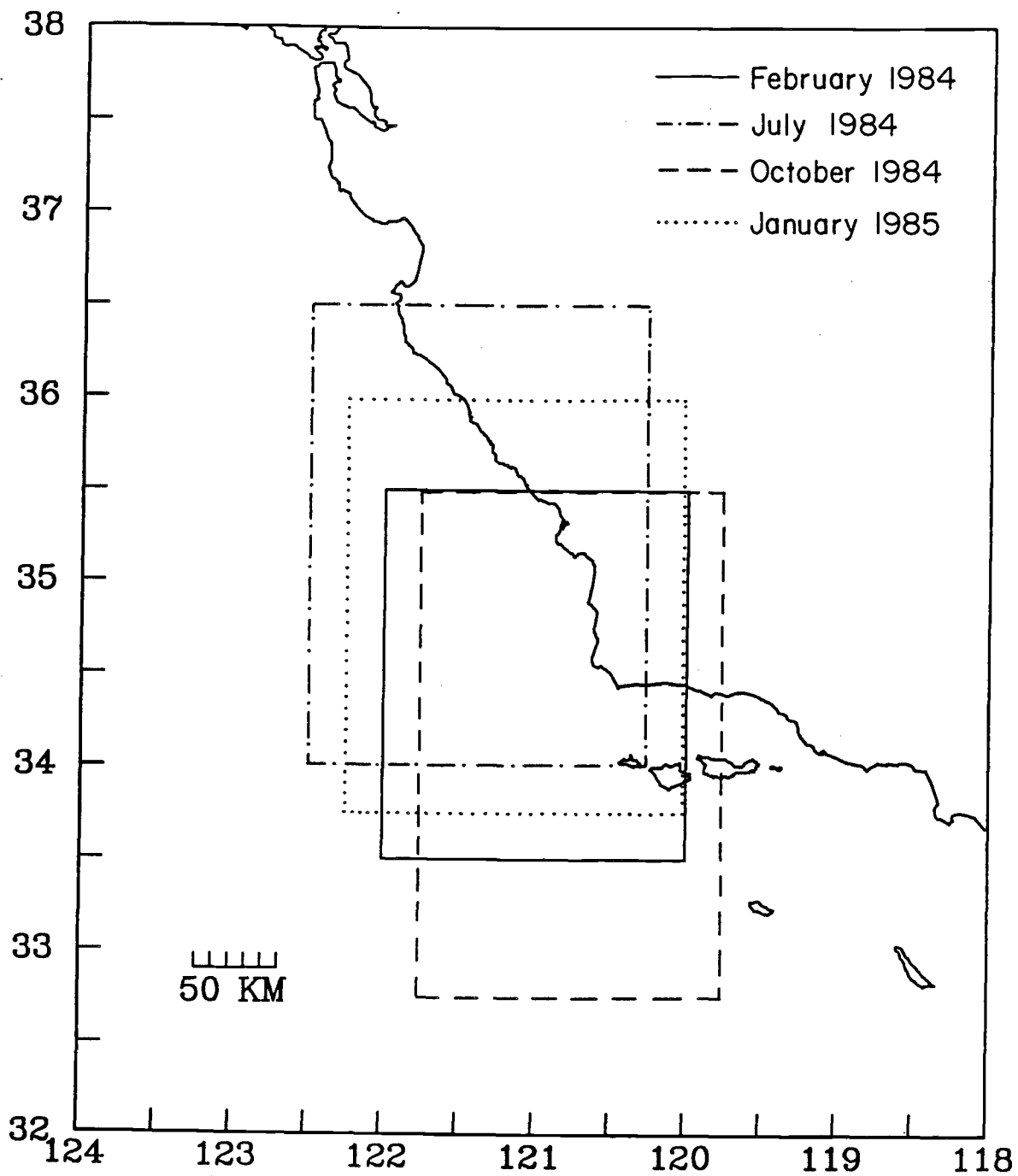


Fig. 9 Large-area map of the California Current off the central California coast. The four rectangles show the bounds selected for presentation of the drifter trajectories later in this data report. These subregions were defined to optimize presentations for each of the four individual drifter surveys.

6. Drifter deployment locations. One map is presented for each cluster deployment (2 deployments in February 1984 and 3 deployments each in July and October 1984 and January 1985). The cluster shown corresponds to all of the drifters released on the day indicated. Numbers correspond to the drifter numbering convention adopted here for presentation of individual drifter trajectories. The lower left corner of the number defines the release location.
7. Trajectories of all drifters released during the survey indicated. The boxes indicate the drifter release points and the tips of the arrowheads correspond to the last observed drifter locations. The drifter trajectories were determined by smoothed objective interpolation as described in the previous section.
8. Trajectories of all drifters in the cluster released on the day indicated. The boxes indicate the drifter release points and the tips of the arrowheads correspond to the last observed drifter locations. The drifter trajectories were determined by smoothed objective interpolation as described in the previous section.
9. Trajectories for each individual drifter deployed during the survey indicated. One plot is presented for each drifter (a total of 19, 18, 22 and 19, respectively, for the February, July and October 1984, and January 1985 surveys). A table of the raw drifter locations is presented in the upper left portion of each plot. This table includes the drifter observation location times (in decimal Julian days), the observation location (decimal latitude in °W and longitude in °N) and the average drifter speed (in km/day) since the previous observed location. The speed in units of m/s is approximately 10% smaller than the speed in units of km/day. Times are local Pacific Standard Time (PST) for February 1984 and January 1985 and Pacific Daylight Time (PDT) for July and October 1984.

A map of the smoothed drifter trajectory estimated by smoothed objective interpolation at intervals of 0.05 days, as discussed in the previous section, is presented in the upper right portion of each plot. In each map, the box indicates the drifter release point and the tip of the arrowhead corresponds to the last observed drifter location. The dots along each trajectory correspond to local noon of each day (and are not the observation locations). Thus, the dots are separated by time

intervals of 1-day. This provides a quick qualitative feeling for the drifter velocity. A more quantitative estimate can be obtained from the last column of the table in the upper left portion of each plot.

Finally, a time series of winds is presented at the bottom of each plot. Except for the February 1984 drifter survey, these winds were measured at NDBC buoy 46011 (in the middle of the snapshot region - see Fig. 2). During January and February 1984, NDBC buoy 46011 was inoperative. The wind time series in the February 1984 plots correspond to winds measured at NDBC buoy 46028 (Fig. 2), about 150 km north of buoy 46011. It is shown in Chelton, Bernstein, Bratkovich and Kosro (1987) that the coherence length scales of the wind field along the central California coast are large. Thus, buoy 46028 is also representative of winds in the snapshot region. Both the alongshore (defined to be 325°T) and cross-shore (55°T) components of wind in m/s are shown in the plot. Positive wind speeds correspond to poleward and onshore winds. The time series plot is the same for each individual drifter of the particular survey and ranges from about two weeks prior to the time of the first drifter deployment to about two days after the time of the last observed drifter location. Tic marks along the bottom axis correspond to hour 0000 of each day. Julian days and days of the month are labeled along the bottom axis. The vertical bars in the wind time series plots correspond to the first and last observation times of the particular drifter plotted in the upper right portion of each plot.

ACKNOWLEDGEMENTS

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CRUISE 8401, FEBRUARY 1984

DYNAMIC HEIGHT (DYN CM)

0/500 M

FEBRUARY 1984

37

36

35

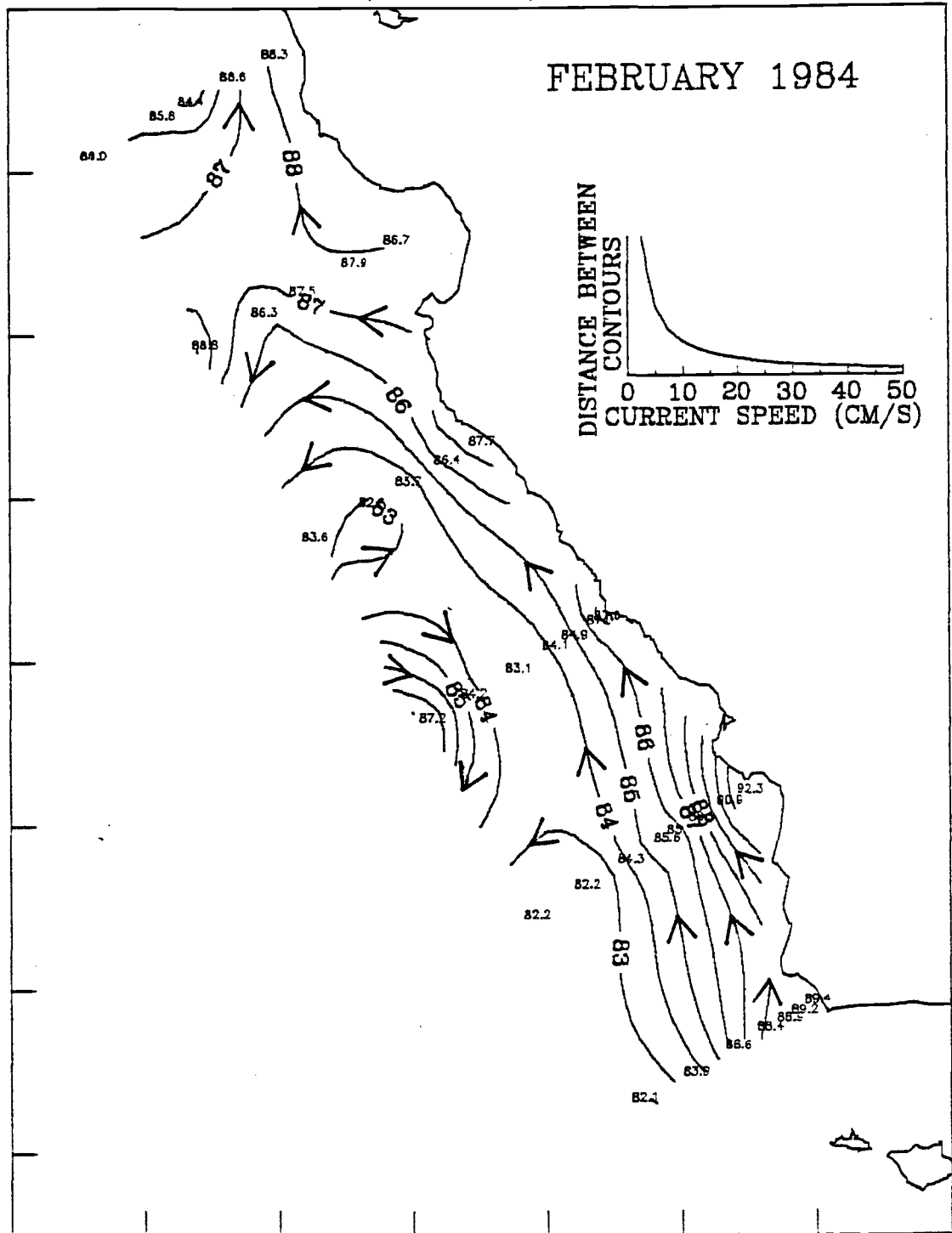
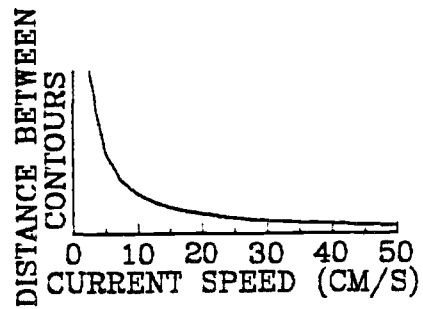
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123

122

121

120



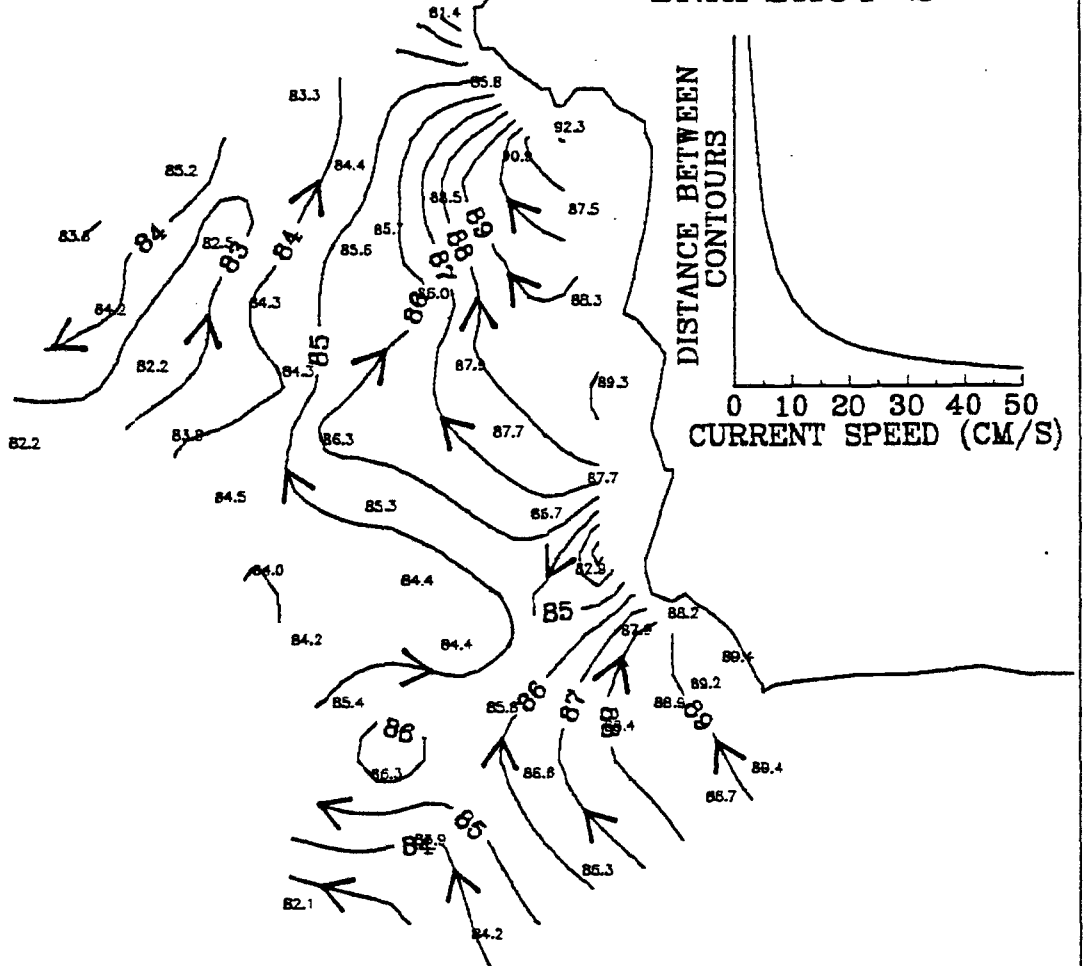
DYNAMIC HEIGHT (DYN CM)

0/500 M

FEBRUARY 1984

SNAPSHOT 2

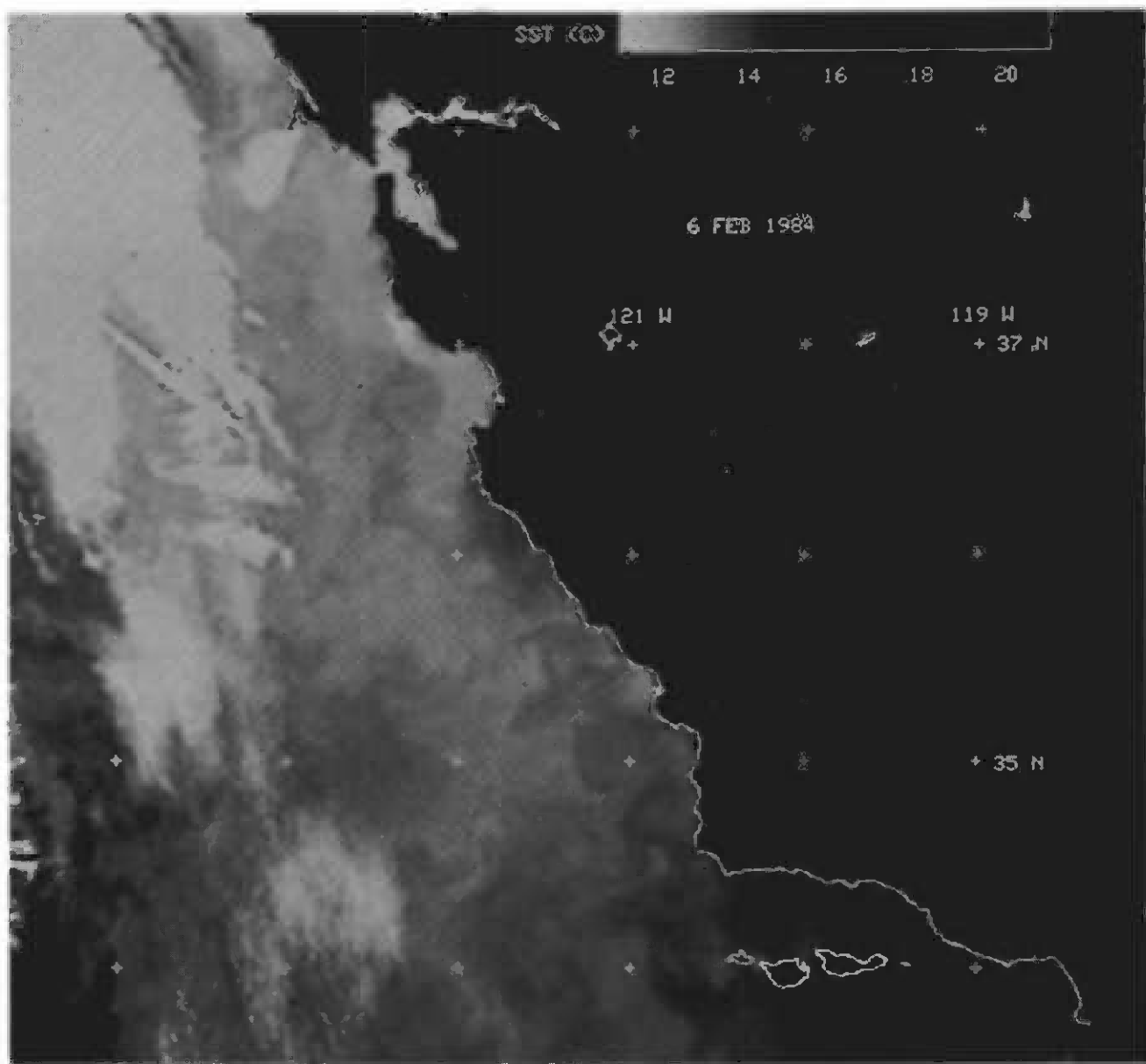
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34

121

120



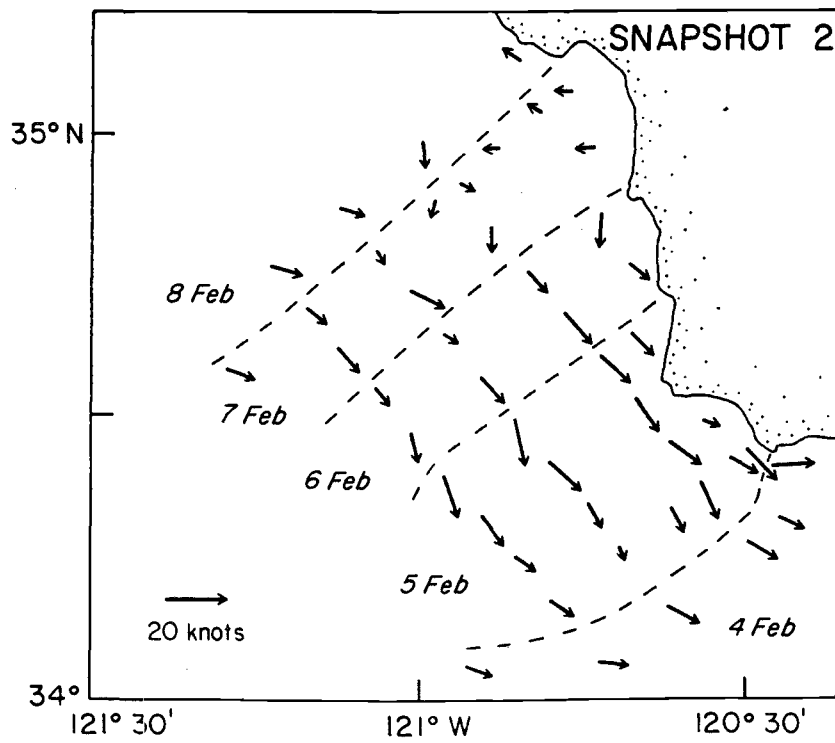
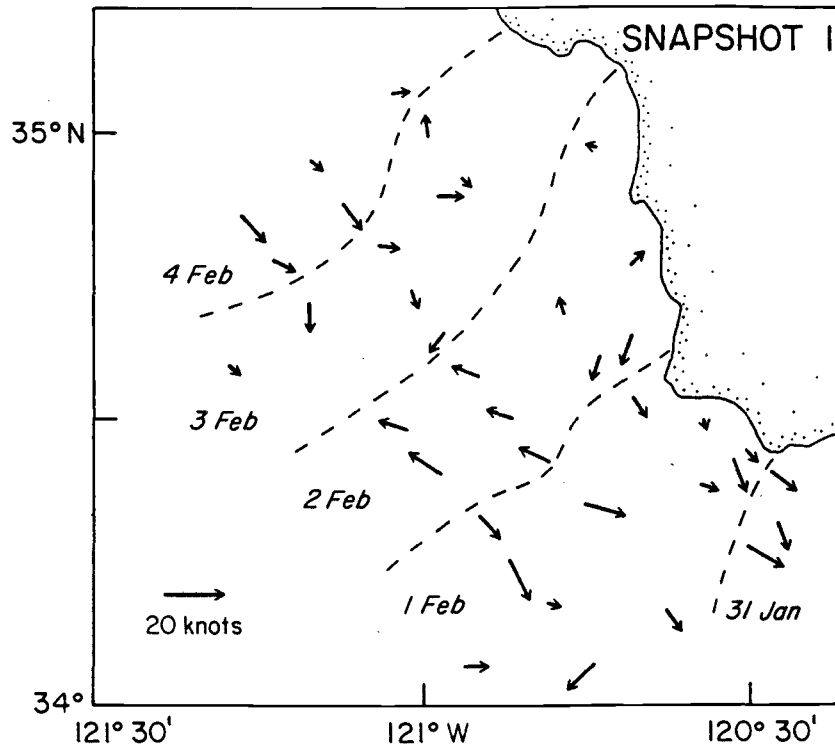
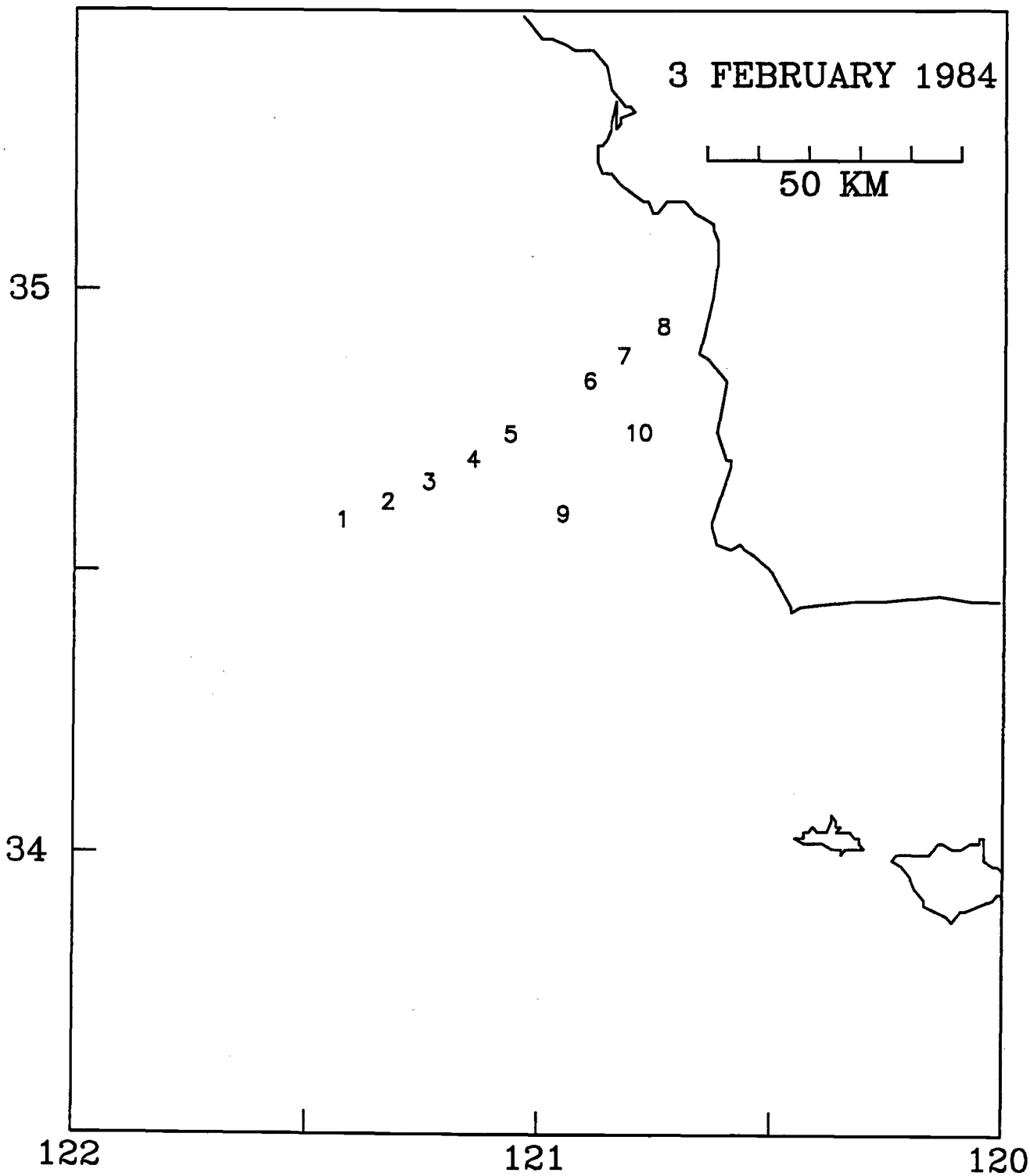


Table 1

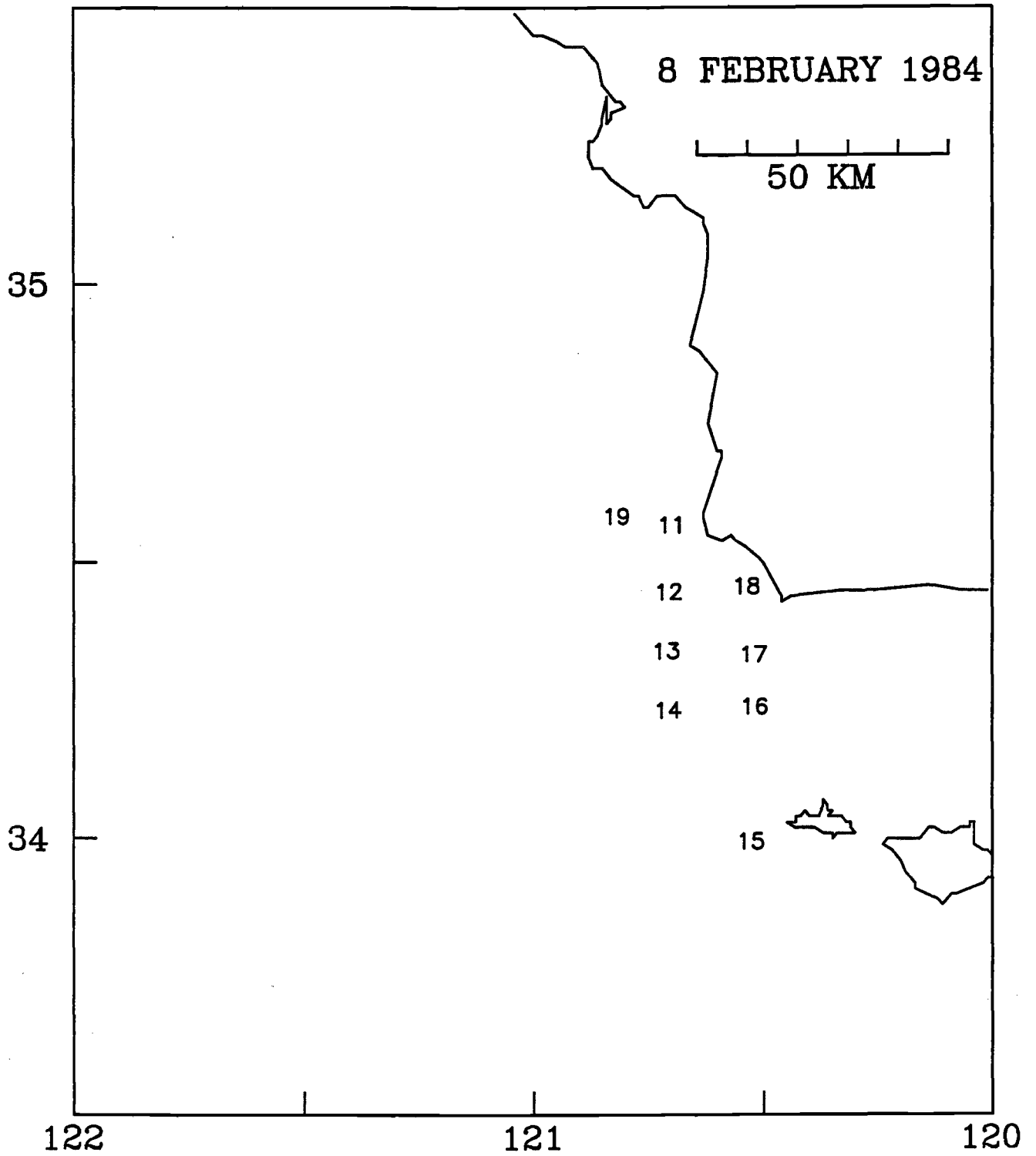
CRUISE 8401 - FEBRUARY 1984

DRIFTER NUMBER	NUMBER OBS	RELEASE LAT	RELEASE LON	RELEASE TIME	LAST OBS TIME
1	25	34.58	121.44	34.44 (3 Feb.)	45.47 (14 Feb.)
2	25	34.61	121.34	34.44 (3 Feb.)	45.59 (14 Feb.)
3	19	34.65	121.25	34.44 (3 Feb.)	41.43 (10 Feb.)
4	27	34.69	121.16	34.45 (3 Feb.)	45.58 (14 Feb.)
5	26	34.73	121.08	34.45 (3 Feb.)	45.59 (14 Feb.)
6	24	34.83	120.91	34.45 (3 Feb.)	45.45 (14 Feb.)
7	24	34.87	120.84	34.45 (3 Feb.)	43.57 (12 Feb.)
8	7	34.93	120.75	34.46 (3 Feb.)	36.62 (5 Feb.)
9	25	34.59	120.97	34.47 (3 Feb.)	45.46 (14 Feb.)
10	26	34.74	120.82	34.47 (3 Feb.)	45.58 (14 Feb.)
11	14	34.55	120.73	39.62 (8 Feb.)	45.55 (14 Feb.)
12	13	34.43	120.74	39.62 (8 Feb.)	45.51 (14 Feb.)
13	11	34.33	120.74	39.63 (8 Feb.)	43.47 (12 Feb.)
14	13	34.22	120.74	39.63 (8 Feb.)	45.50 (14 Feb.)
15	13	33.98	120.56	39.63 (8 Feb.)	45.56 (14 Feb.)
16	11	34.23	120.55	39.64 (8 Feb.)	43.49 (12 Feb.)
17	8	34.32	120.55	39.64 (8 Feb.)	42.46 (11 Feb.)
18	11	34.45	120.57	39.65 (8 Feb.)	43.50 (12 Feb.)
19	13	34.57	120.85	39.66 (8 Feb.)	45.59 (14 Feb.)

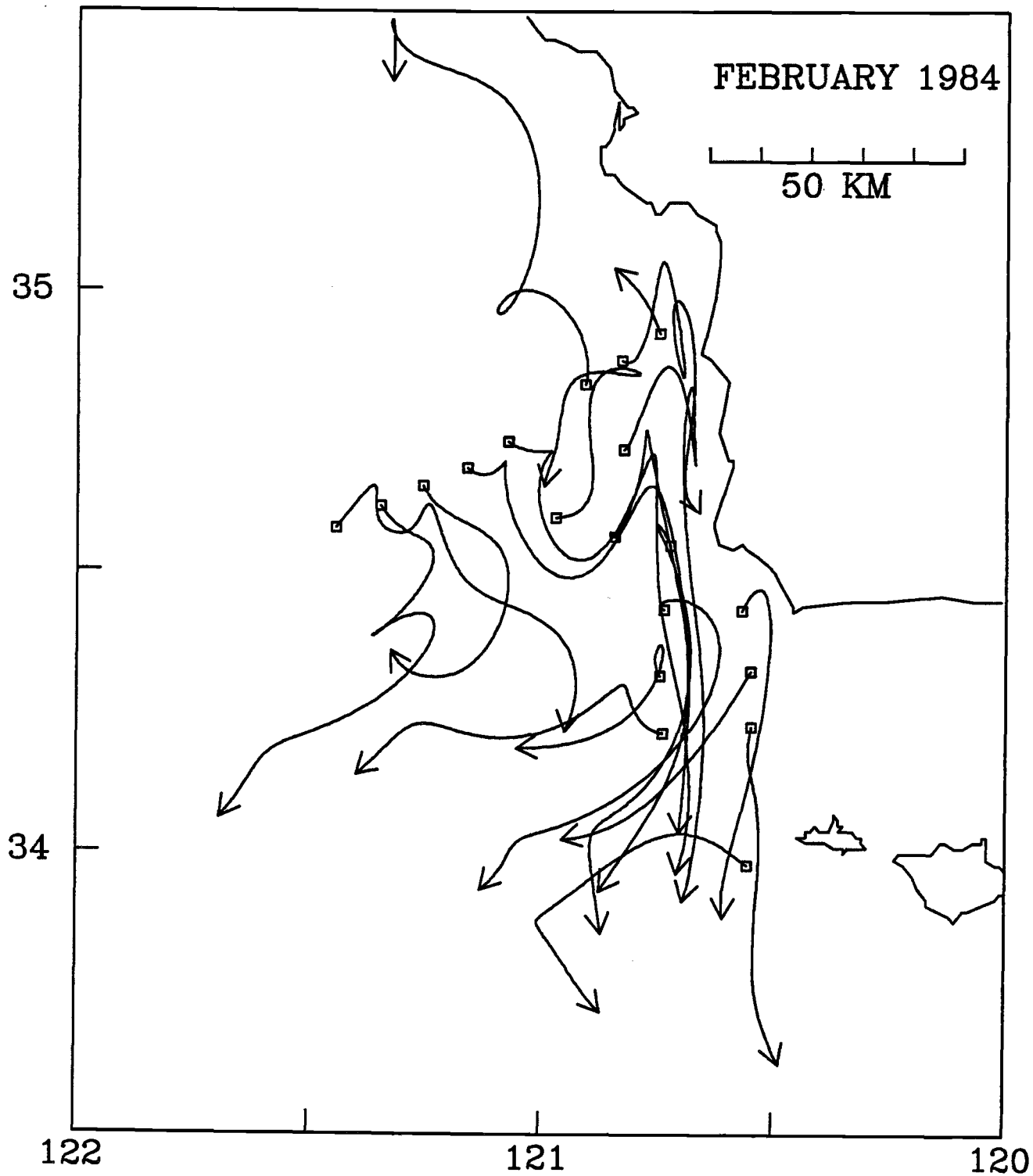
CRUISE 8401 DRIFTERS 1 - 10



CRUISE 8401 DRIFTERS 11 - 19



CRUISE 8401 DRIFTERS 1 - 19



CRUISE 8401 DRIFTERS 1 - 10

3 FEBRUARY 1984

50 KM

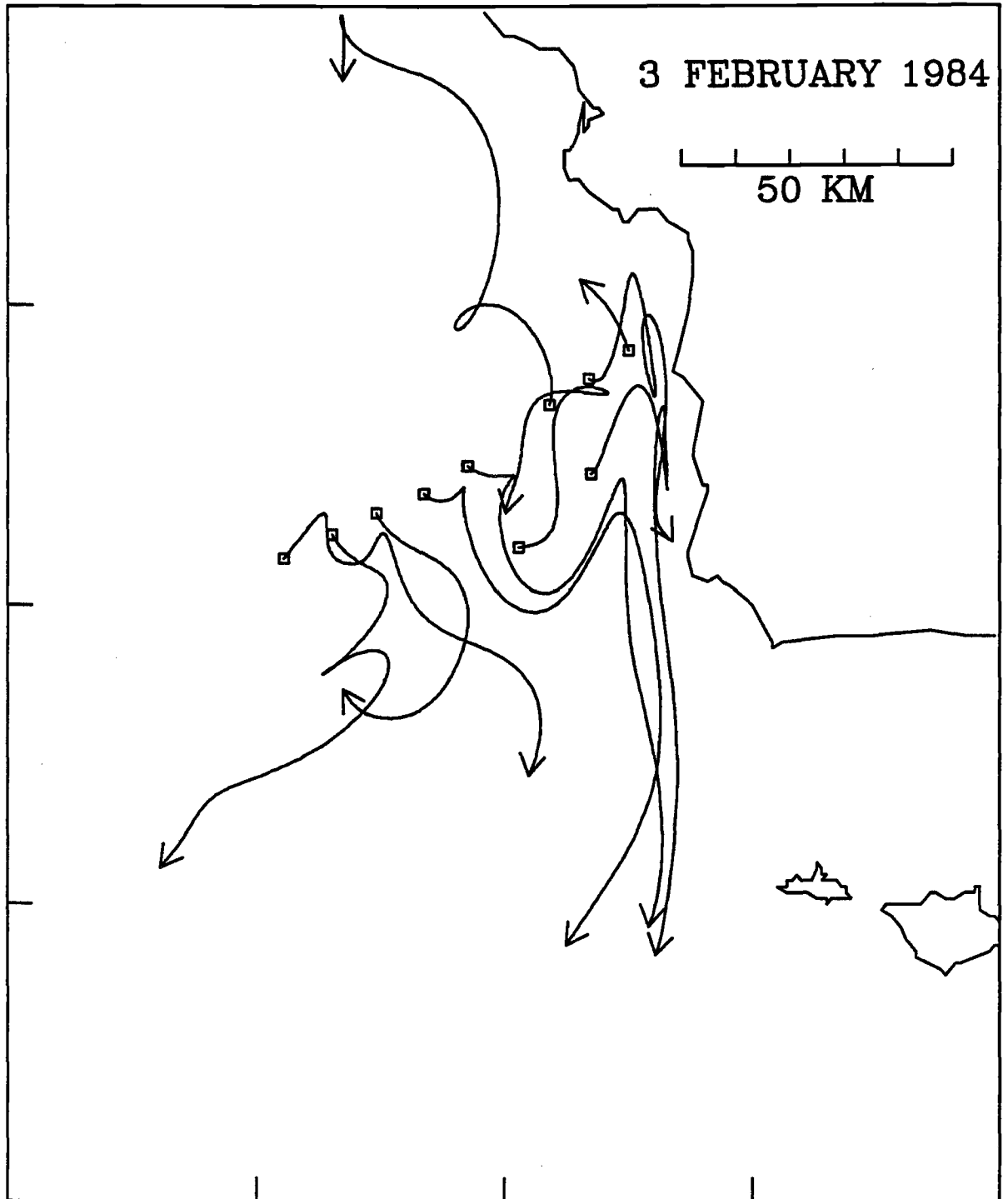
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34

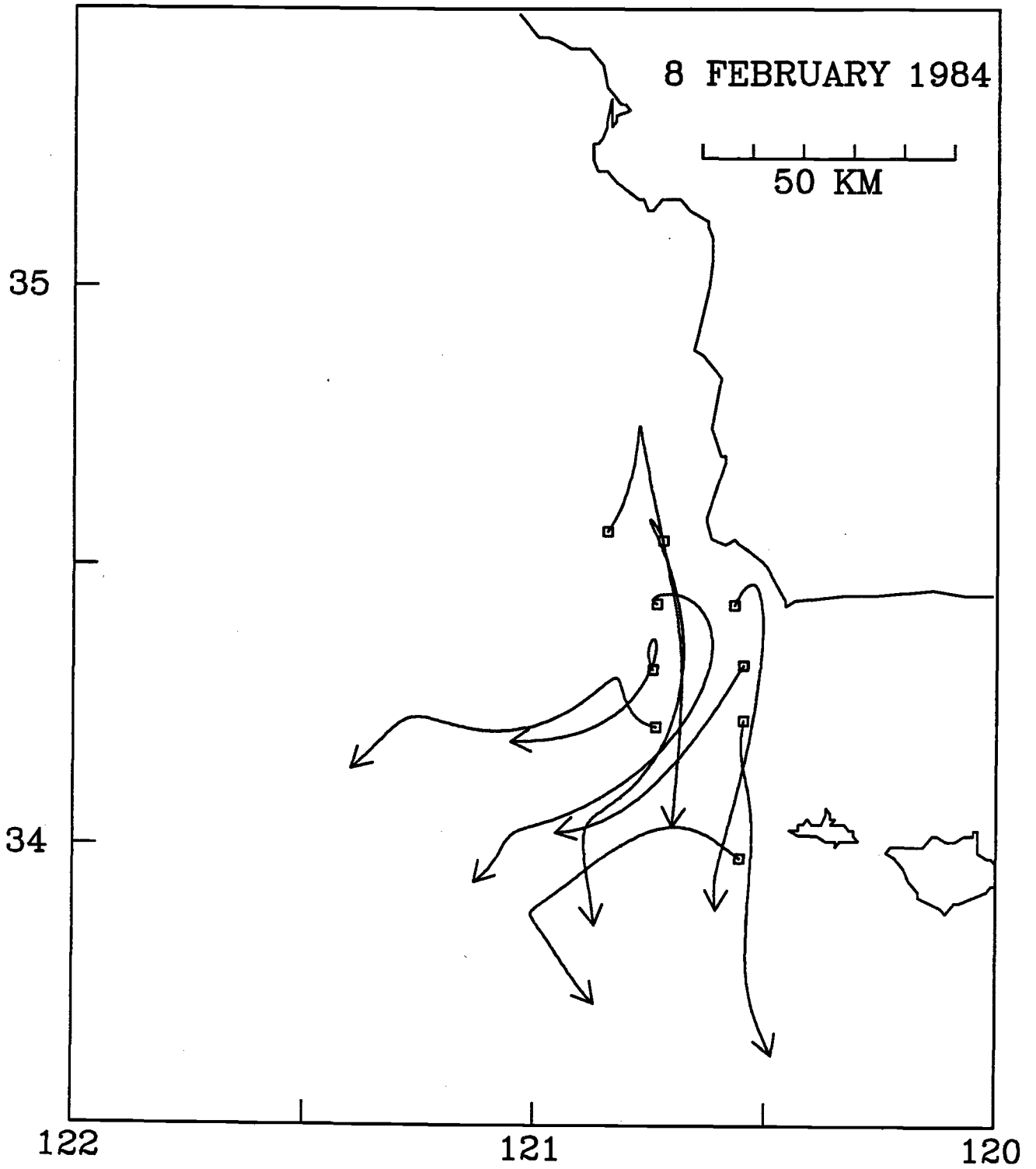
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121

120



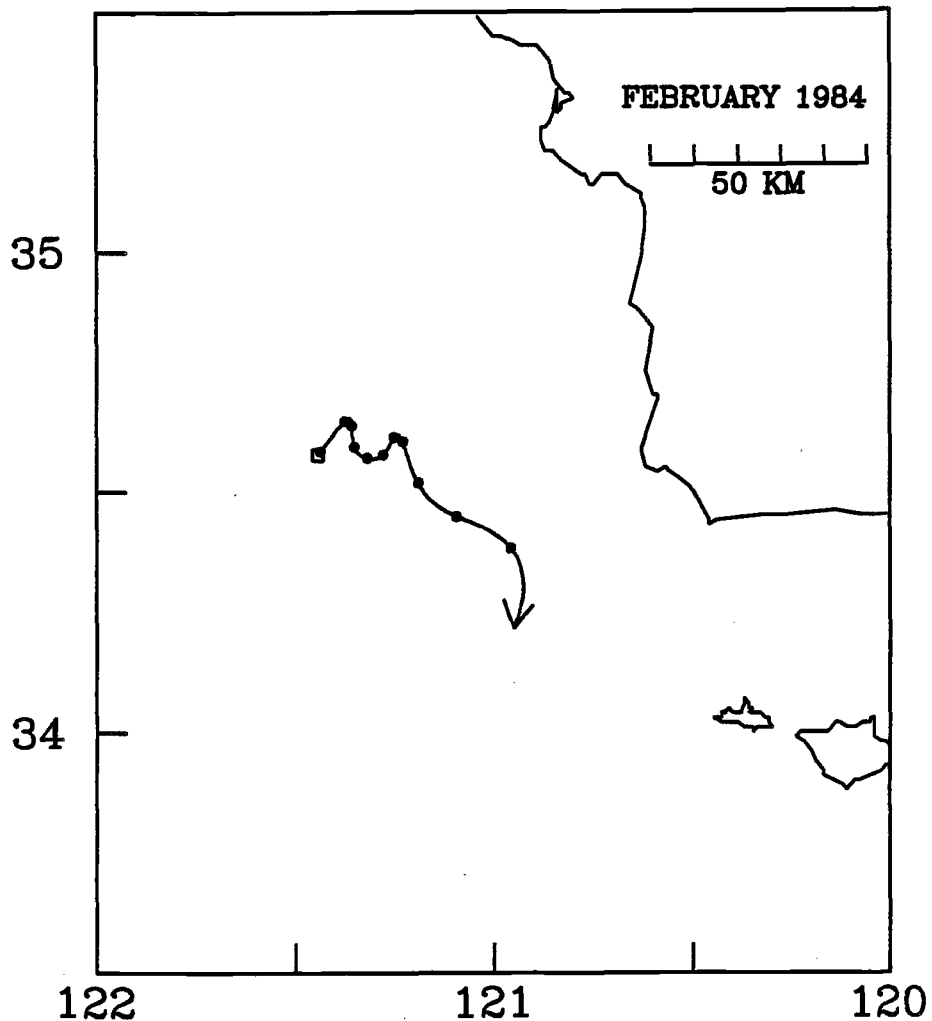
CRUISE 8401 DRIFTERS 11 - 19



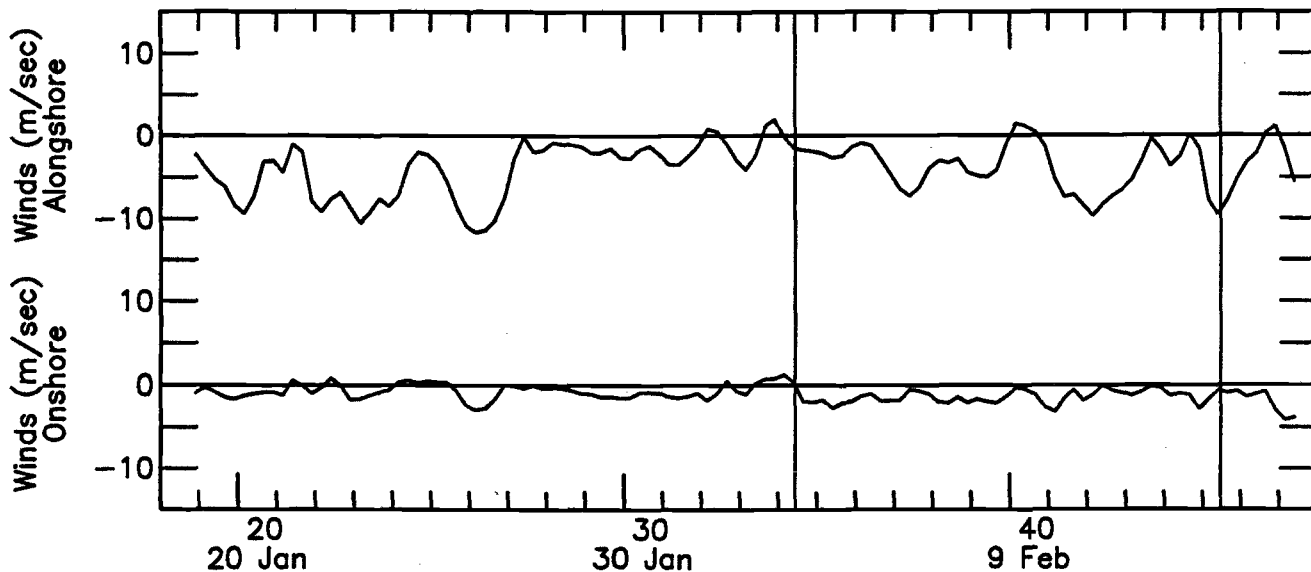
DRIFTER 1

DRIFTER 1

TIME (days)	LAT (deg N)	LON (deg W)	SPEED (km/day)
34.44	34.58	121.44	
34.49	34.59	121.44	18.51
34.63	34.60	121.43	12.58
35.63	34.65	121.38	7.11
35.99	34.65	121.37	2.17
36.42	34.66	121.36	3.87
36.64	34.64	121.35	8.30
36.97	34.61	121.35	11.02
37.41	34.59	121.37	6.97
37.64	34.59	121.37	1.85
37.98	34.58	121.34	8.75
38.41	34.58	121.32	3.91
38.65	34.58	121.31	6.87
38.97	34.57	121.27	10.28
39.44	34.58	121.30	4.71
39.68	34.58	121.28	6.21
39.96	34.58	121.27	2.33
40.97	34.63	121.24	6.33
41.41	34.60	121.24	7.03
41.98	34.57	121.22	7.30
42.68	34.50	121.17	12.02
43.00	34.46	121.14	18.44
43.44	34.47	121.13	2.12
44.66	34.36	120.93	17.48
45.47	34.21	120.96	20.22



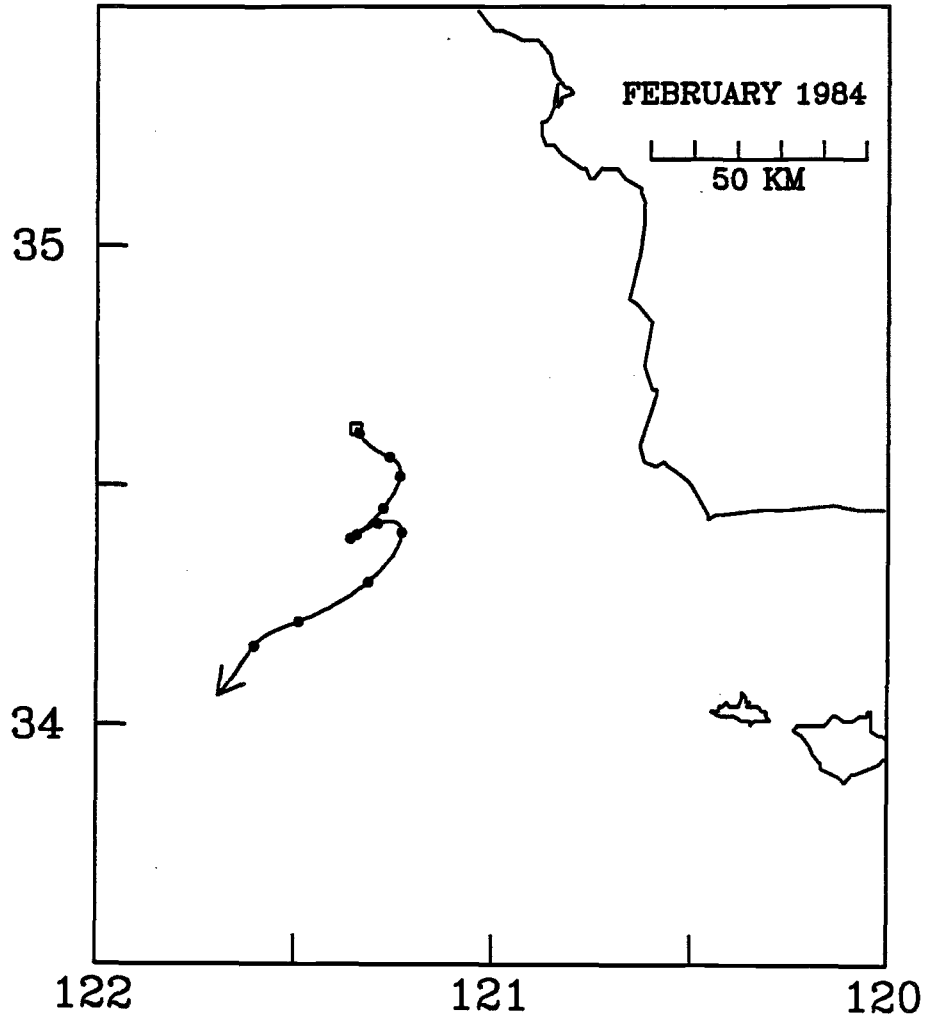
NDBC Buoy 46028



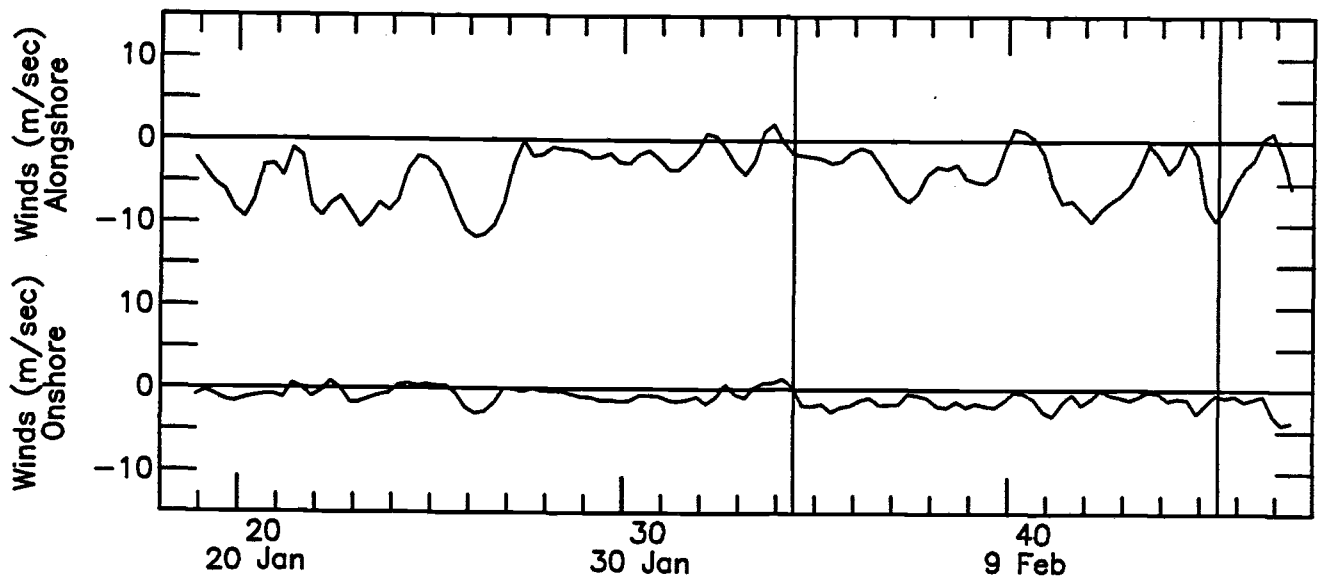
DRIFTER 2

DRIFTER 2

TIME (days)	LAT (deg N)	LON (deg W)	SPEED (km/day)
34.44	34.81	121.34	
34.49	34.82	121.34	10.88
34.64	34.81	121.33	9.20
35.63	34.55	121.26	9.70
36.00	34.55	121.25	2.22
36.43	34.55	121.23	3.63
36.65	34.53	121.23	12.97
36.98	34.47	121.22	19.07
37.43	34.45	121.28	12.12
37.84	34.45	121.32	15.54
37.98	34.43	121.31	6.98
38.41	34.41	121.34	7.54
38.66	34.42	121.36	8.38
38.98	34.38	121.32	18.02
39.45	34.38	121.37	10.67
39.67	34.40	121.37	12.89
39.96	34.39	121.34	10.82
40.97	34.43	121.25	8.71
41.42	34.41	121.24	6.00
41.98	34.34	121.24	14.37
42.69	34.29	121.35	16.22
43.01	34.23	121.40	26.90
43.45	34.22	121.50	21.76
44.64	34.15	121.80	10.42
45.49	34.06	121.71	16.52



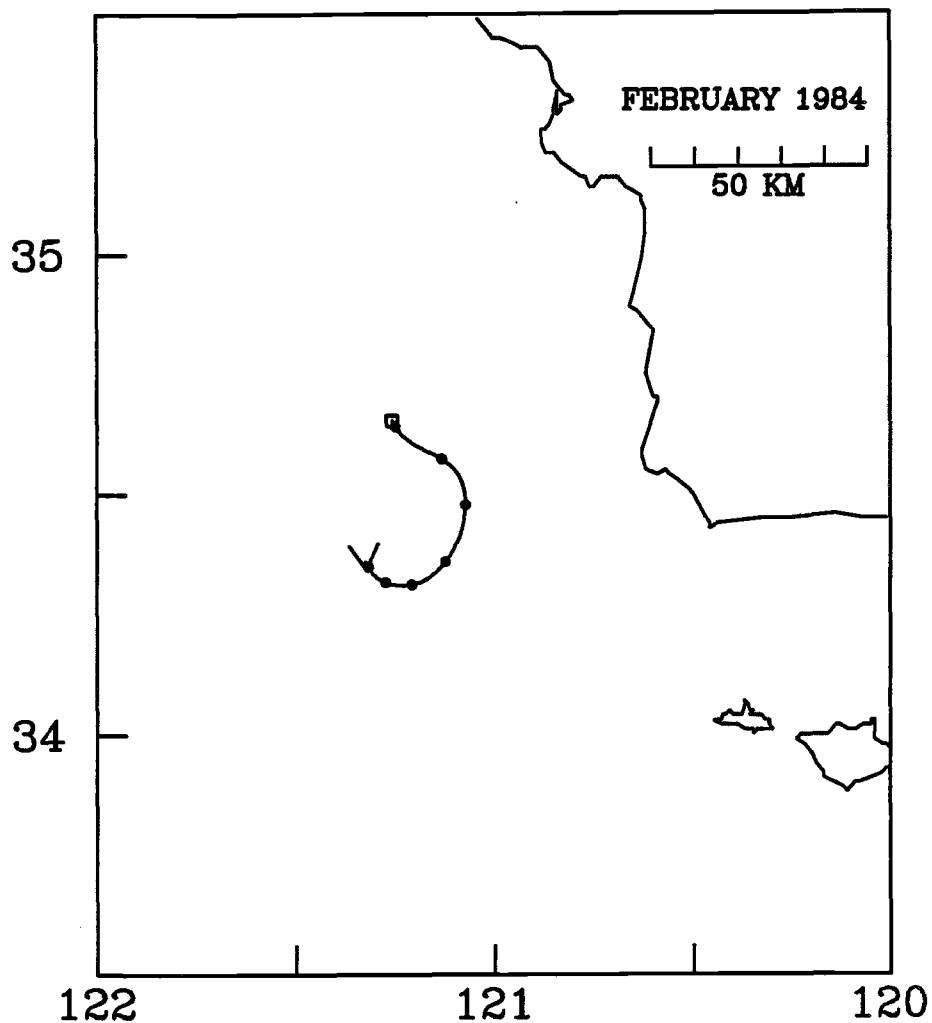
NDBC Buoy 46028



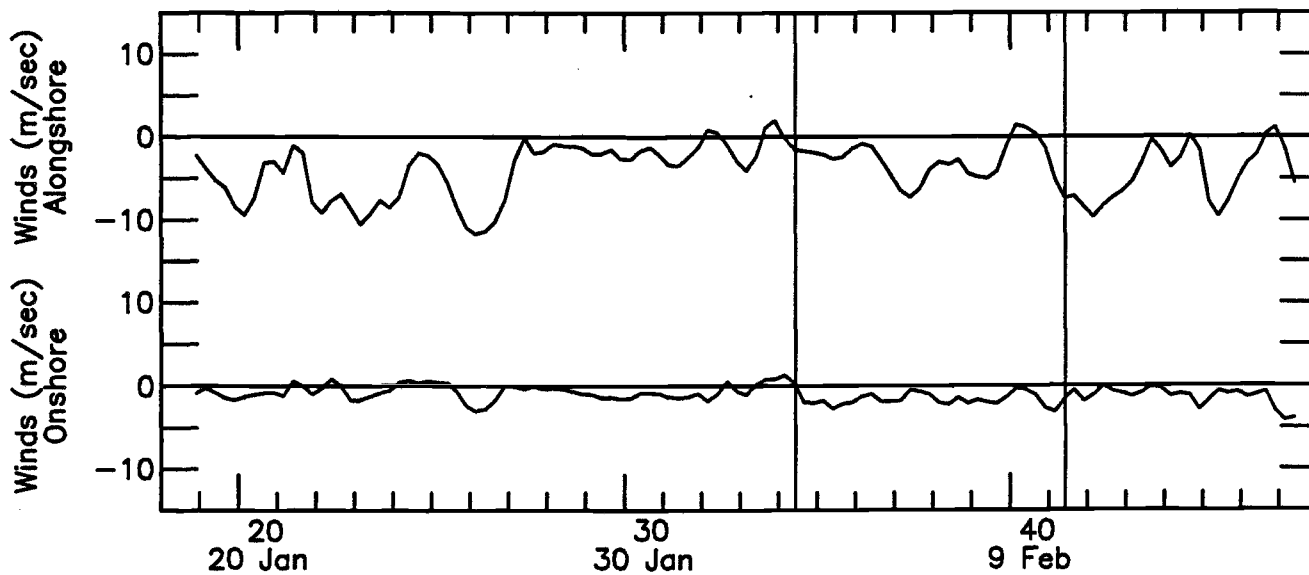
DRIFTER 3

DRIFTER 3

TIME (days)	LAT (deg N)	LON (deg W)	SPEED (km/day)
34.44	34.85	121.25	
34.49	34.85	121.25	12.78
34.64	34.83	121.23	12.73
35.62	34.56	121.13	12.99
36.01	34.54	121.10	9.98
36.43	34.50	121.05	14.75
36.65	34.47	121.06	15.21
36.99	34.42	121.10	21.32
37.43	34.35	121.13	18.43
37.65	34.35	121.17	14.13
37.99	34.32	121.15	12.10
38.42	34.31	121.21	11.84
38.68	34.34	121.21	11.28
38.98	34.30	121.22	13.98
39.46	34.31	121.29	13.97
39.67	34.32	121.31	8.72
39.97	34.32	121.29	6.25
40.98	34.37	121.32	6.63
41.43	34.33	121.33	8.99



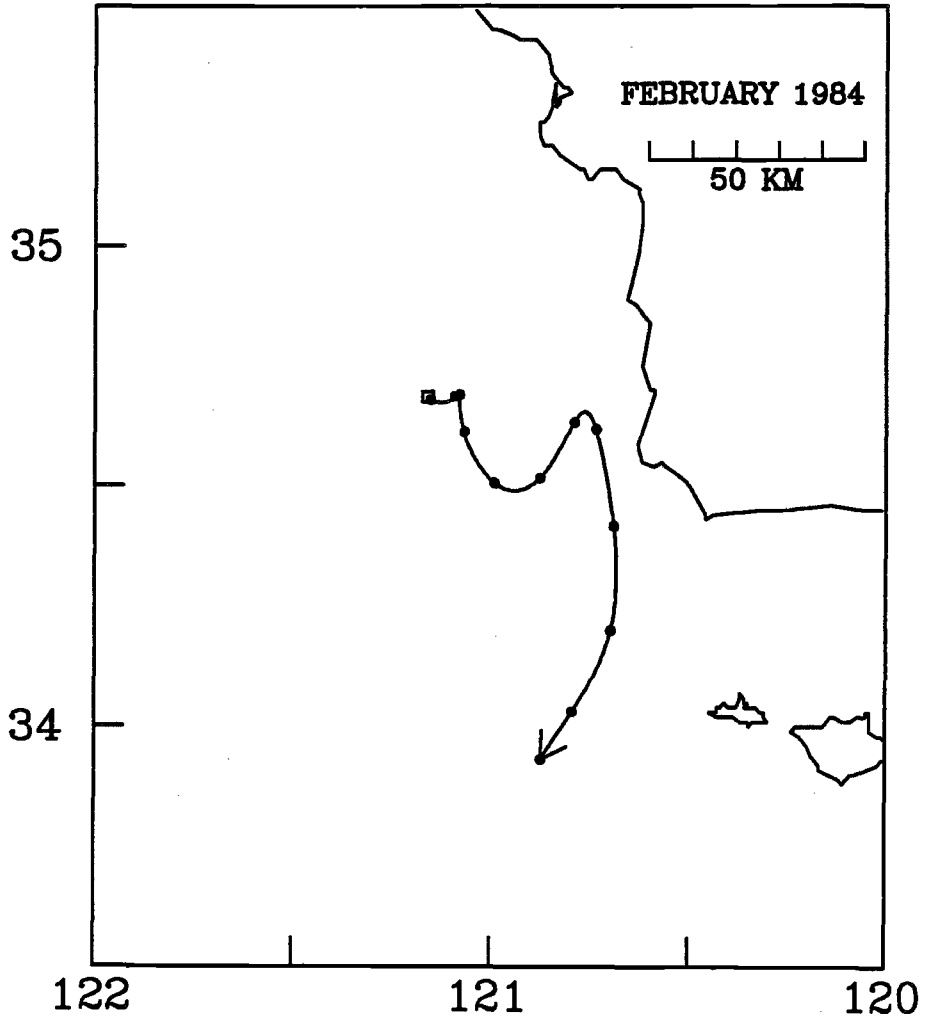
NDBC Buoy 46028



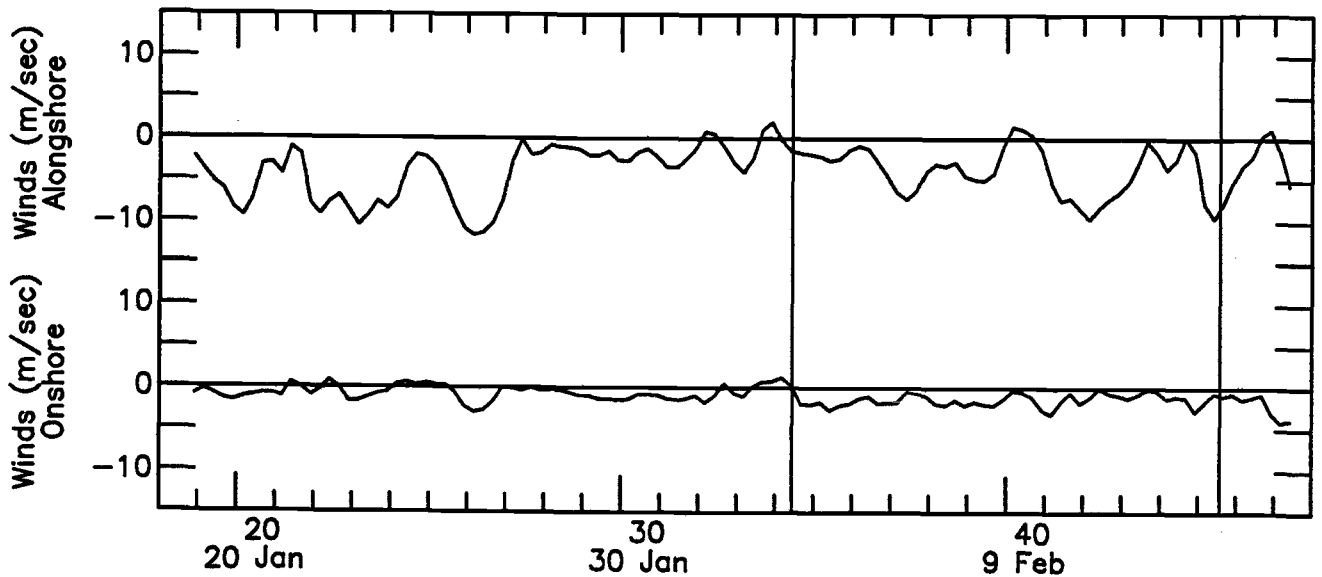
DRIFTER 4

DRIFTER 4

TIME (days)	LAT (deg N)	LON (deg W)	SPEED (km/day)
34.45	34.89	121.16	
34.50	34.89	121.15	12.98
34.84	34.88	121.15	9.12
35.62	34.69	121.10	4.94
36.01	34.72	121.08	9.40
36.45	34.71	121.07	4.71
36.86	34.89	121.08	11.08
37.00	34.86	121.09	10.51
37.44	34.82	121.10	8.74
37.87	34.59	121.09	18.17
37.99	34.56	121.02	23.62
38.43	34.51	120.98	13.85
38.89	34.53	120.96	10.60
38.99	34.50	120.92	15.67
39.47	34.50	120.91	2.33
39.86	34.52	120.88	20.20
39.98	34.58	120.82	25.85
40.74	34.67	120.76	15.67
40.99	34.67	120.75	4.48
41.45	34.82	120.74	13.69
41.82	34.59	120.74	18.26
42.05	34.50	120.72	23.55
42.52	34.43	120.71	16.09
43.06	34.28	120.64	31.89
43.53	34.19	120.71	26.16
44.54	34.02	120.80	20.14
45.58	33.93	120.87	11.76



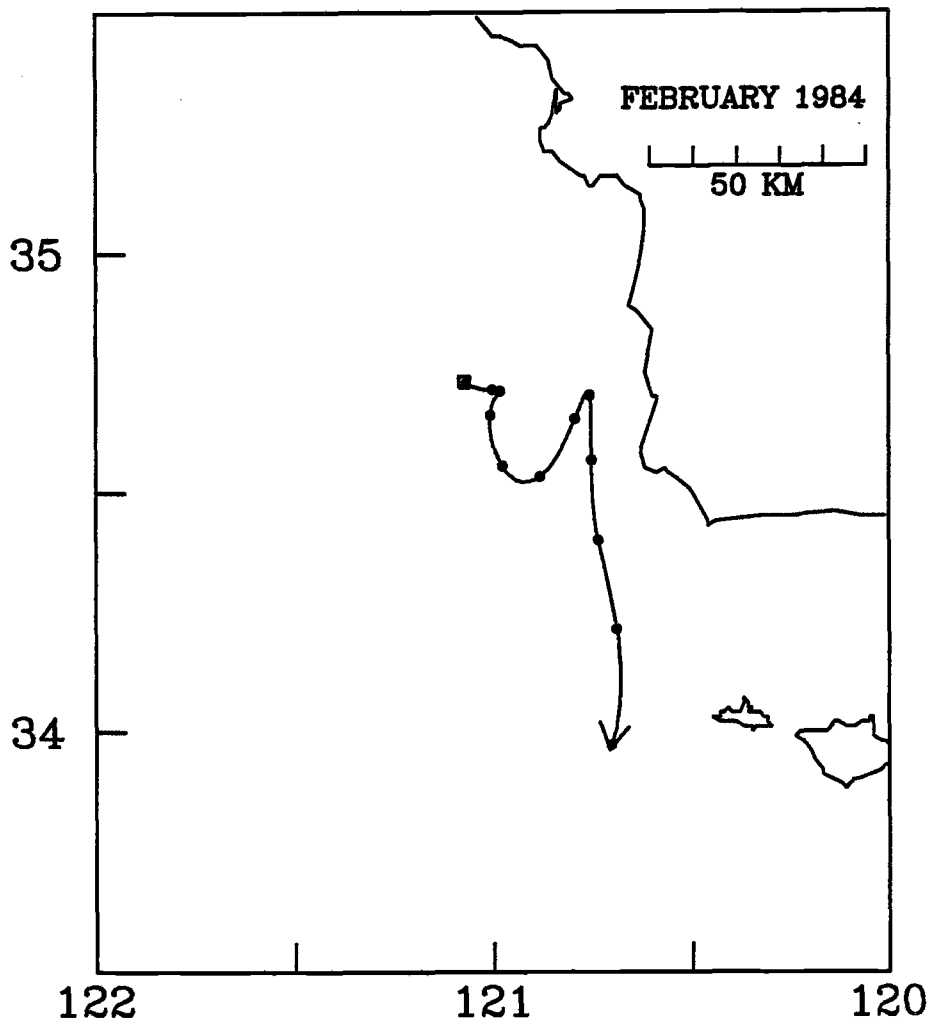
NDBC Buoy 46028



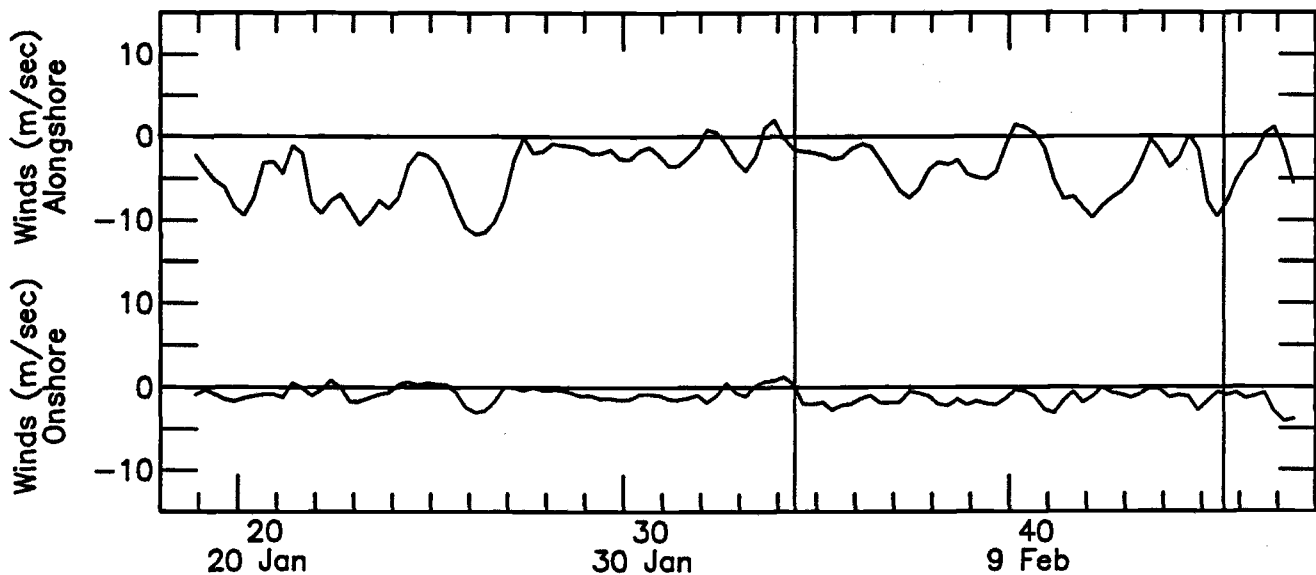
DRIFTER 5

DRIFTER 5

TIME (days)	LAT (deg N)	LON (deg W)	SPEED (km/day)
34.45	34.73	121.08	
34.50	34.73	121.07	12.23
34.65	34.73	121.05	12.79
35.62	34.72	121.00	4.69
36.02	34.71	121.01	3.59
36.45	34.72	120.98	7.05
36.66	34.73	120.97	3.47
37.00	34.70	120.98	8.78
37.45	34.67	121.02	11.81
37.88	34.64	121.03	13.59
37.99	34.60	121.02	12.99
38.44	34.56	120.99	12.63
38.69	34.56	120.95	11.28
38.99	34.53	120.91	17.88
39.47	34.54	120.90	2.97
39.98	34.56	120.84	12.28
40.73	34.68	120.79	19.00
40.99	34.71	120.77	14.41
41.45	34.72	120.76	1.81
41.63	34.71	120.75	5.55
42.05	34.62	120.74	22.86
42.53	34.56	120.75	15.03
43.07	34.46	120.76	19.71
43.53	34.41	120.74	13.43
44.52	34.20	120.68	23.68
45.59	33.96	120.71	25.83



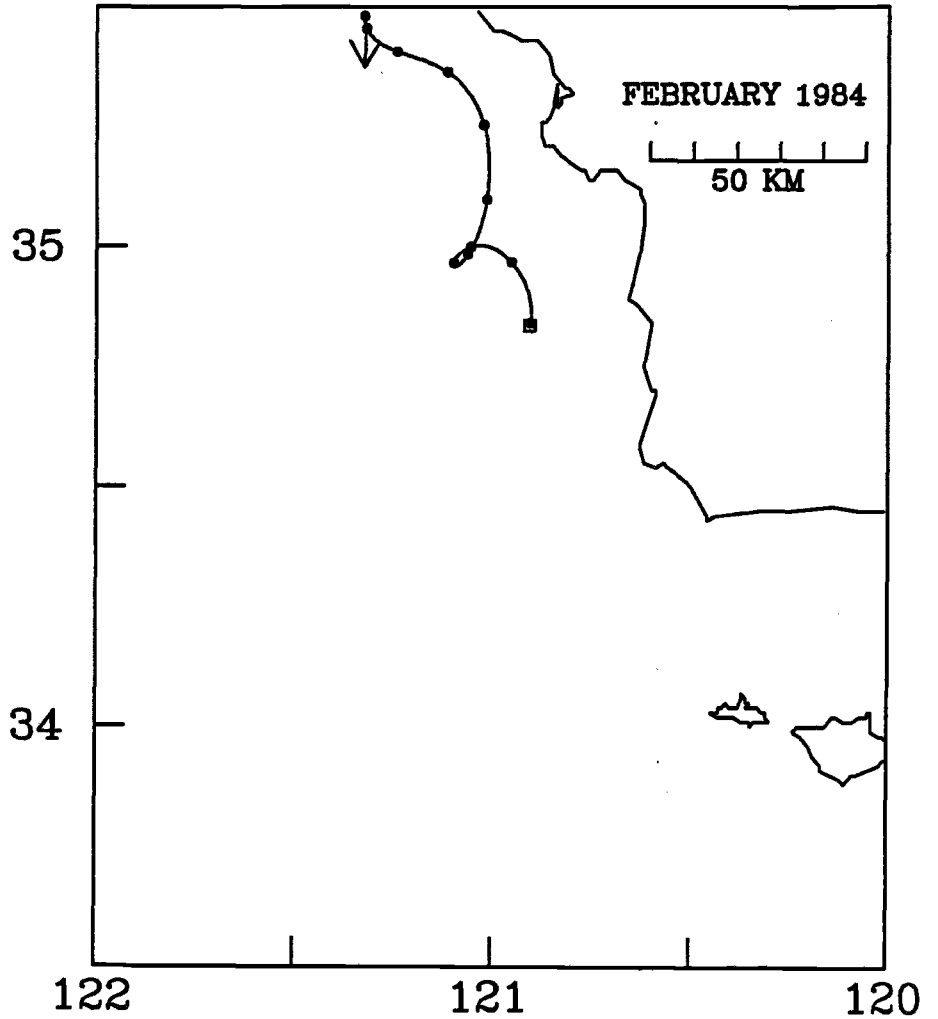
NDBC Buoy 46028



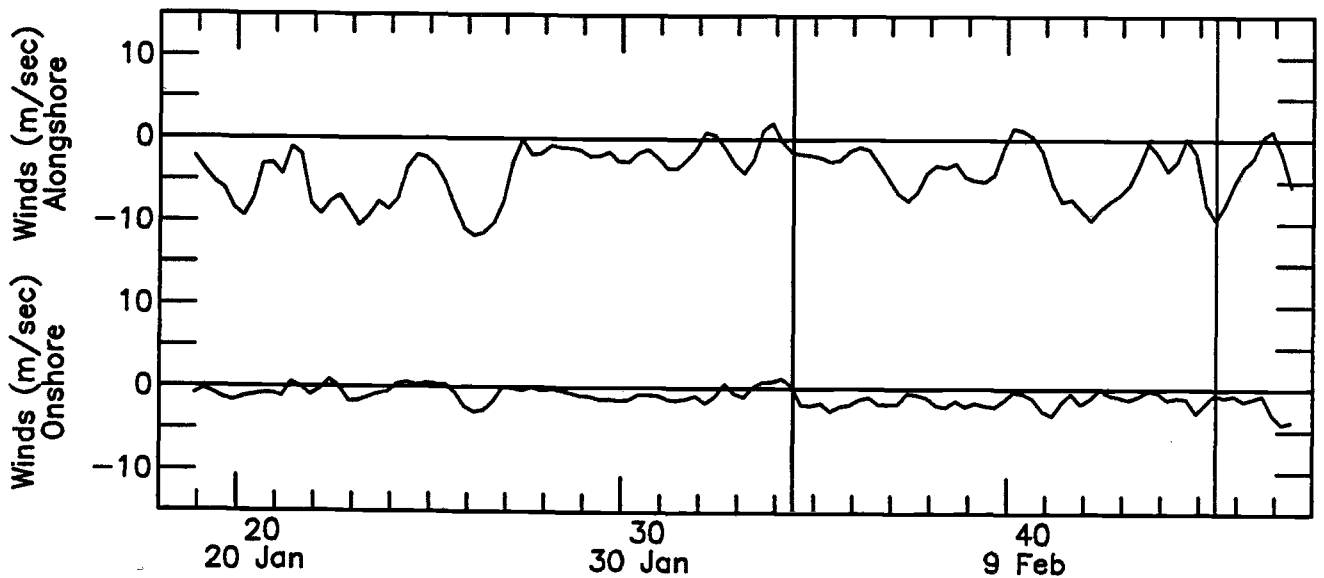
DRIFTER 6

DRIFTER 6

TIME (days)	LAT (deg N)	LON (deg W)	SPEED (km/day)
34.45	34.83	120.91	
34.51	34.84	120.90	25.60
34.65	34.85	120.90	9.38
35.66	34.97	120.97	14.34
36.03	34.99	121.01	11.77
36.46	35.00	121.05	8.49
36.62	35.01	121.07	16.09
36.96	34.96	121.10	16.44
37.40	34.95	121.09	4.53
37.63	34.97	121.10	12.63
37.97	34.94	121.07	12.50
38.39	34.98	121.07	10.97
38.63	35.01	121.08	12.71
38.96	35.01	121.03	14.11
39.42	35.09	121.02	18.19
39.71	35.14	121.02	21.50
39.94	35.16	121.00	9.27
40.95	35.32	121.07	19.51
41.73	35.39	121.14	12.95
41.96	35.37	121.17	14.71
42.66	35.43	121.27	15.43
42.99	35.42	121.30	9.00
43.60	35.47	121.32	8.49
45.45	35.37	121.33	5.96



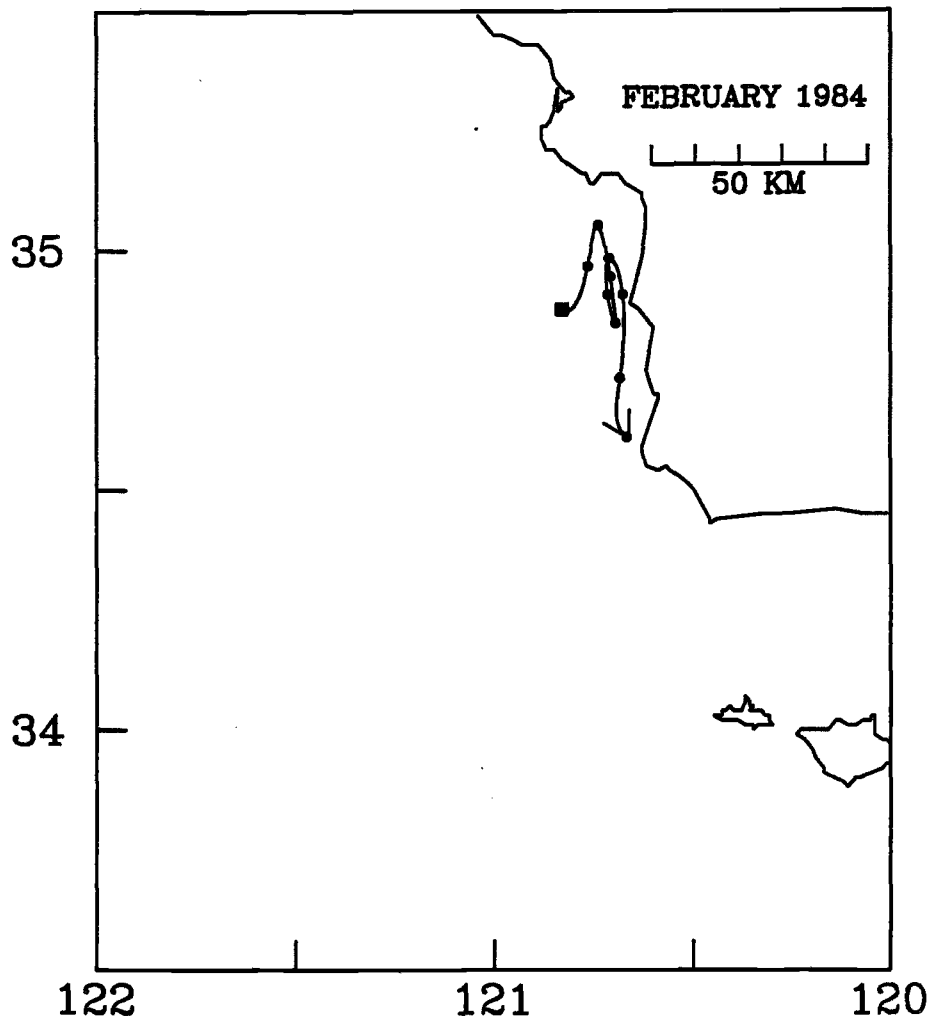
NDBC Buoy 46028



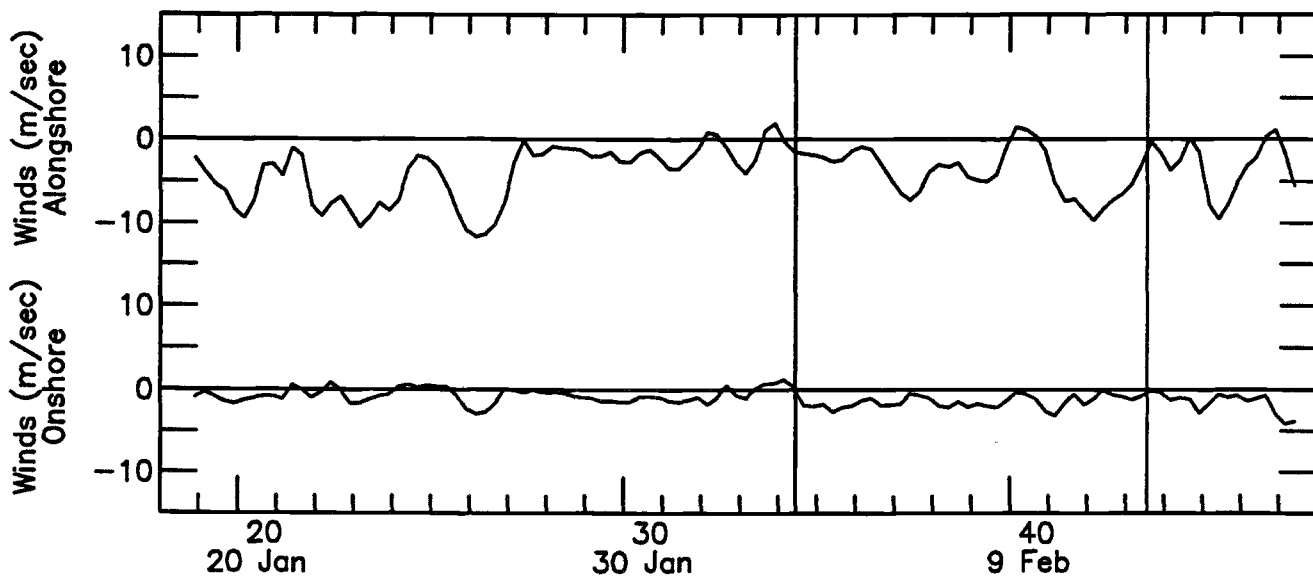
DRIFTER 7

DRIFTER 7

TIME (days)	LAT (deg N)	LON (deg W)	SPEED (km/day)
34.45	34.87	120.84	
34.51	34.88	120.82	30.30
34.66	34.88	120.81	10.81
35.69	35.00	120.76	12.94
36.05	35.03	120.75	10.22
36.47	35.07	120.75	10.84
36.61	35.06	120.74	12.37
36.69	35.06	120.73	17.36
36.94	35.02	120.69	19.36
37.38	34.96	120.72	17.55
37.62	34.93	120.72	14.13
37.96	34.89	120.71	13.84
38.38	34.84	120.69	12.77
38.62	34.86	120.68	8.26
38.95	34.88	120.70	9.07
39.41	34.90	120.71	6.11
39.69	34.92	120.73	8.50
40.03	34.95	120.72	12.13
40.72	34.99	120.72	5.29
41.38	34.94	120.68	9.50
41.71	34.88	120.67	21.12
42.43	34.73	120.66	22.37
43.08	34.66	120.73	14.91
43.56	34.60	120.64	21.97



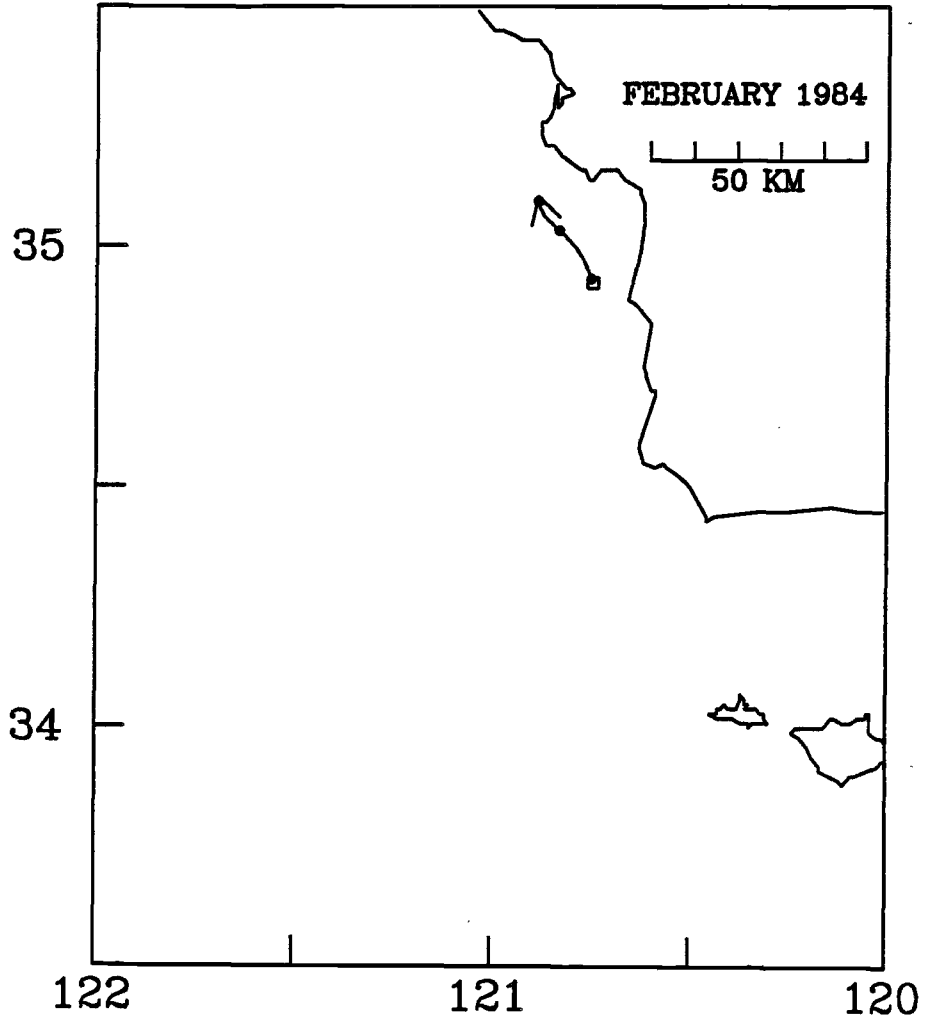
NDBC Buoy 46028



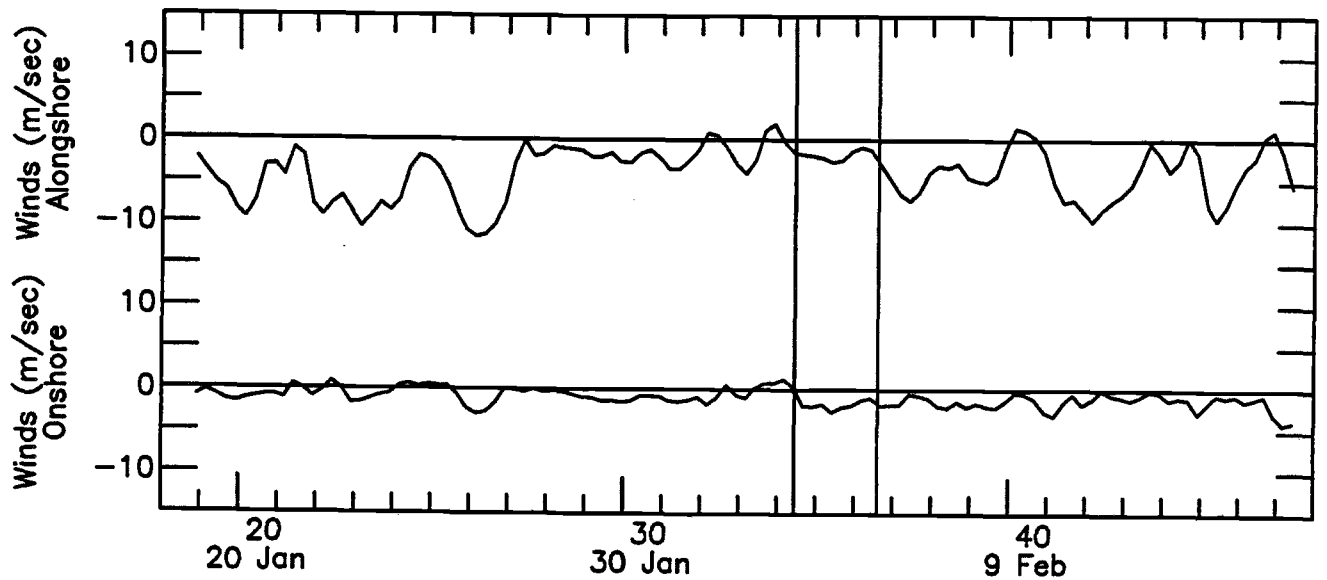
DRIFTER 8

DRIFTER 8

TIME (days)	LAT (deg N)	LON (deg W)	SPEED (km/day)
34.46	34.92	120.75	
34.51	34.94	120.75	25.77
34.66	34.96	120.76	16.79
35.67	35.05	120.85	12.31
36.03	35.06	120.88	8.73
36.48	35.09	120.88	7.73
36.62	35.11	120.89	16.83



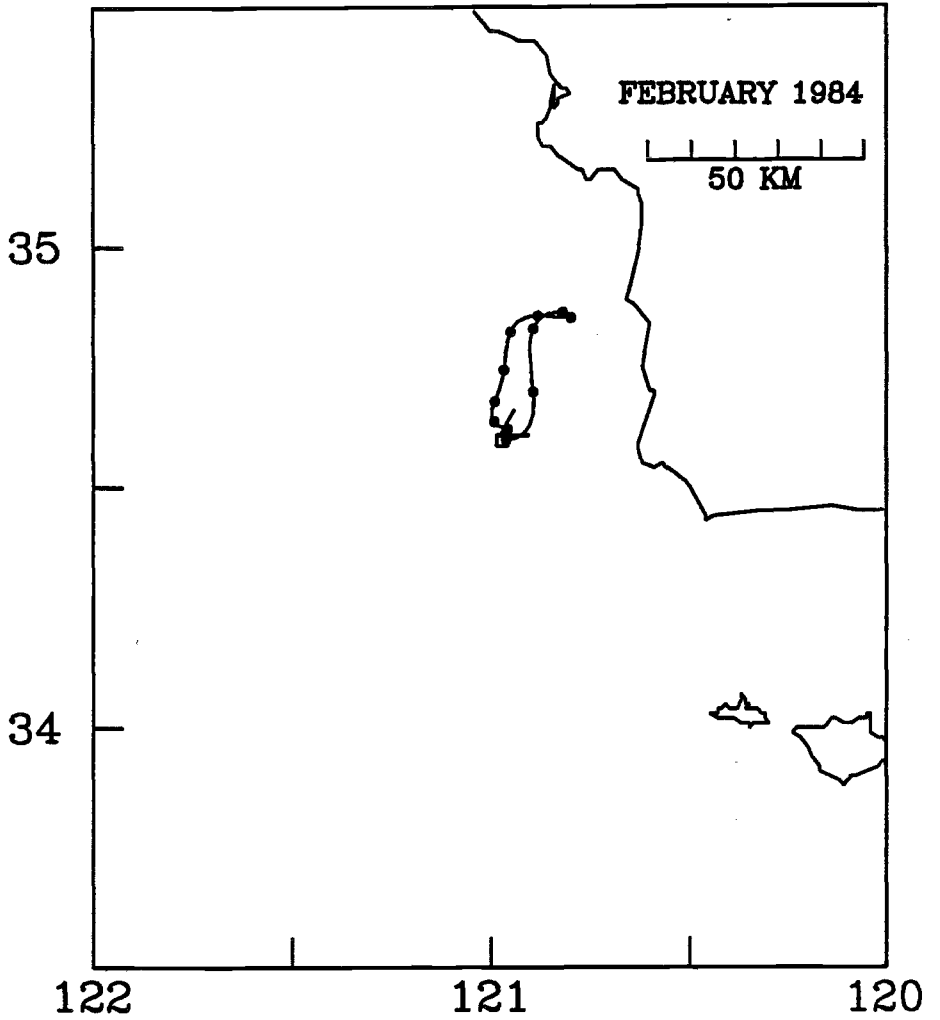
NDBC Buoy 46028



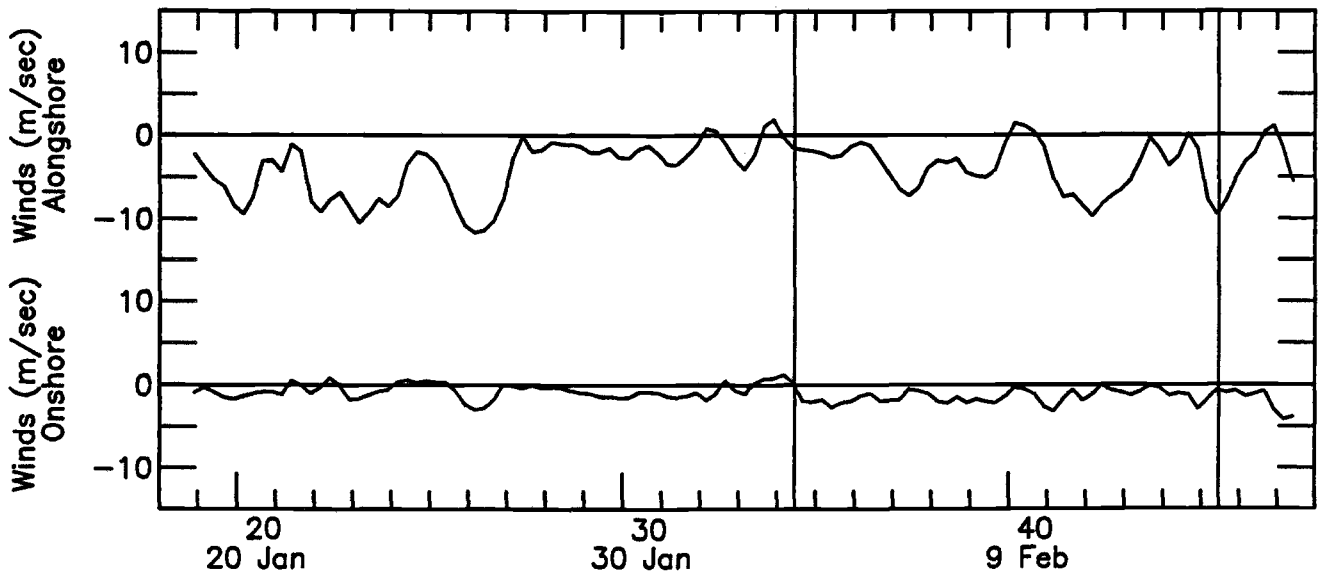
DRIFTER 9

DRIFTER 9

TIME (days)	LAT (deg N)	LON (deg W)	SPEED (km/day)
34.47	34.59	120.97	
34.48	34.60	120.97	124.04
34.69	34.60	120.93	18.54
35.68	34.72	120.90	13.30
36.04	34.79	120.90	19.88
36.49	34.84	120.90	12.78
36.67	34.85	120.87	12.51
37.01	34.85	120.85	5.90
37.47	34.87	120.86	3.99
37.71	34.87	120.81	19.20
38.01	34.85	120.81	6.29
38.38	34.88	120.79	9.09
38.63	34.88	120.77	6.40
38.96	34.81	120.76	22.25
39.42	34.83	120.91	30.00
39.70	34.88	120.95	24.80
39.94	34.90	120.97	10.47
40.96	34.75	120.79	23.32
41.39	34.77	121.08	60.89
41.97	34.72	120.99	16.85
42.67	34.69	120.99	4.90
43.00	34.63	120.98	20.64
43.43	34.65	121.00	6.29
44.67	34.62	120.96	3.67
45.46	34.61	120.98	2.92



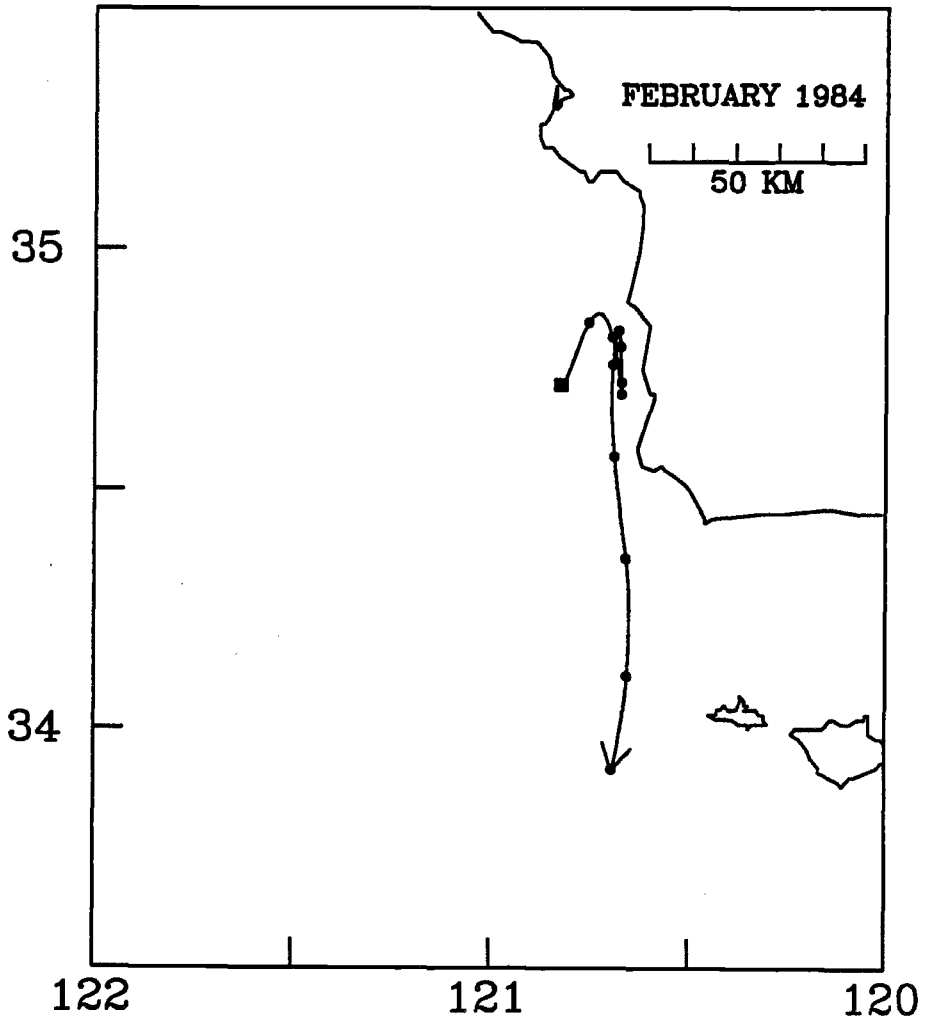
NDBC Buoy 46028



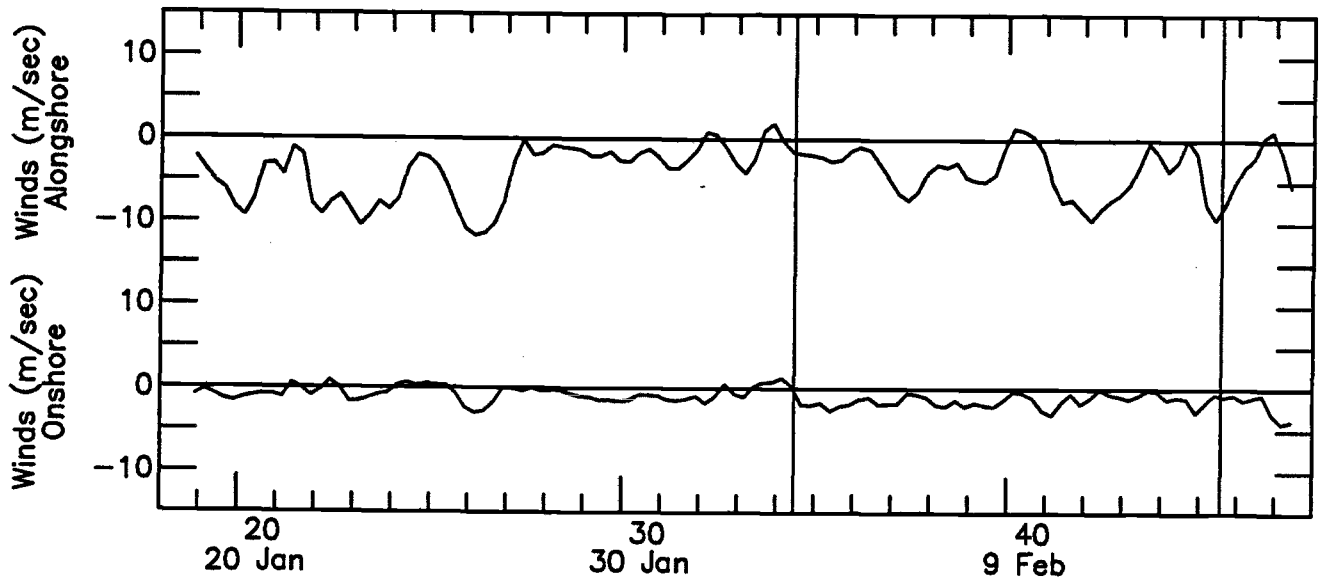
DRIFTER 10

DRIFTER 10

TIME (days)	LAT (deg N)	LON (deg W)	SPEED (km/day)
34.47	34.74	120.82	
34.47	34.72	120.83	711.77
34.70	34.72	120.81	6.13
35.65	34.86	120.75	16.31
36.04	34.87	120.71	12.16
36.49	34.85	120.69	5.88
36.67	34.82	120.68	22.60
37.01	34.73	120.69	29.23
37.46	34.69	120.69	9.16
37.69	34.69	120.66	10.89
38.00	34.70	120.67	5.00
38.45	34.76	120.68	13.81
38.71	34.78	120.66	10.42
39.00	34.76	120.67	7.79
39.49	34.80	120.68	9.47
39.69	34.82	120.67	12.29
40.03	34.79	120.69	9.61
41.05	34.85	120.69	5.88
41.53	34.78	120.68	16.39
41.71	34.74	120.67	24.04
42.06	34.63	120.72	35.07
42.44	34.54	120.70	28.20
43.07	34.51	120.70	5.61
43.56	34.32	120.62	45.01
44.53	34.10	120.67	25.78
45.58	33.91	120.69	19.74

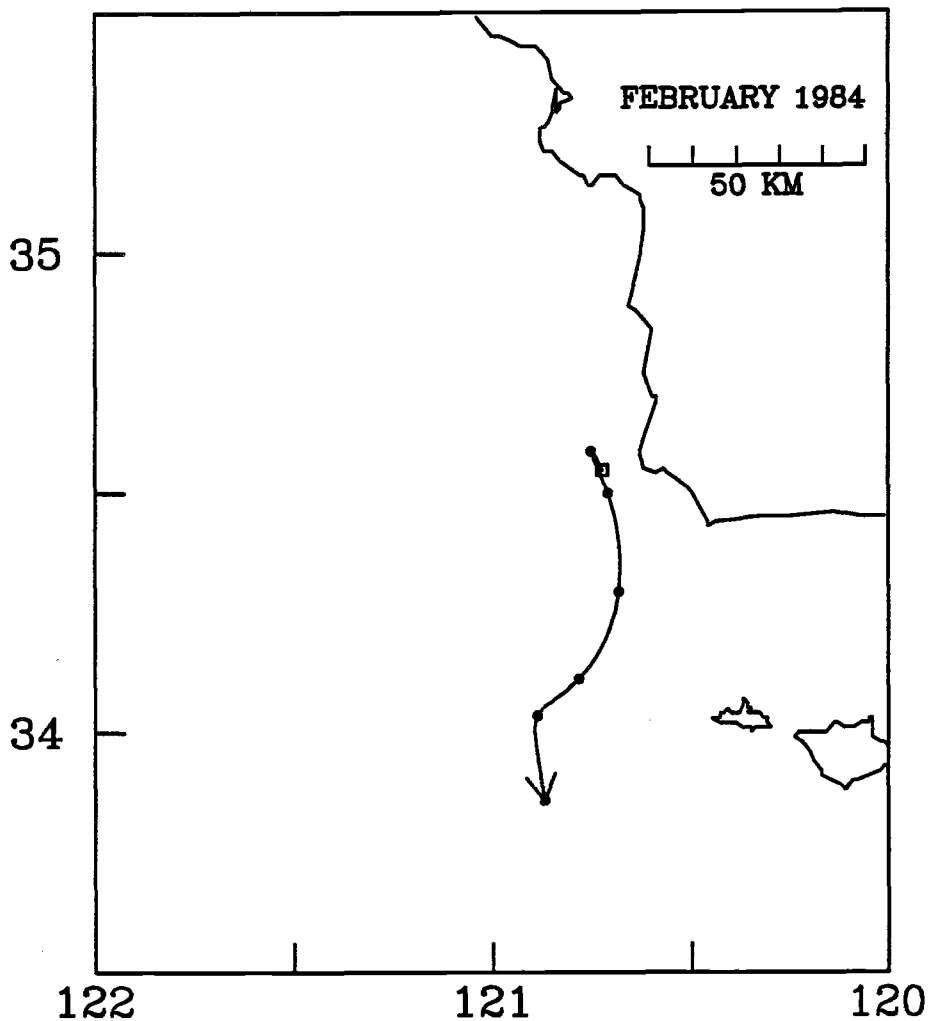


NDBC Buoy 46028

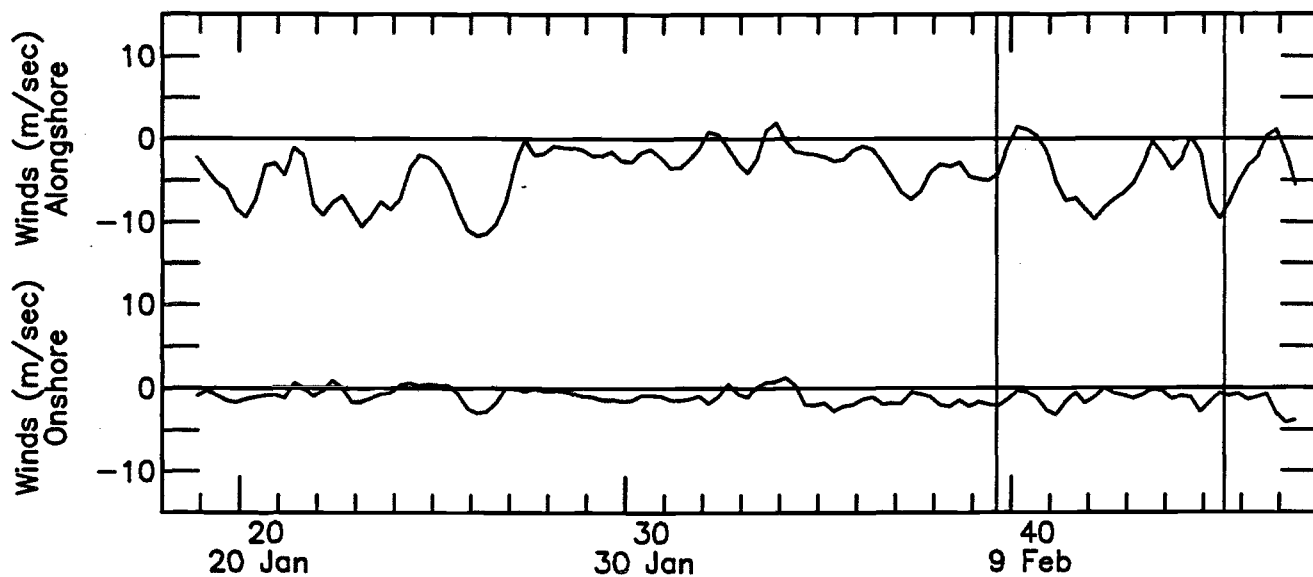


DRIFTER 11

DRIFTER	11		
TIME (days)	LAT (deg N)	LON (deg W)	SPEED (km/day)
39.82	34.56	120.73	
39.99	34.57	120.74	5.99
40.43	34.59	120.76	5.87
40.74	34.59	120.73	8.51
41.00	34.57	120.74	8.45
41.46	34.50	120.75	15.98
41.64	34.47	120.73	20.75
42.04	34.39	120.66	28.03
42.51	34.31	120.69	20.50
42.75	34.26	120.65	25.12
43.06	34.15	120.72	45.16
43.52	34.11	120.84	25.61
44.59	34.03	120.87	8.77
45.55	33.84	120.87	22.11

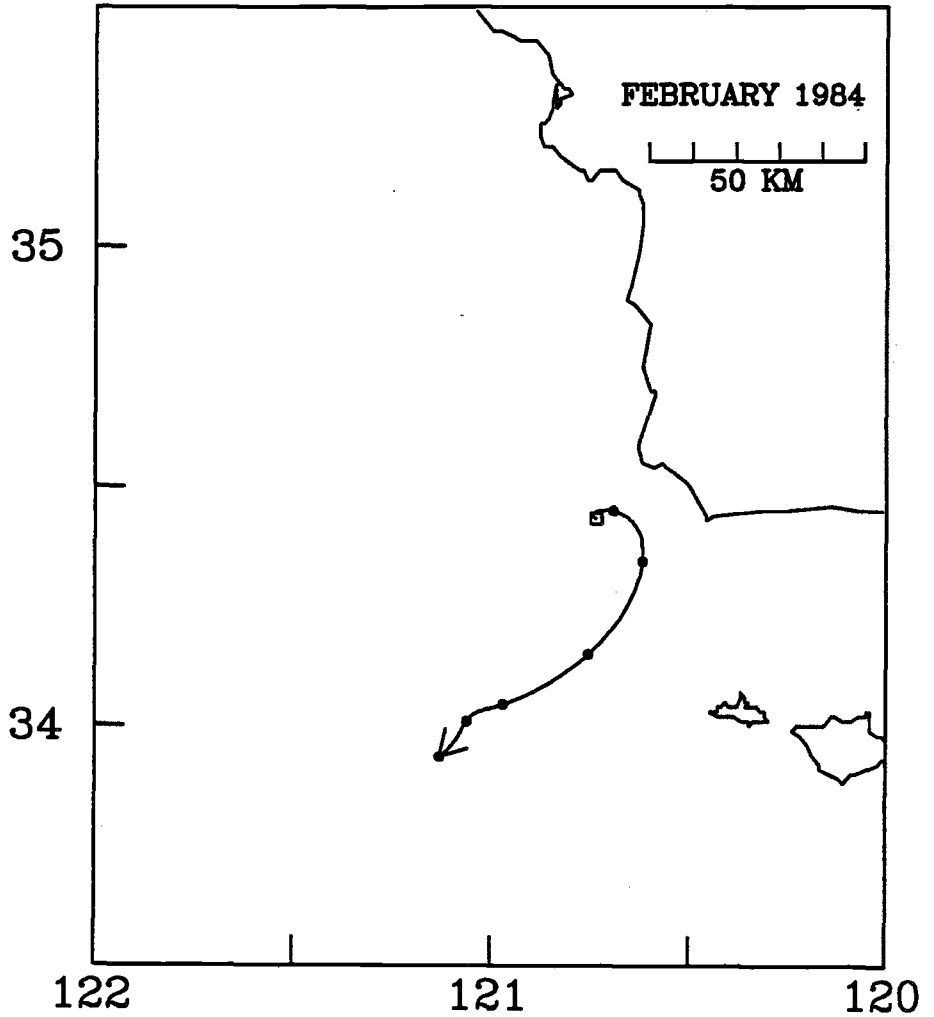


NDBC Buoy 46028

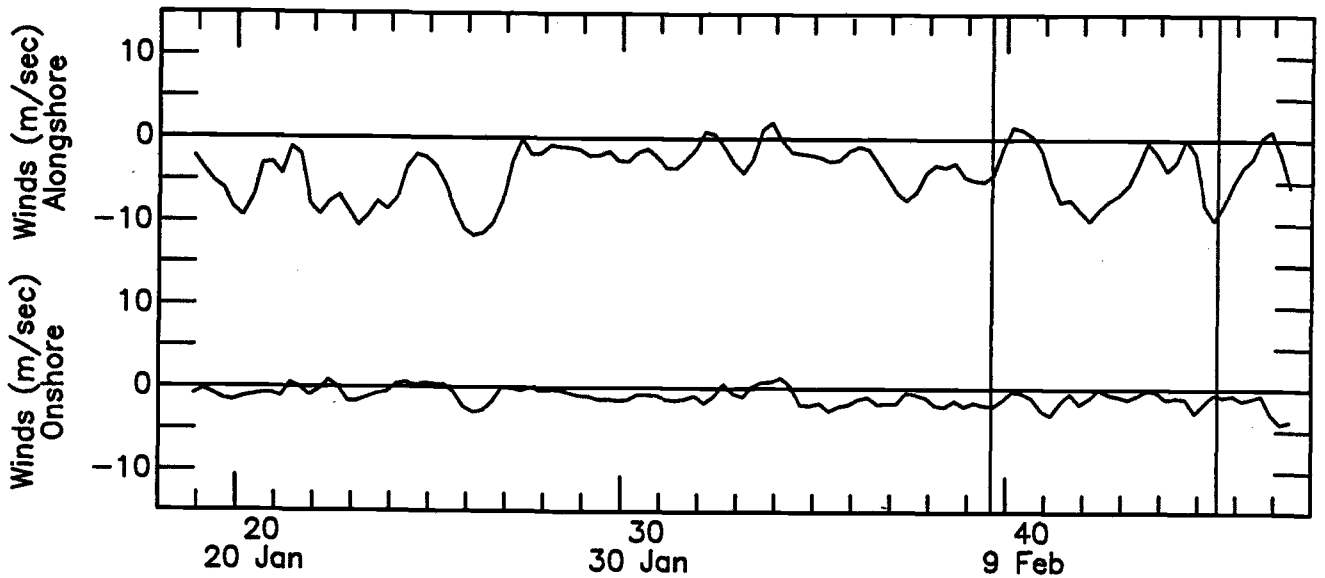


DRIFTER 12

DRIFTER	12		
TIME (days)	LAT (deg N)	LON (deg W)	SPEED (km/day)
39.82	34.44	120.74	
39.99	34.46	120.74	6.60
40.44	34.44	120.71	7.30
41.00	34.41	120.66	9.83
41.47	34.36	120.61	15.85
41.65	34.33	120.61	17.24
42.03	34.22	120.84	34.83
42.51	34.16	120.79	32.12
42.75	34.11	120.82	22.59
43.05	34.06	120.89	28.08
43.51	34.06	120.95	12.57
44.80	34.00	121.07	11.30
45.51	33.94	121.13	10.25



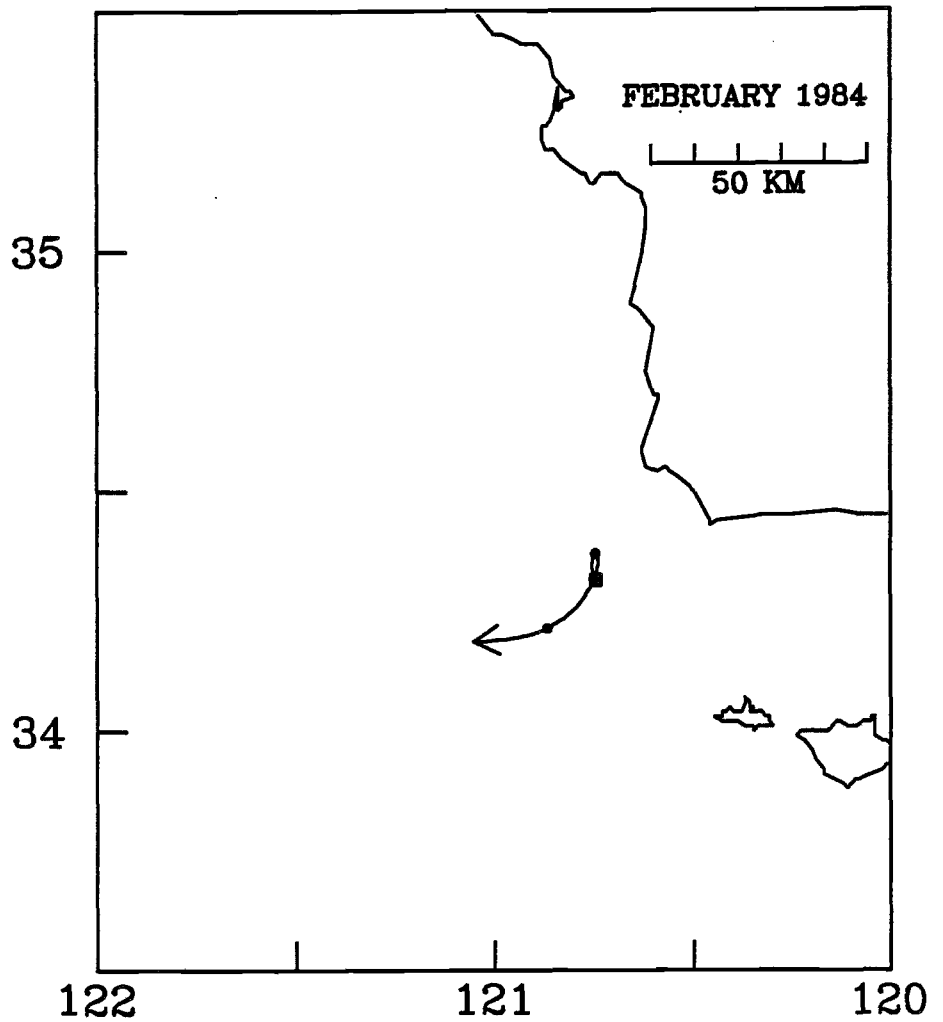
NDBC Buoy 46028



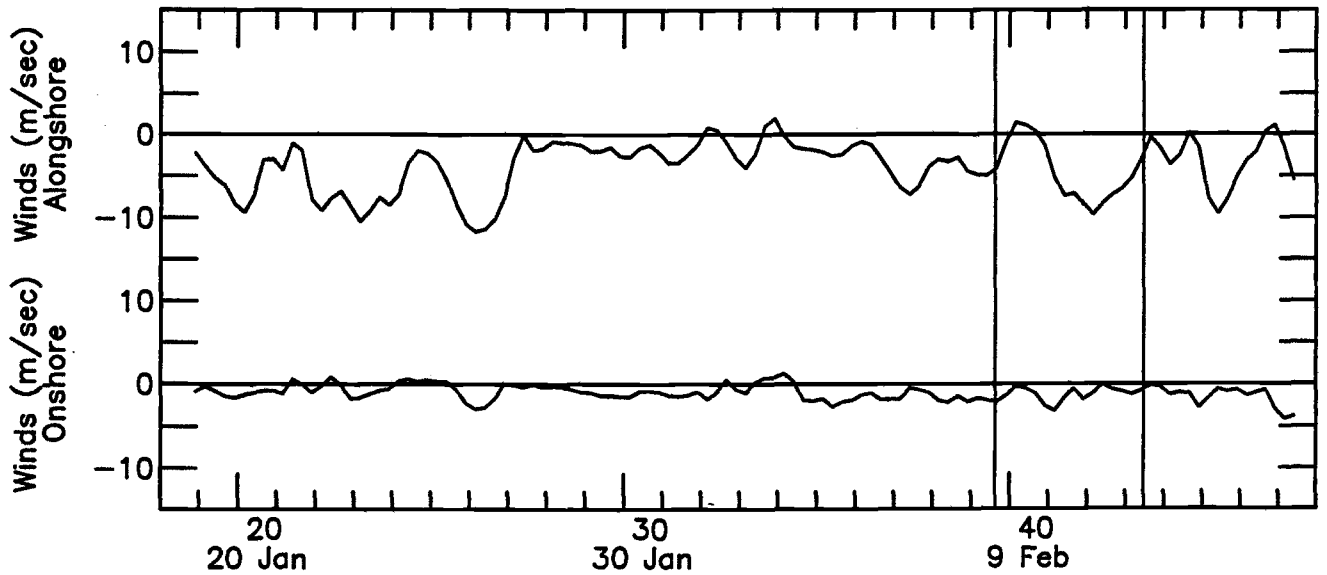
DRIFTER 13

DRIFTER 13

TIME (days)	LAT (deg N)	LON (deg W)	SPEED (km/day)
39.63	34.33	120.74	
40.00	34.33	120.76	3.82
40.44	34.37	120.77	11.21
41.01	34.38	120.71	10.32
41.47	34.31	120.75	18.46
41.85	34.31	120.77	10.15
42.00	34.24	120.79	20.38
42.46	34.22	120.88	19.31
42.71	34.22	120.89	3.31
43.02	34.18	120.96	25.49
43.47	34.19	121.07	21.86

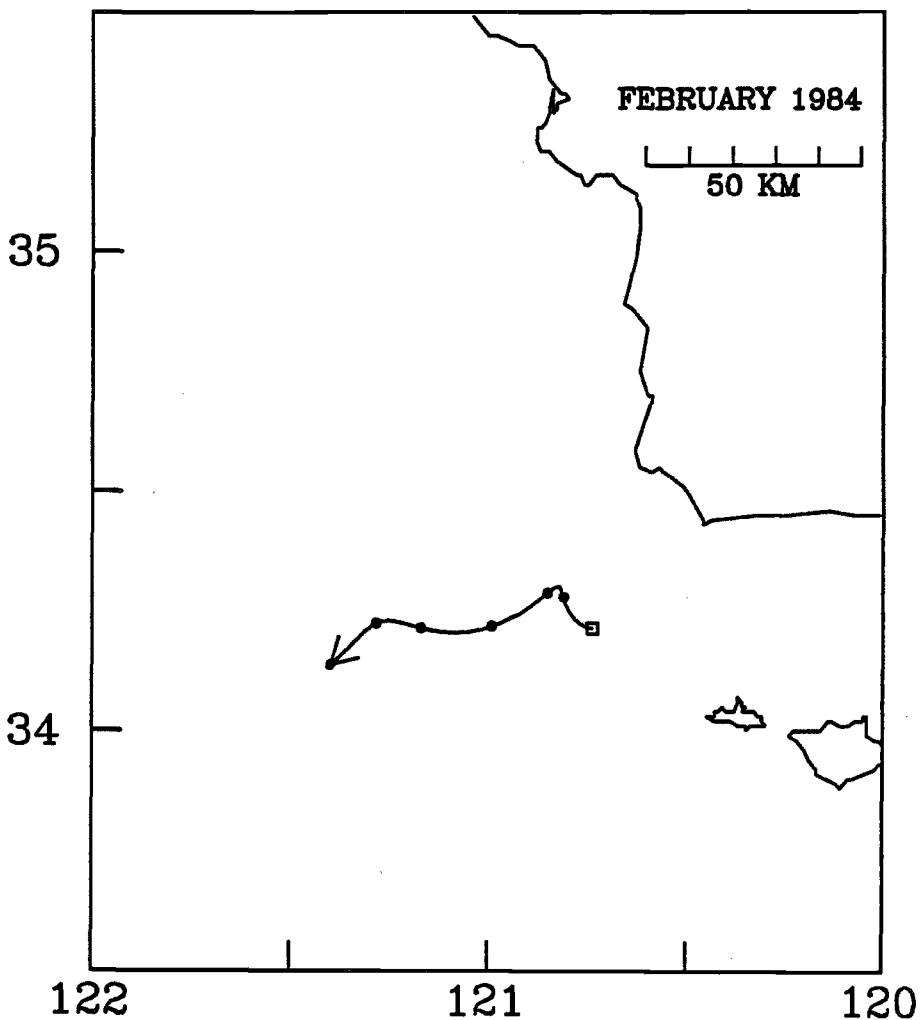


NDBC Buoy 46028

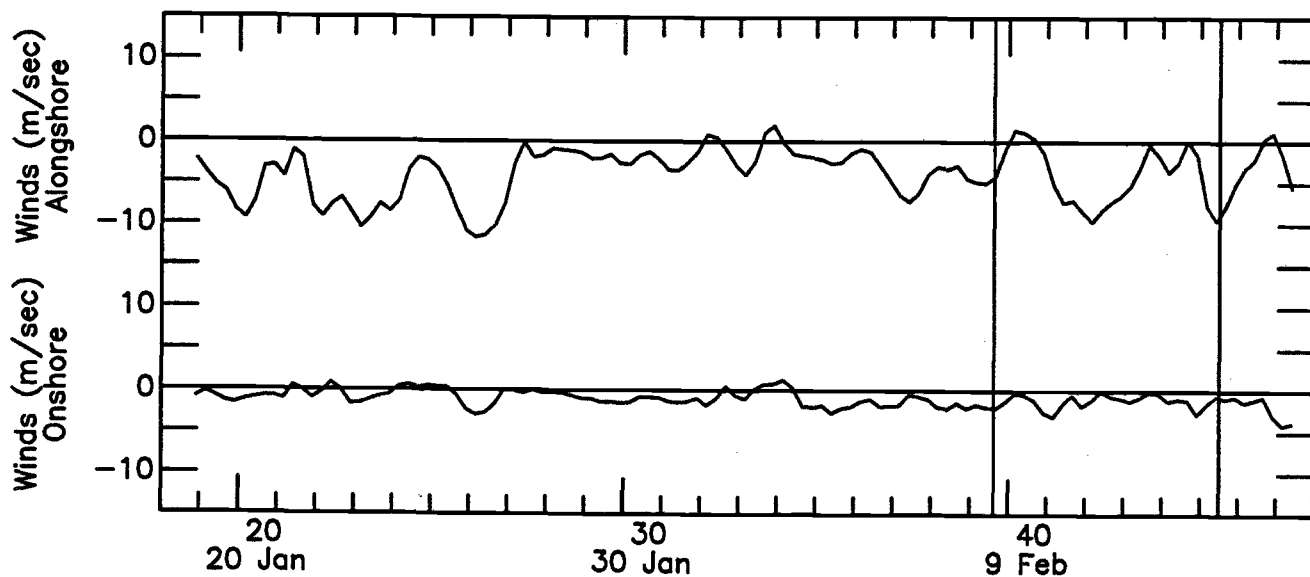


DRIFTER 14

TIME (days)	LAT (deg N)	LON (deg W)	SPEED (km/day)
39.63	34.22	120.74	
40.00	34.23	120.79	12.70
40.44	34.27	120.82	10.82
41.02	34.32	120.81	10.12
41.48	34.28	120.85	10.63
41.66	34.28	120.87	14.36
41.99	34.24	120.89	17.00
42.45	34.22	121.01	22.98
42.71	34.23	121.03	7.32
43.02	34.19	121.07	19.18
43.46	34.22	121.18	24.00
44.62	34.22	121.29	8.60
45.50	34.14	121.40	15.61



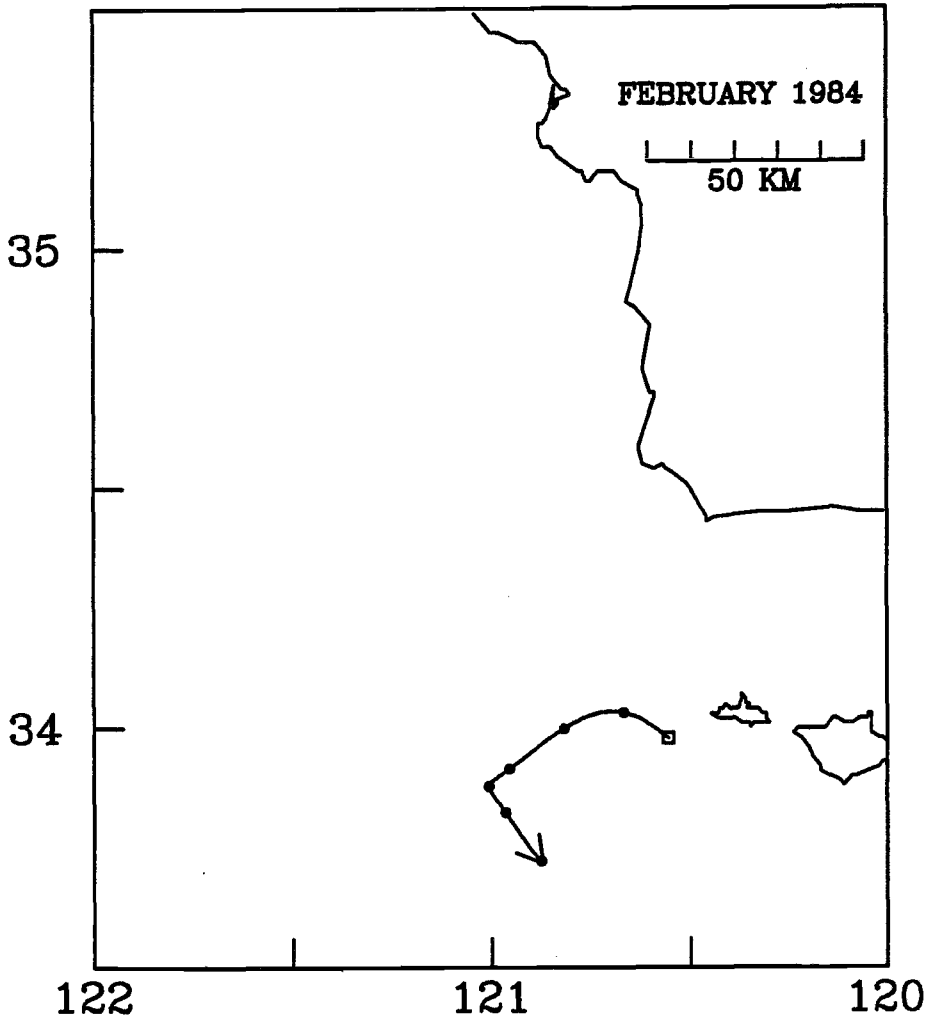
NDBC Buoy 46028



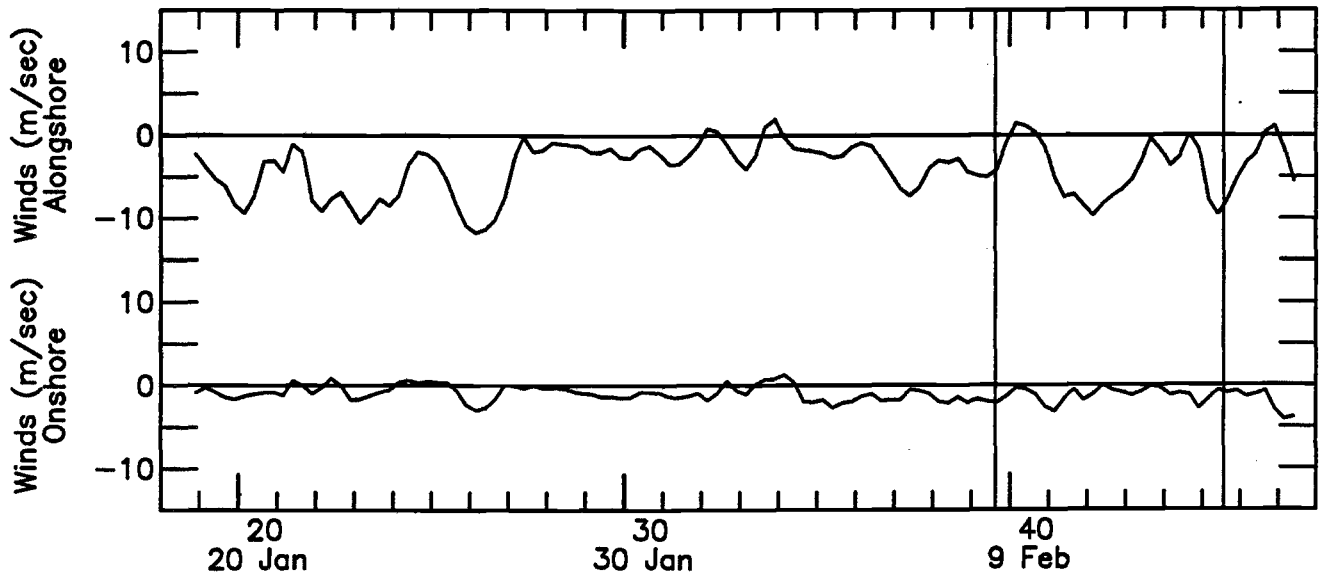
DRIFTER 15

DRIFTER 15

TIME (days)	LAT (deg N)	LON (deg W)	SPEED (km/day)
39.63	33.98	120.56	
40.01	34.01	120.60	14.12
40.45	34.02	120.67	14.26
41.02	34.04	120.74	10.94
41.49	33.99	120.82	20.47
41.67	33.99	120.85	15.11
42.01	33.95	120.87	14.52
42.47	33.92	120.97	20.06
42.72	33.91	120.98	7.13
43.03	33.88	121.00	12.13
43.48	33.89	121.00	2.12
44.58	33.81	120.97	7.75
45.56	33.72	120.87	14.24

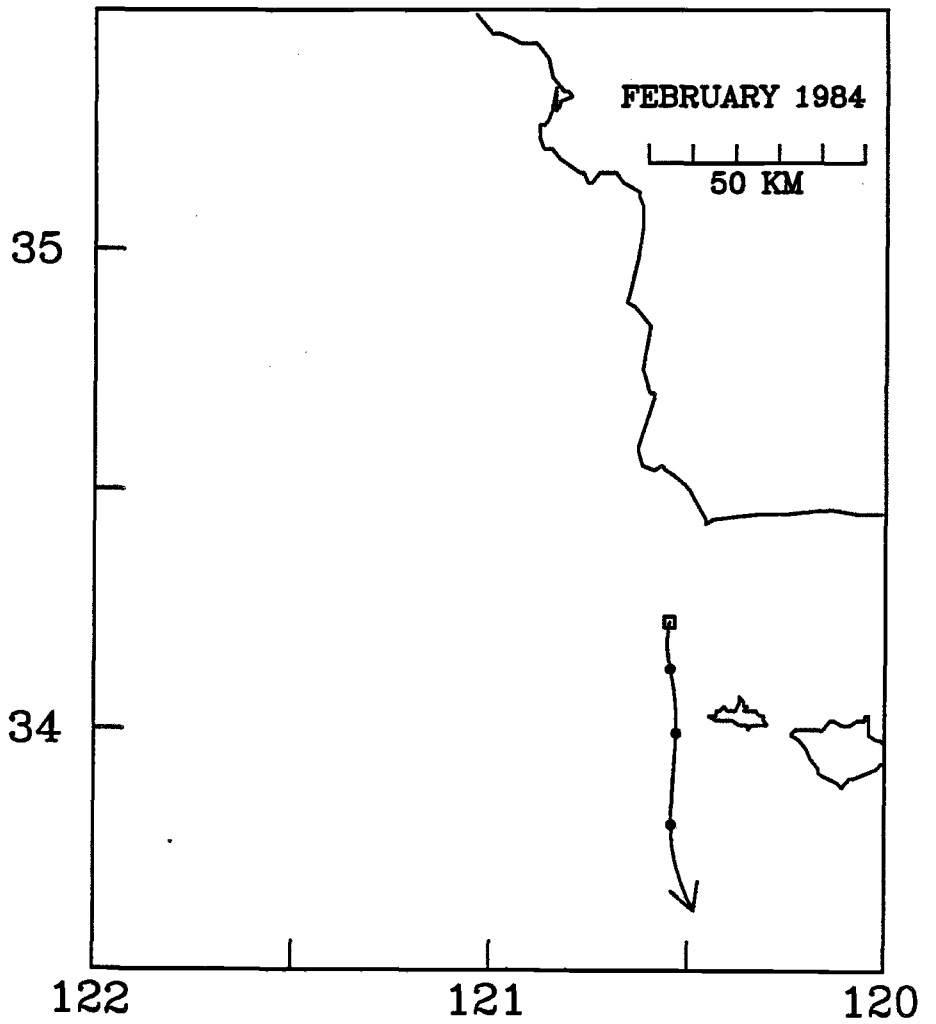


NDBC Buoy 46028

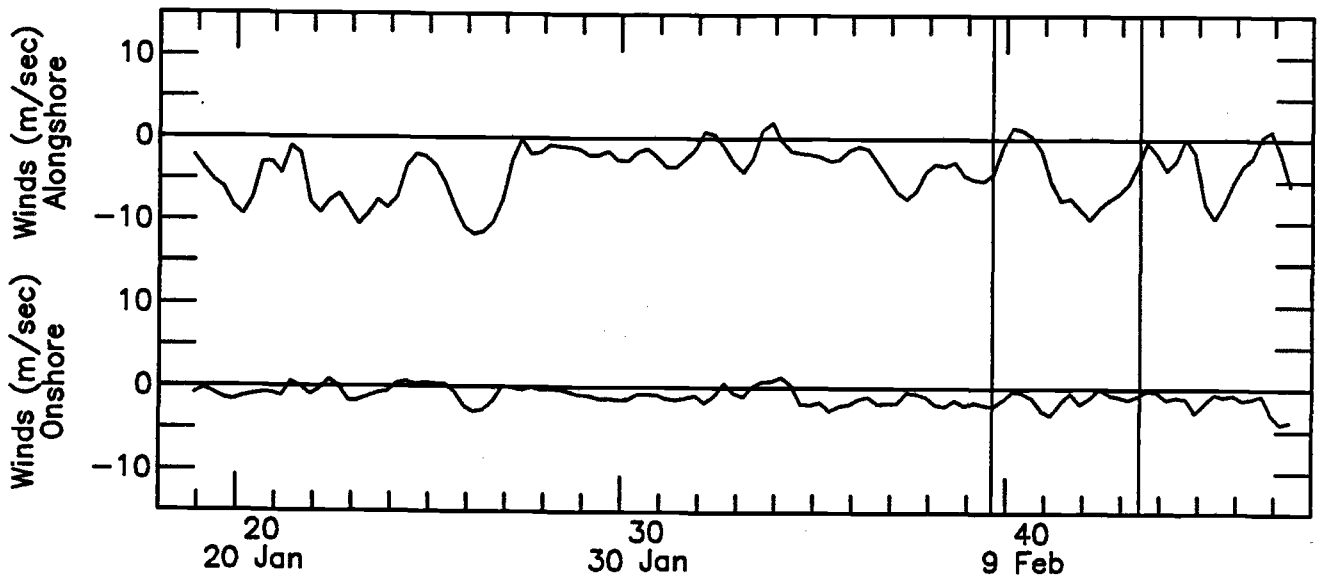


DRIFTER 16

TIME (days)	LAT (deg N)	LON (deg W)	SPEED (km/day)
39.84	34.23	120.55	
40.01	34.16	120.55	19.25
40.46	34.13	120.56	8.44
41.03	34.08	120.54	11.20
41.49	34.00	120.52	18.37
41.88	33.96	120.52	25.03
42.01	33.88	120.55	29.41
42.48	33.81	120.55	15.21
42.73	33.77	120.54	19.62
43.03	33.70	120.51	26.17
43.49	33.82	120.48	21.73



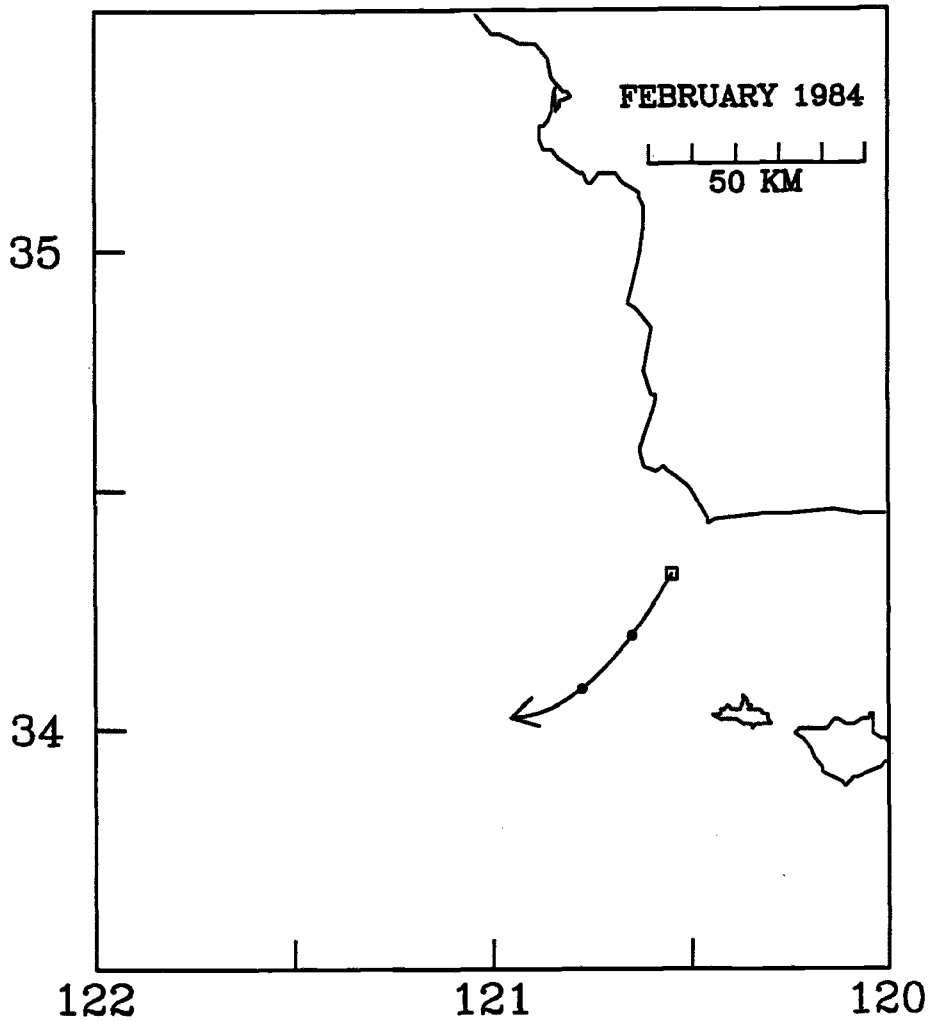
NDBC Buoy 46028



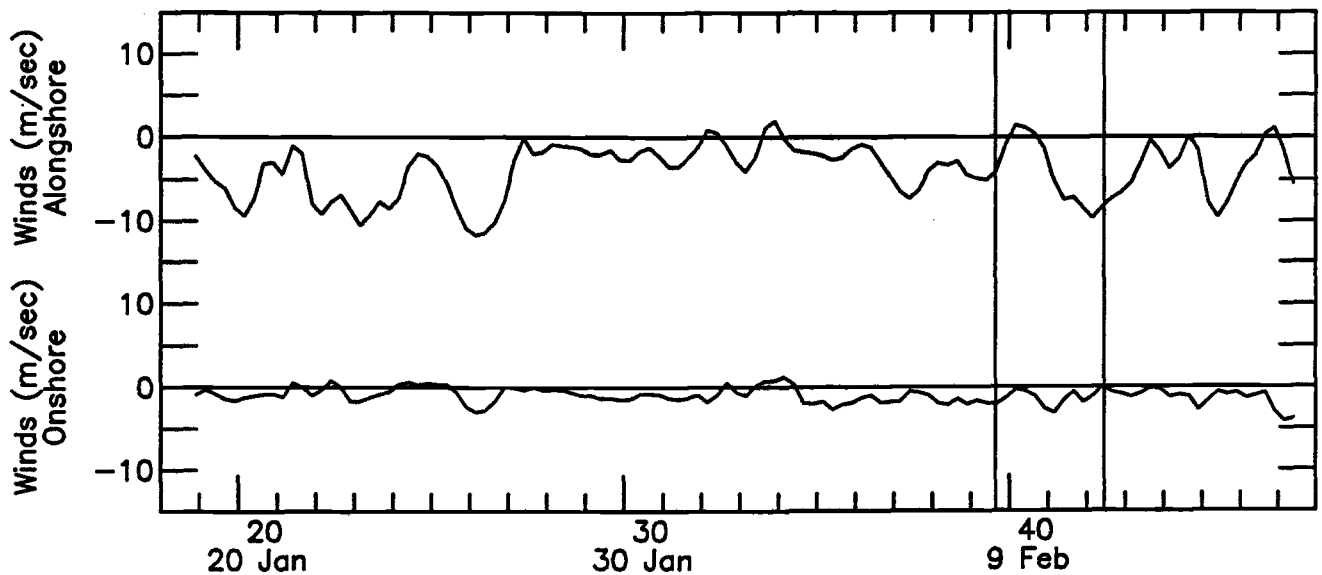
DRIFTER 17

DRIFTER 17

TIME (days)	LAT (deg N)	LON (deg W)	SPEED (km/day)
39.64	34.32	120.55	
40.02	34.25	120.61	24.50
40.47	34.20	120.65	15.24
41.03	34.15	120.70	14.07
41.50	34.08	120.79	22.95
41.67	34.07	120.80	10.75
42.00	34.04	120.86	17.60
42.46	34.02	120.96	20.86



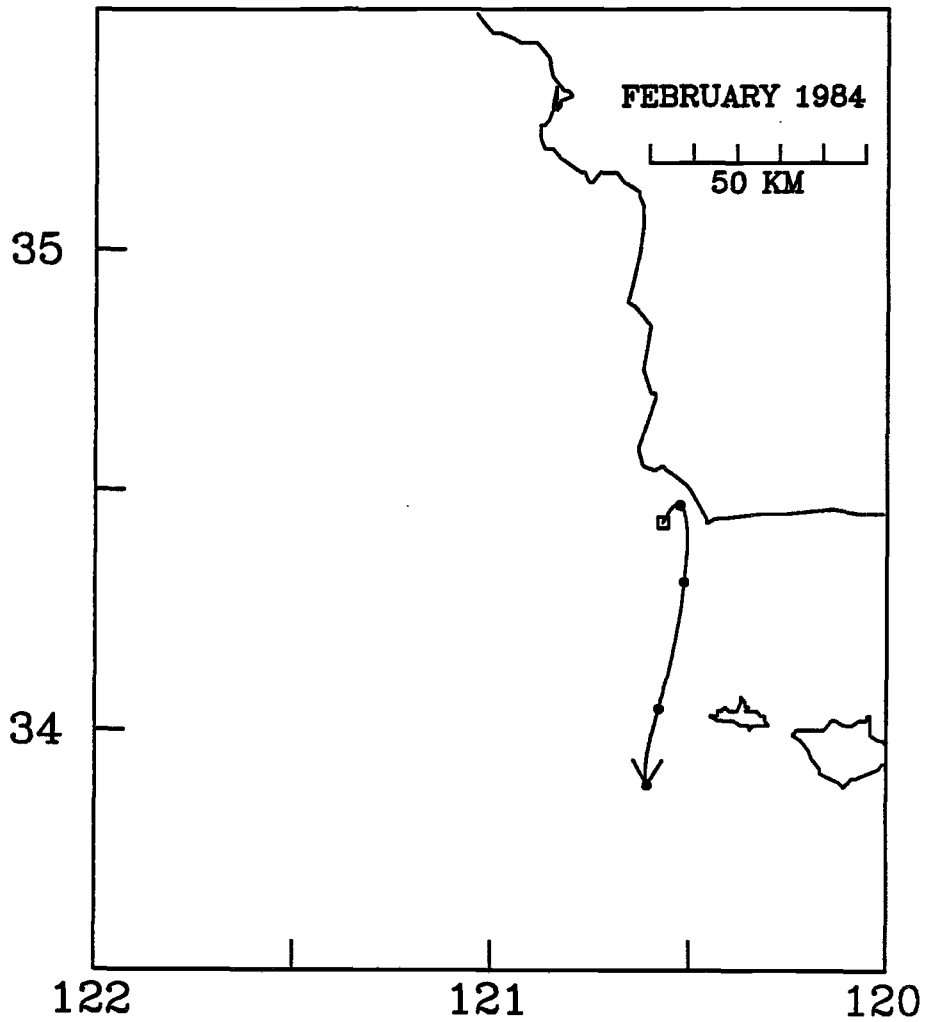
NDBC Buoy 46028



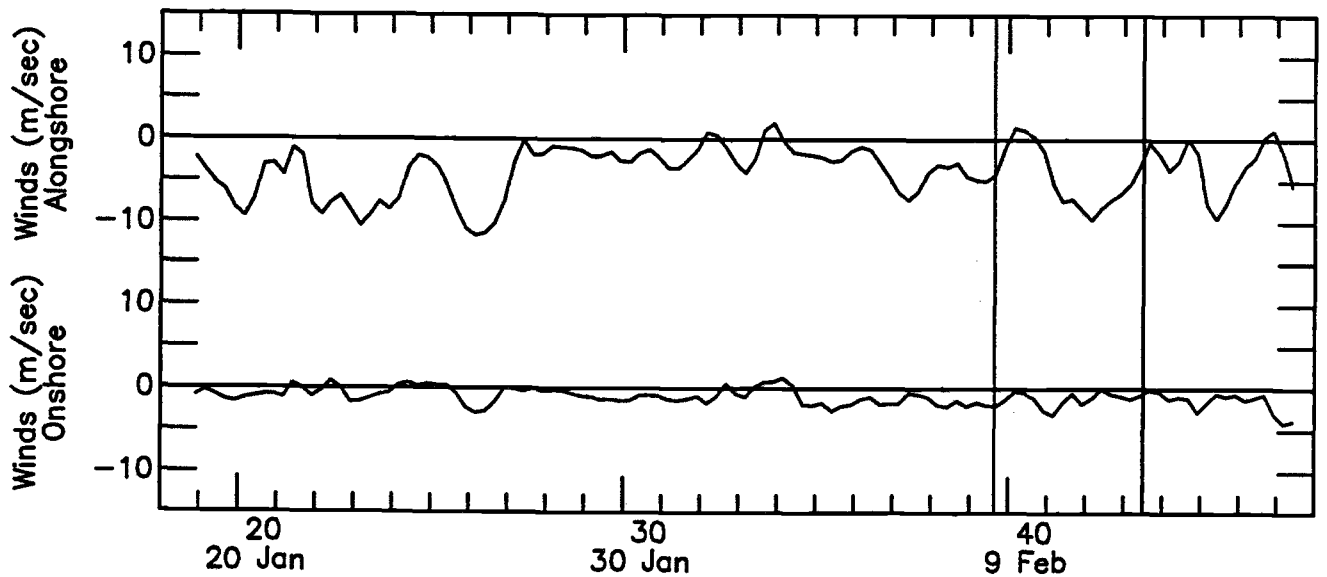
DRIFTER 18

DRIFTER 18

TIME (days)	LAT (deg N)	LON (deg W)	SPEED (km/day)
39.65	34.44	120.57	
40.02	34.44	120.55	4.07
40.48	34.47	120.53	7.76
41.04	34.43	120.53	7.35
41.51	34.32	120.48	28.26
41.89	34.25	120.52	45.08
42.03	34.12	120.56	43.30
42.50	34.06	120.61	18.72
42.74	34.02	120.59	19.70
43.05	33.94	120.58	27.77
43.50	33.88	120.62	15.75

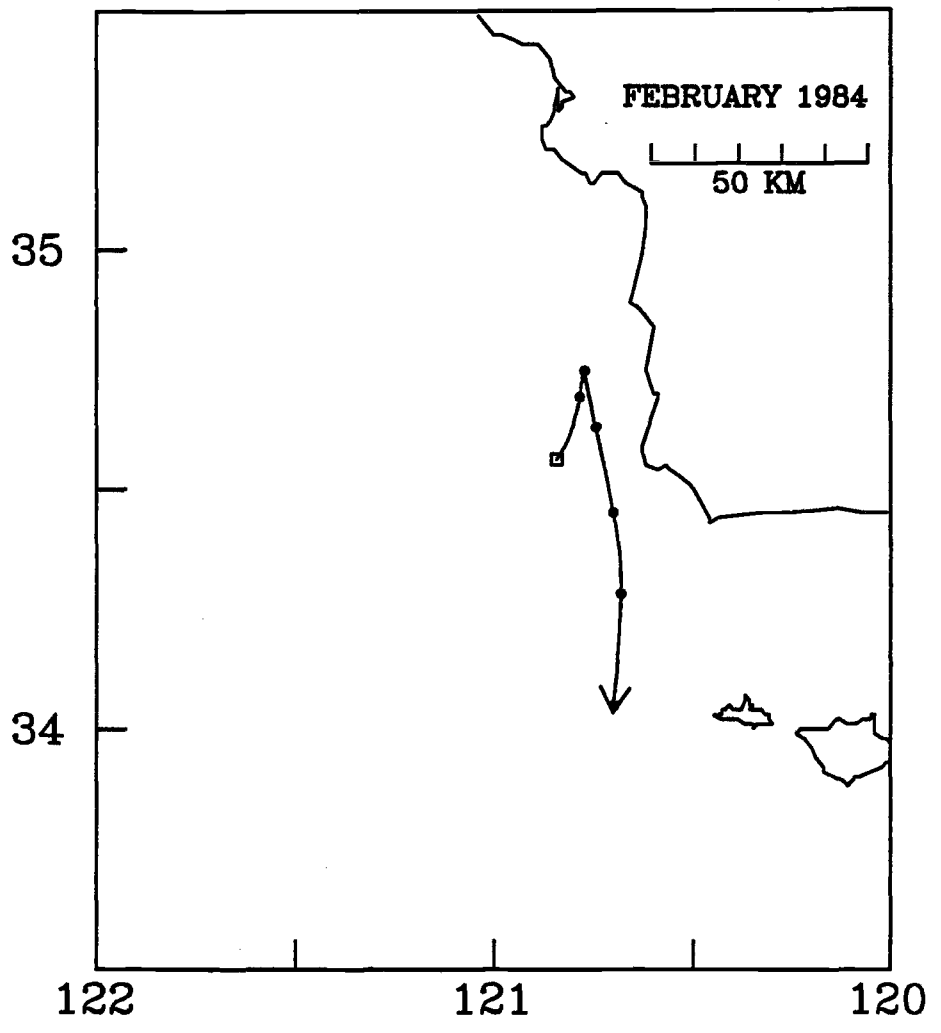


NDBC Buoy 46028

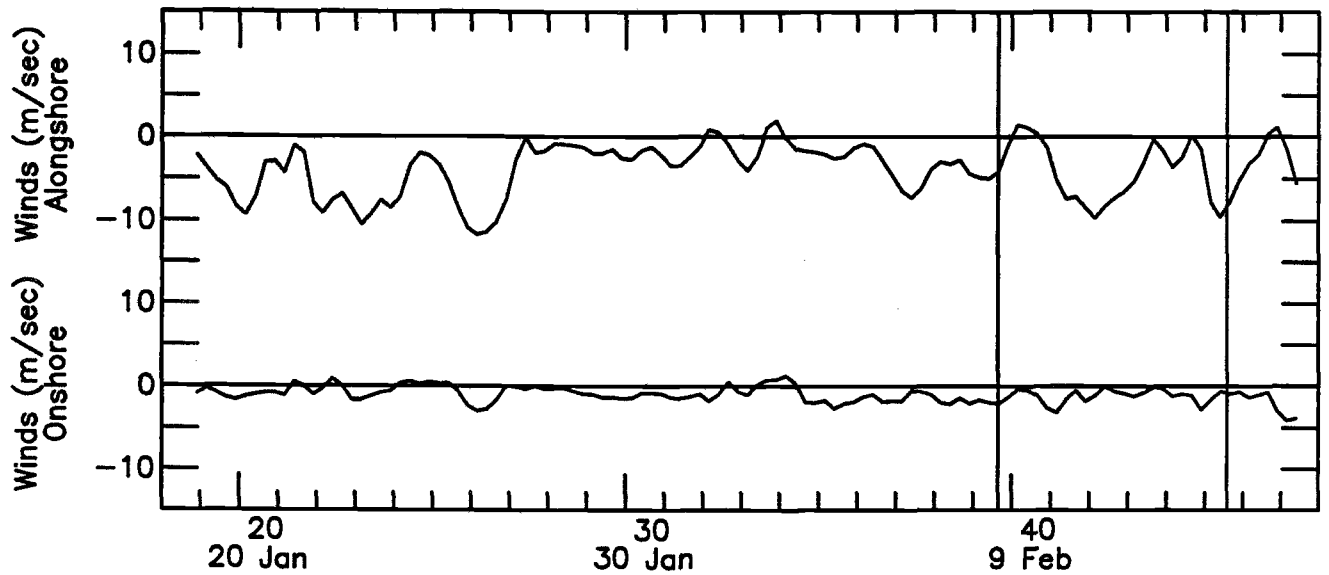


DRIFTER 19

DRIFTER 19			
TIME (days)	LAT (deg N)	LON (deg W)	SPEED (km/day)
39.66	34.57	120.85	
39.99	34.61	120.80	18.97
40.73	34.73	120.78	17.58
40.99	34.75	120.79	11.66
41.45	34.75	120.77	3.32
41.63	34.75	120.77	1.87
42.05	34.69	120.76	14.30
42.53	34.63	120.75	13.63
42.76	34.60	120.72	20.82
43.07	34.51	120.72	32.23
43.54	34.45	120.71	14.82
44.51	34.28	120.68	19.34
45.59	34.02	120.71	28.61



NDBC Buoy 46028



CRUISE 8403, JULY 1984

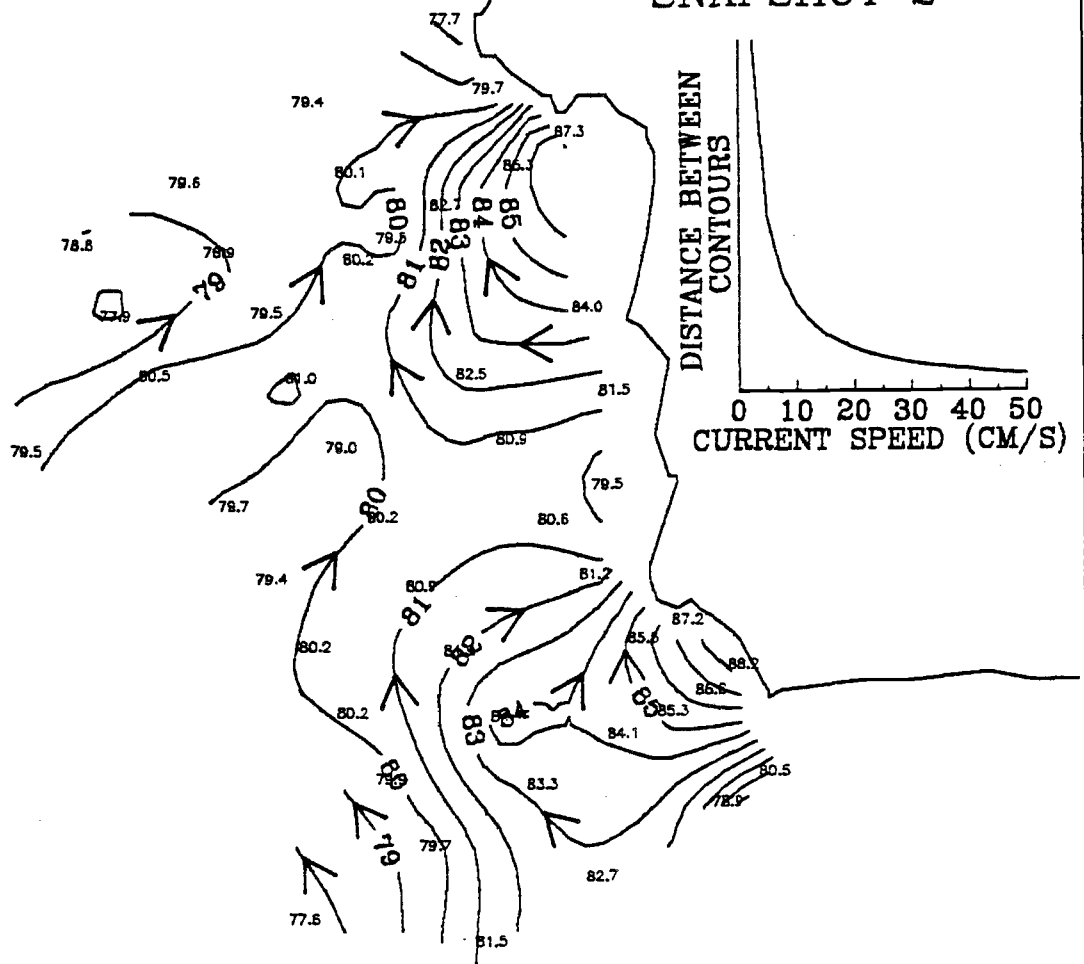
DYNAMIC HEIGHT (DYN CM)

0/500 M

JULY 1984

SNAPSHOT 2

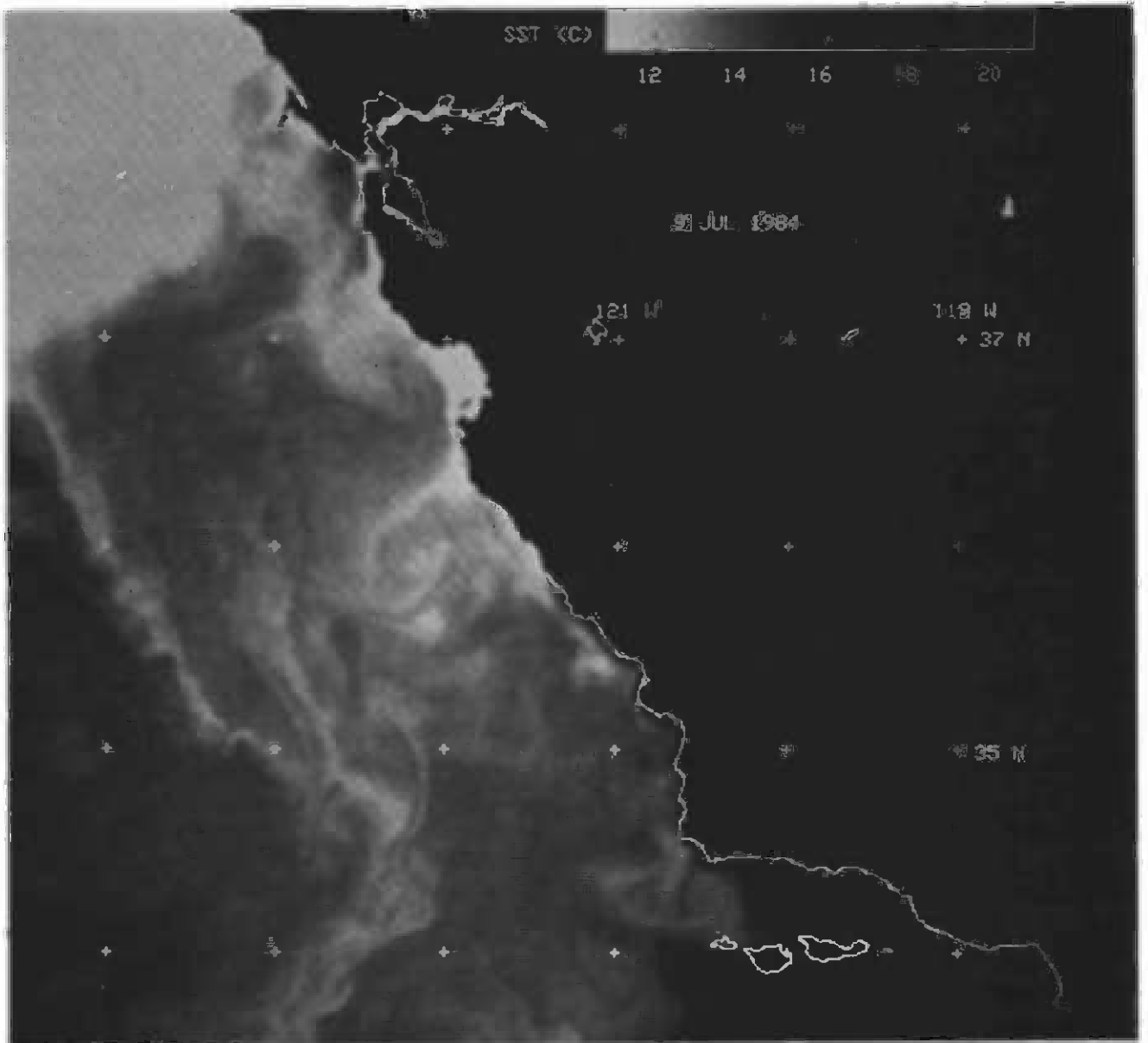
35



34

121

120



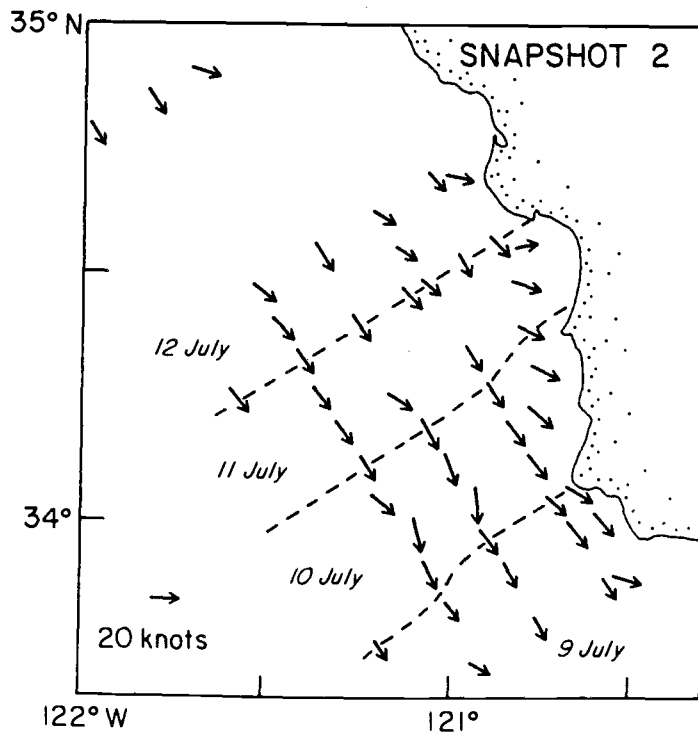
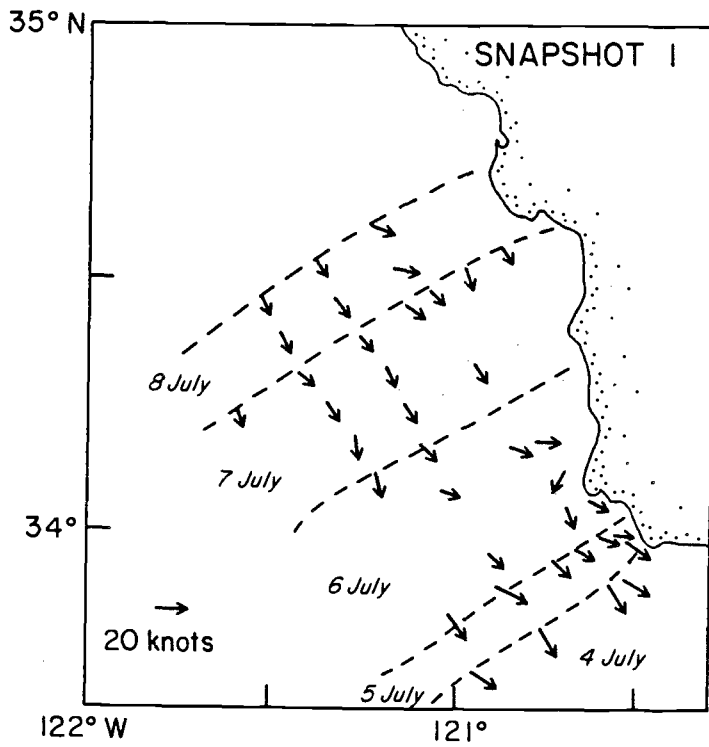


Table 2

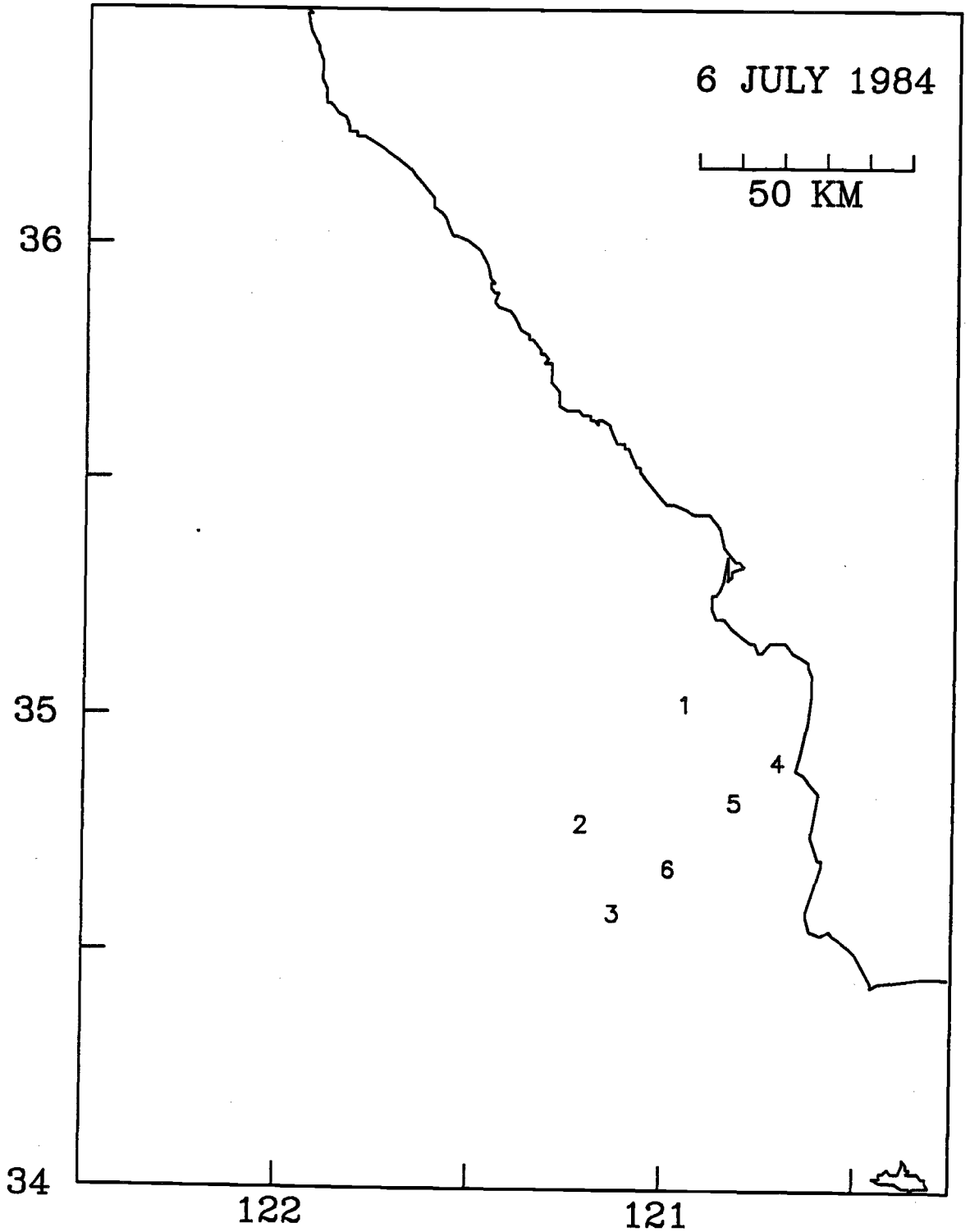
CRUISE 8403 - JULY 1984

DRIFTER NUMBER	NUMBER OBS	RELEASE LAT	RELEASE LON	RELEASE TIME	LAST OBS TIME
	2	35.13	120.84	188.74 (6 July)	189.39 (7 July)
1	35	35.01	120.97	188.75 (6 July)	202.40 (20 July)
	6	34.89	121.11	188.75 (6 July)	190.80 (8 July)
2	35	34.76	121.23	188.75 (6 July)	202.34 (20 July)
3	35	34.57	121.15	188.76 (6 July)	202.43 (20 July)
4	34	34.89	120.73	188.77 (6 July)	201.61 (19 July)
5	35	34.80	120.84	188.77 (6 July)	202.38 (20 July)
6	35	34.66	121.01	188.76 (6 July)	202.46 (20 July)
7	19	35.13	120.84	194.64 (12 July)	202.38 (20 July)
8	7	35.08	120.89	194.64 (12 July)	196.59 (14 July)
9	19	34.76	121.25	194.66 (12 July)	202.42 (20 July)
10	19	34.54	121.06	194.70 (12 July)	202.53 (20 July)
11	19	34.52	120.84	194.71 (12 July)	202.51 (20 July)
12	18	34.54	120.67	194.71 (12 July)	200.42 (18 July)
13	19	34.81	120.84	194.72 (12 July)	202.36 (20 July)
14	19	34.94	120.71	194.73 (12 July)	202.35 (20 July)
15	9	34.73	120.78	197.83 (15 July)	202.33 (20 July)
16	7	34.41	120.83	197.77 (15 July)	199.82 (17 July)
17	10	34.46	120.73	197.81 (15 July)	202.33 (20 July)
18	10	34.47	120.66	197.81 (15 July)	202.56 (20 July)
	3	34.51	120.57	197.82 (15 July)	198.67 (16 July)

CRUISE 8403 DRIFTERS 1 - 6

6 JULY 1984

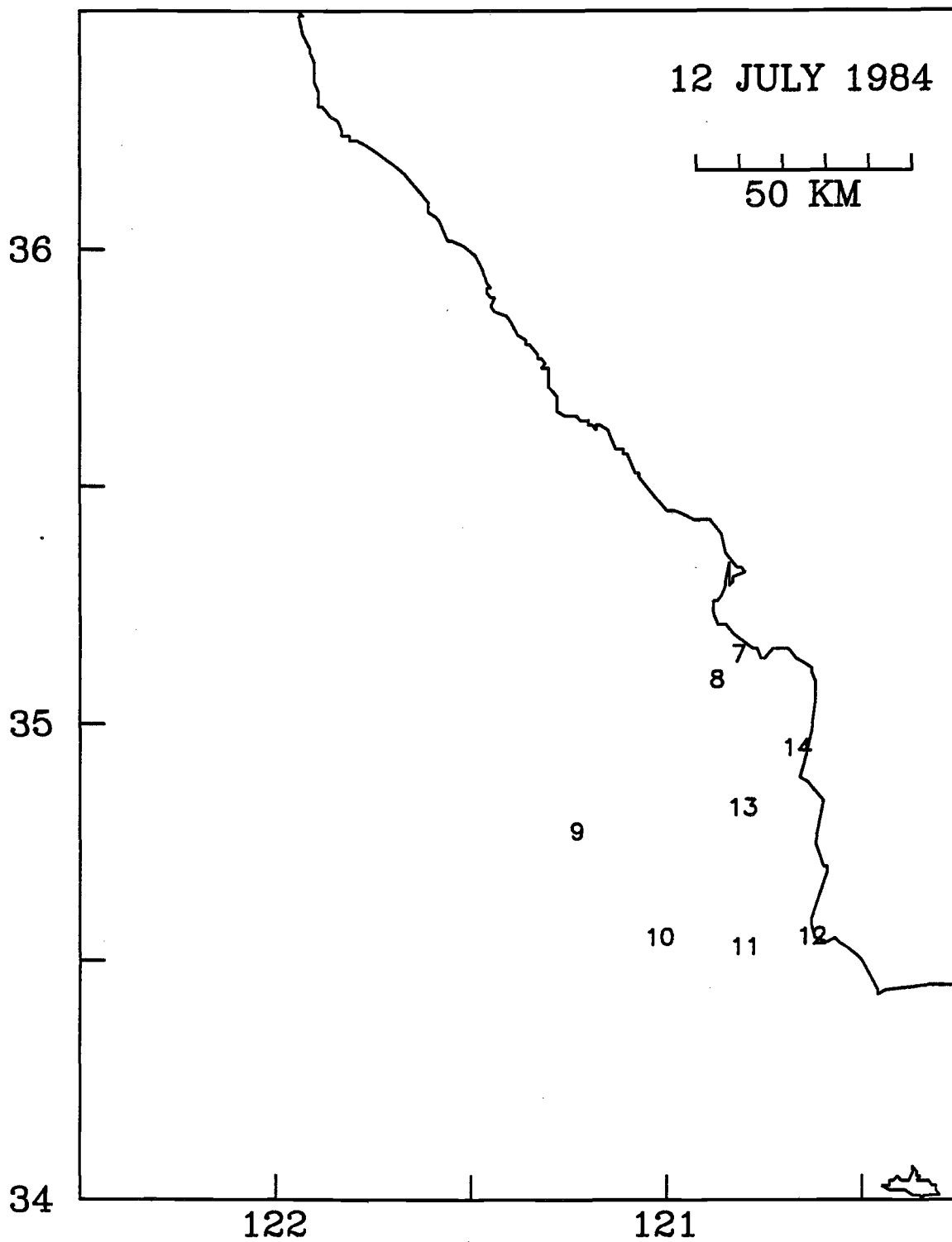
50 KM



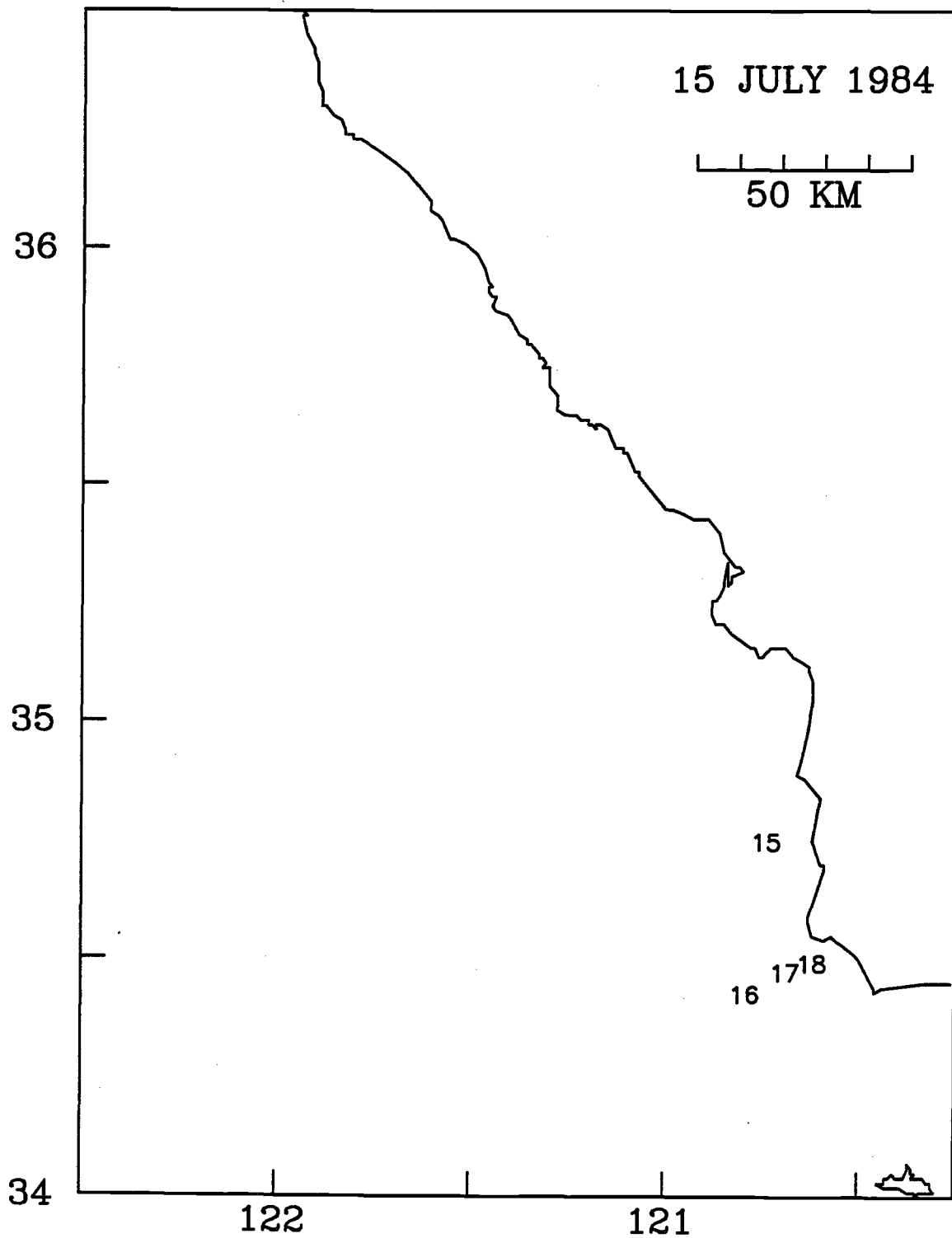
CRUISE 8403 DRIFTERS 7 - 14

12 JULY 1984

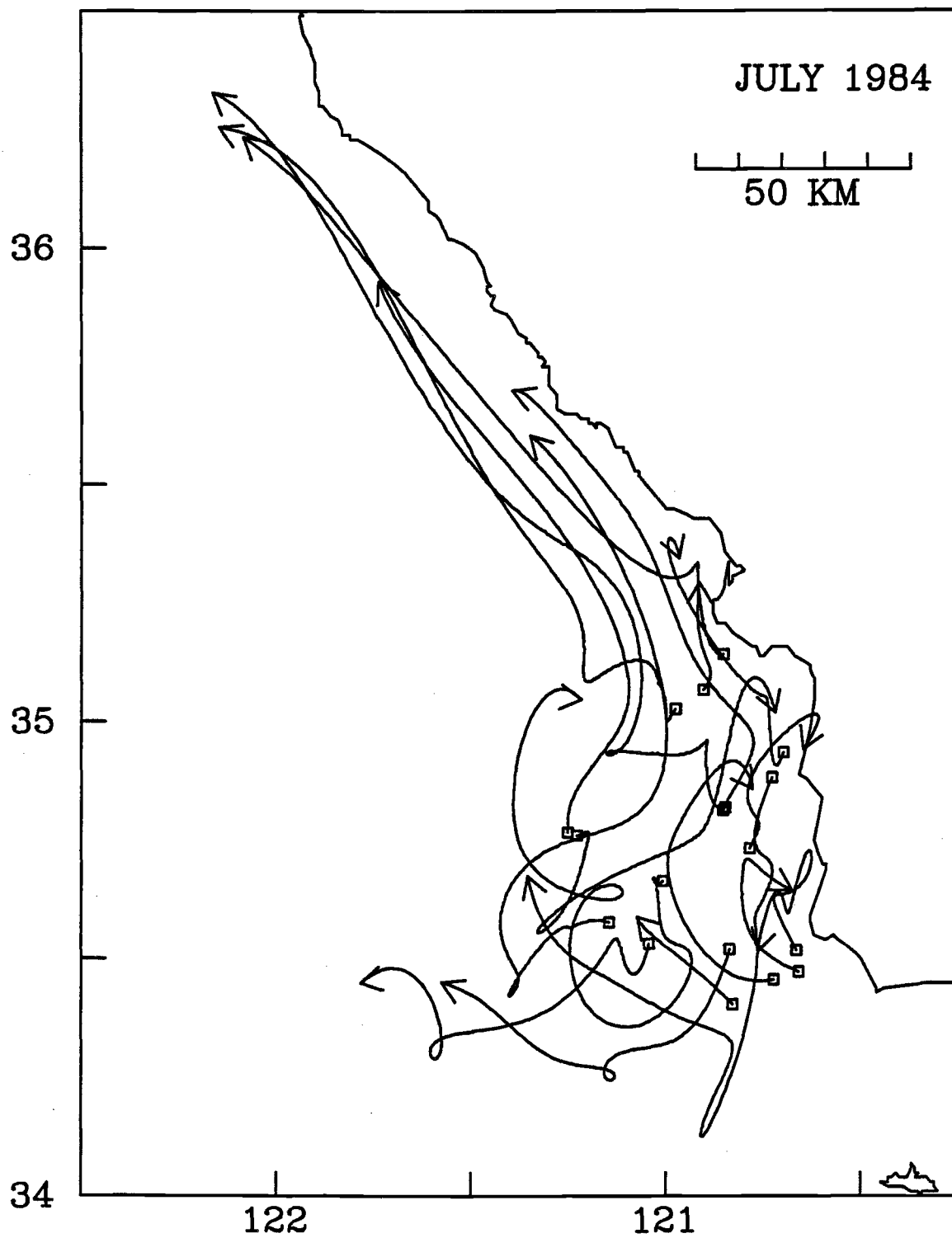
50 KM



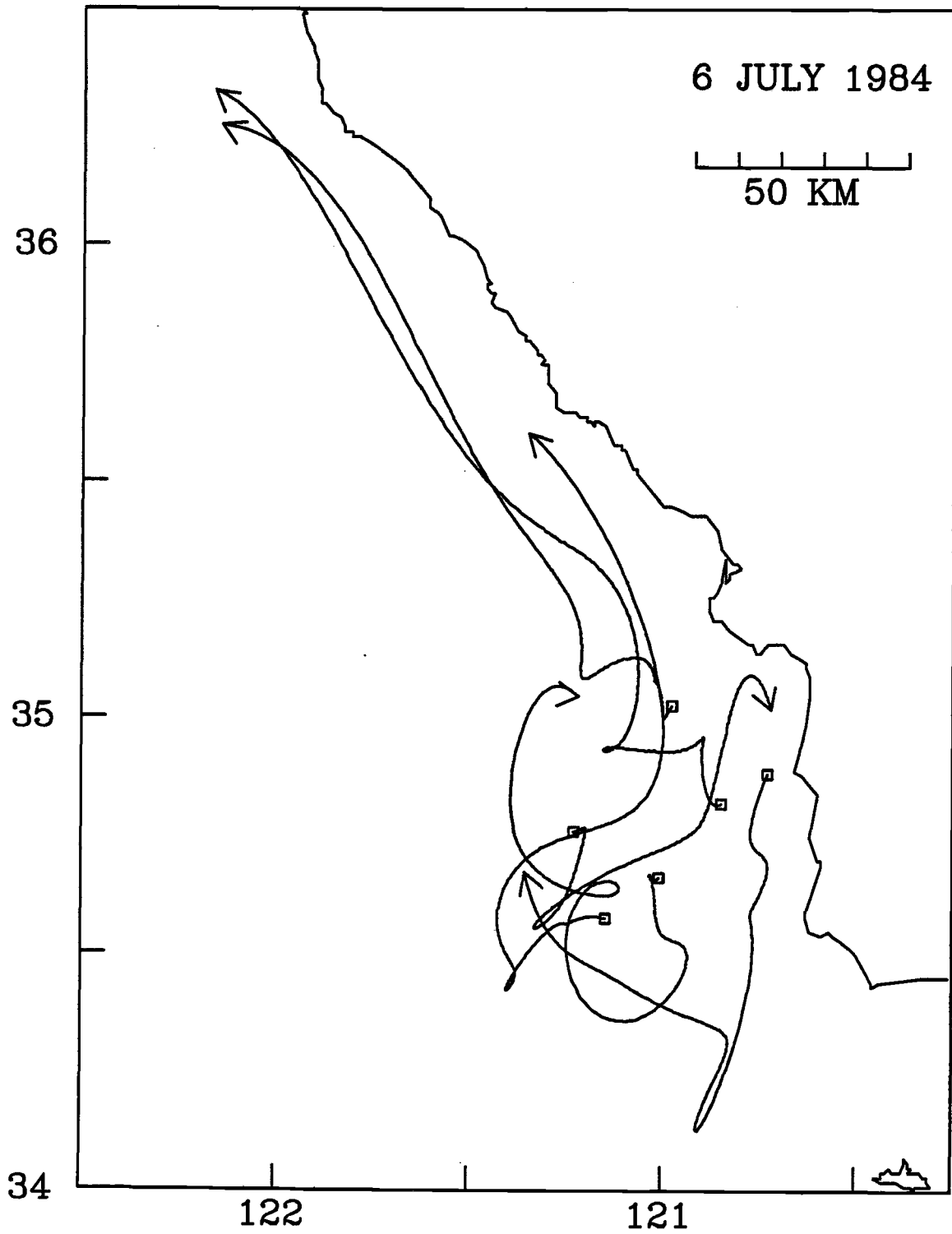
CRUISE 8403 DRIFTERS 15 - 18



CRUISE 8403 DRIFTERS 1 - 18

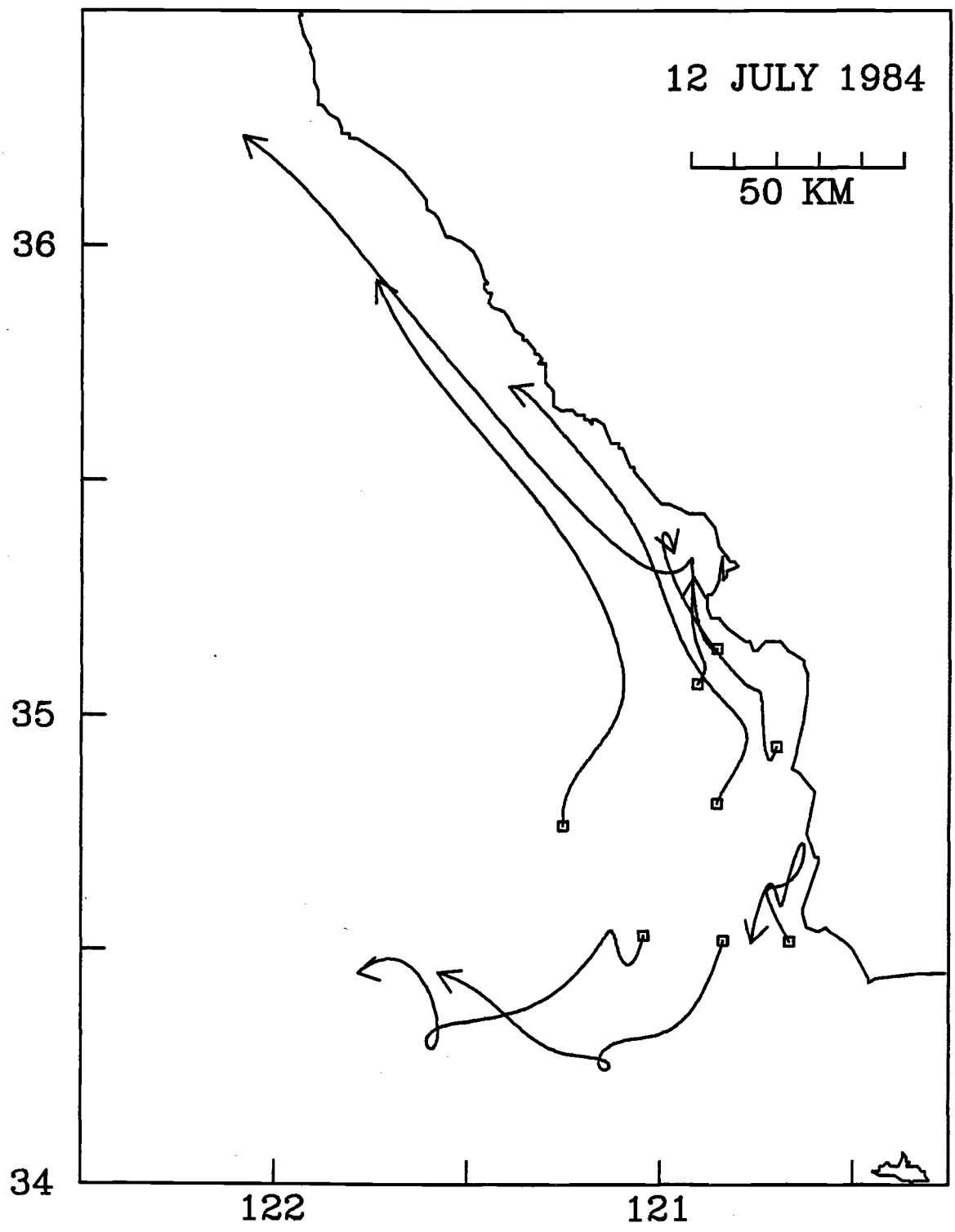
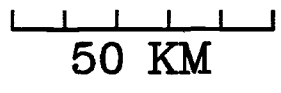


CRUISE 8403 DRIFTERS 1 - 6

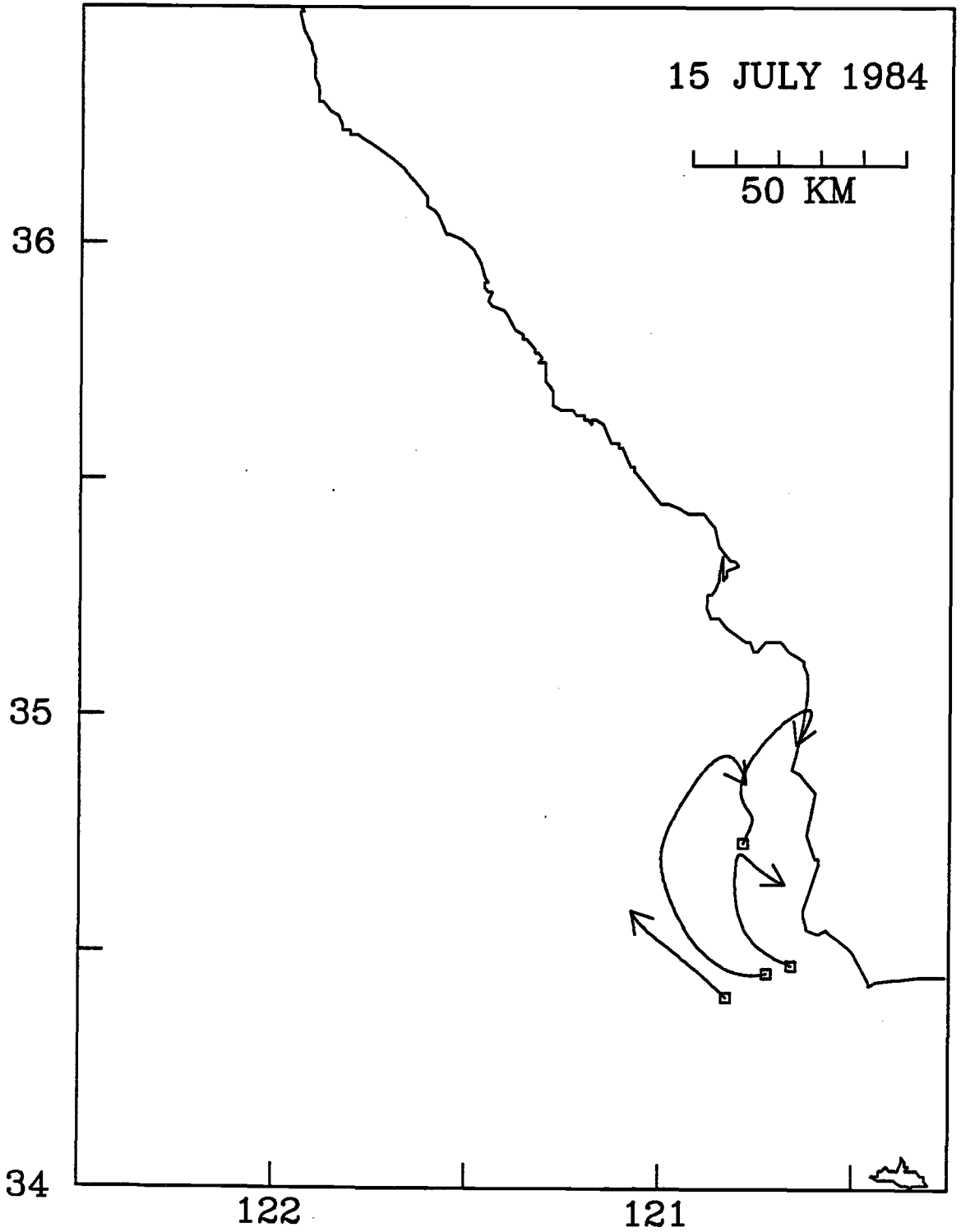


CRUISE 8403 DRIFTERS 7 - 14

12 JULY 1984



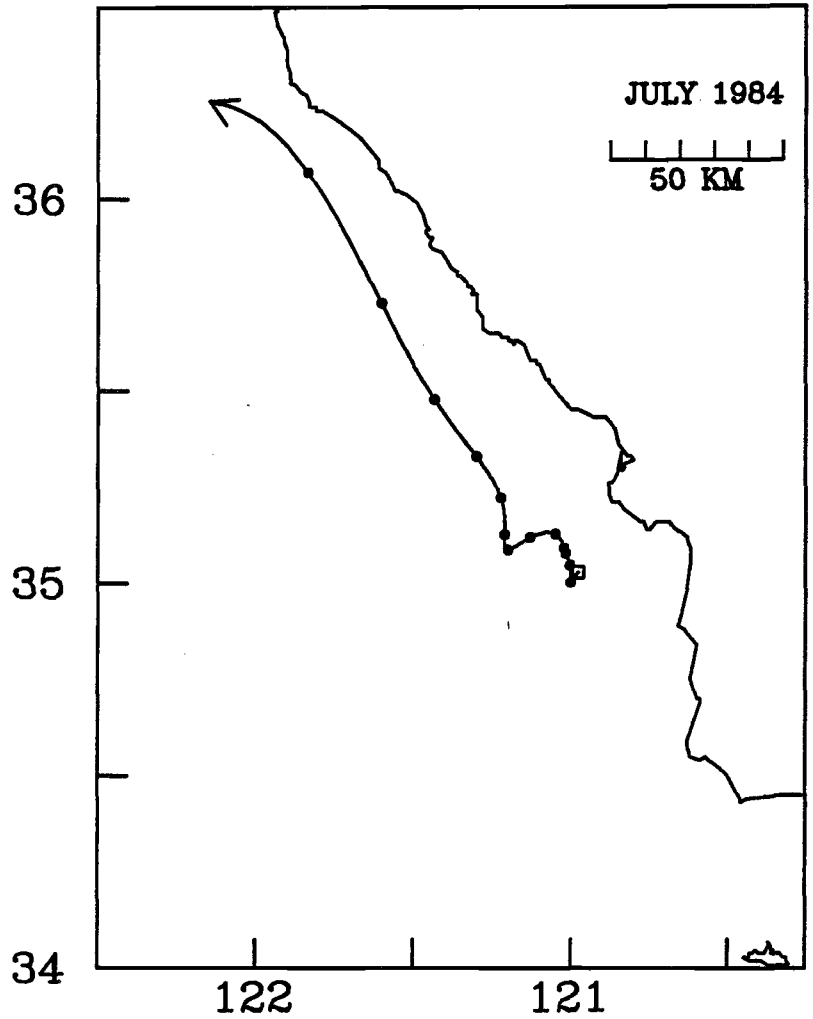
CRUISE 8403 DRIFTERS 15 - 18



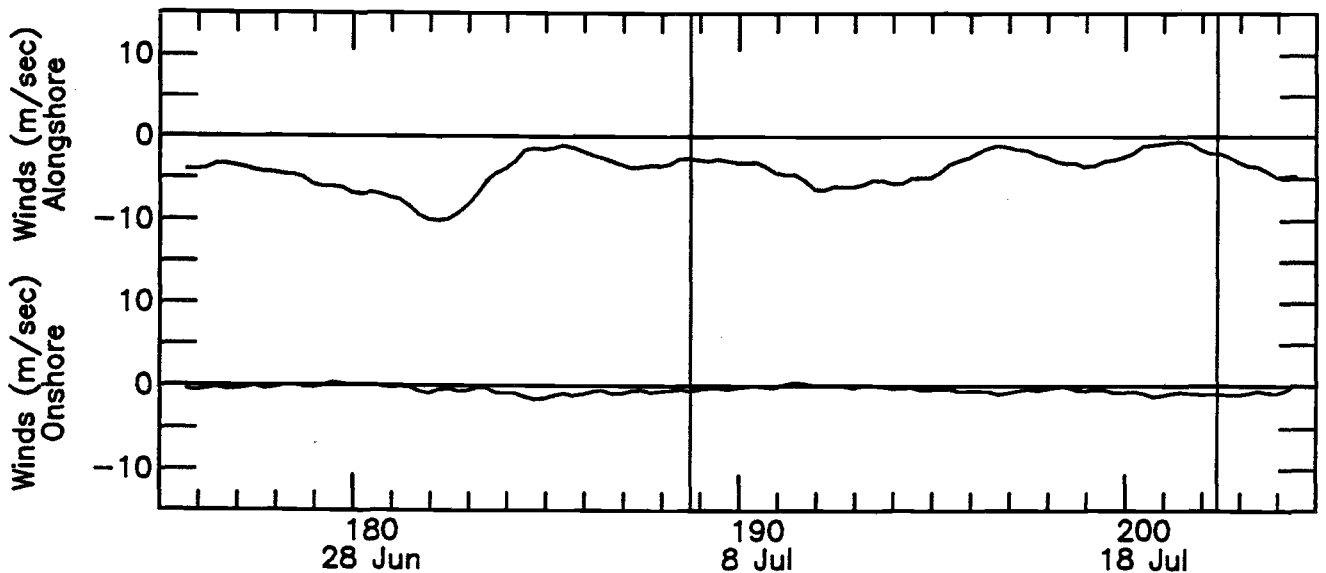
DRIFTER 1

DRIFTER 1

TIME (days)	LAT (deg N)	LON (deg W)	SPEED (km/day)
188.75	35.01	120.97	
189.40	34.99	120.99	5.08
189.71	34.99	120.97	4.77
190.32	35.01	121.00	5.57
190.54	35.03	120.99	9.45
190.79	35.04	120.97	9.41
191.33	35.06	121.00	6.53
191.59	35.07	120.99	6.42
191.80	35.05	120.99	10.22
192.30	35.06	121.04	8.80
192.56	35.08	121.00	14.06
192.80	35.08	120.99	6.36
193.31	35.09	121.06	12.74
193.58	35.12	121.03	15.79
193.81	35.11	121.01	11.04
194.29	35.10	121.11	17.76
194.65	35.10	121.14	7.80
194.80	35.09	121.15	9.54
195.30	35.08	121.19	8.20
195.56	35.07	121.21	6.62
195.79	35.08	121.18	12.08
196.29	35.10	121.21	6.86
196.60	35.12	121.22	6.65
196.80	35.16	121.19	26.66
197.31	35.22	121.23	13.98
197.72	35.23	121.24	4.91
198.38	35.33	121.30	18.59
198.60	35.35	121.31	11.49
198.80	35.36	121.35	17.70
199.32	35.46	121.42	24.26
199.56	35.50	121.44	23.32
199.76	35.56	121.47	31.76
200.33	35.68	121.60	31.04
201.57	36.10	121.85	42.47
202.40	36.26	122.16	38.66



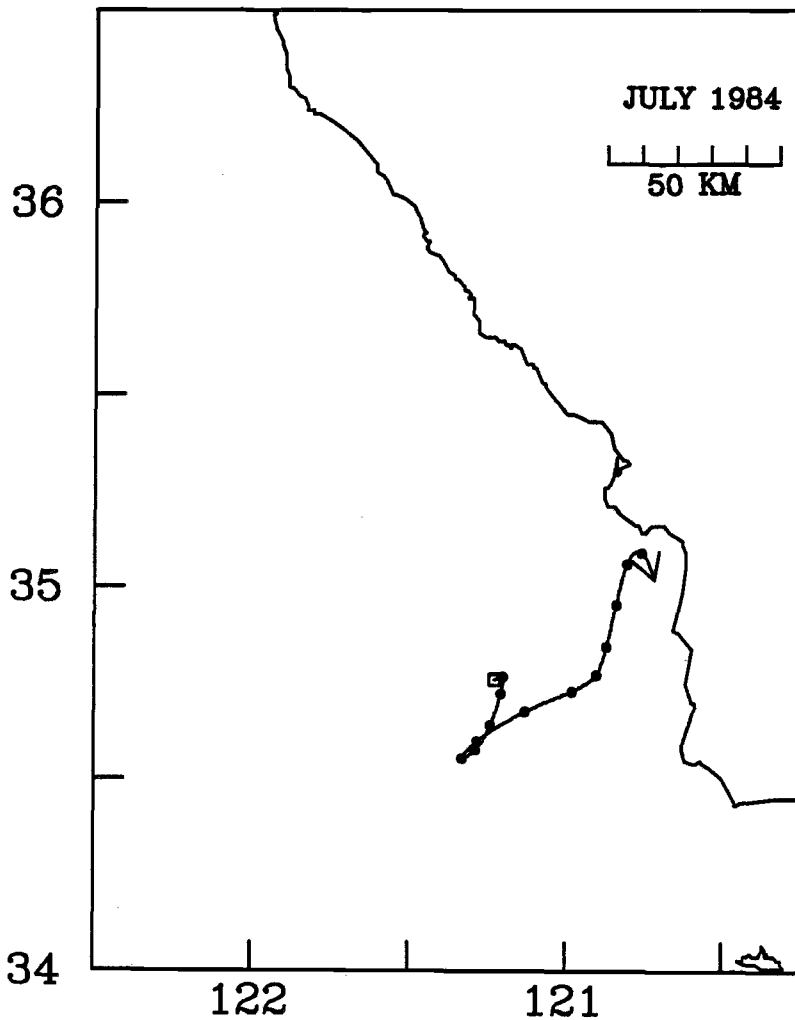
NDBC Buoy 46011



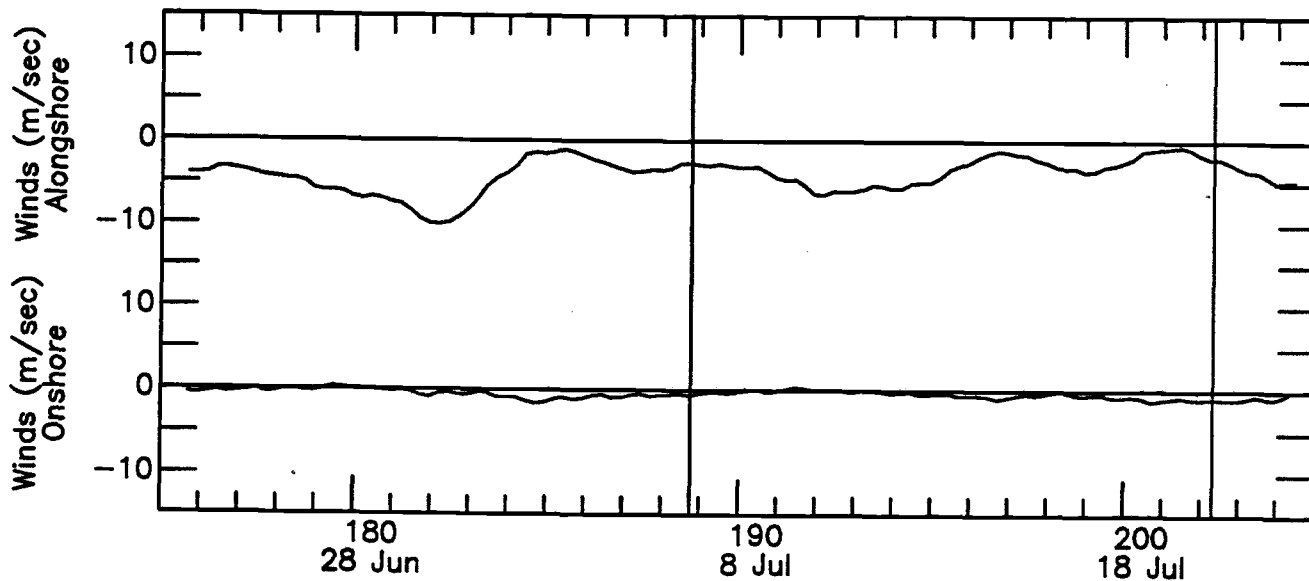
DRIFTER 2

DRIFTER 2

TIME (days)	LAT (deg N)	LON (deg W)	SPEED (km/day)
188.75	34.76	121.23	
189.41	34.76	121.23	0.58
189.72	34.77	121.20	10.66
190.33	34.72	121.22	10.21
190.56	34.72	121.22	3.09
190.80	34.69	121.21	12.12
191.36	34.65	121.28	14.81
191.60	34.62	121.26	12.78
191.81	34.59	121.25	20.85
192.31	34.57	121.30	8.68
192.57	34.58	121.30	5.54
192.81	34.54	121.31	19.00
193.32	34.53	121.35	6.88
193.60	34.56	121.36	9.69
193.83	34.54	121.34	10.91
194.30	34.56	121.32	5.18
194.67	34.61	121.27	20.11
194.82	34.62	121.23	25.27
195.32	34.66	121.18	13.83
195.59	34.69	121.11	26.13
195.80	34.68	121.06	24.90
196.30	34.69	121.05	2.47
196.61	34.75	120.96	35.49
196.81	34.75	120.92	19.84
197.32	34.77	120.92	4.82
197.83	34.80	120.87	10.46
198.47	34.85	120.88	10.01
198.68	34.88	120.85	20.25
198.88	34.89	120.83	10.02
199.28	34.92	120.85	8.43
199.53	34.97	120.84	25.90
199.74	35.02	120.80	34.01
200.30	35.04	120.81	4.12
201.53	35.10	120.75	7.00
202.34	35.02	120.71	11.58



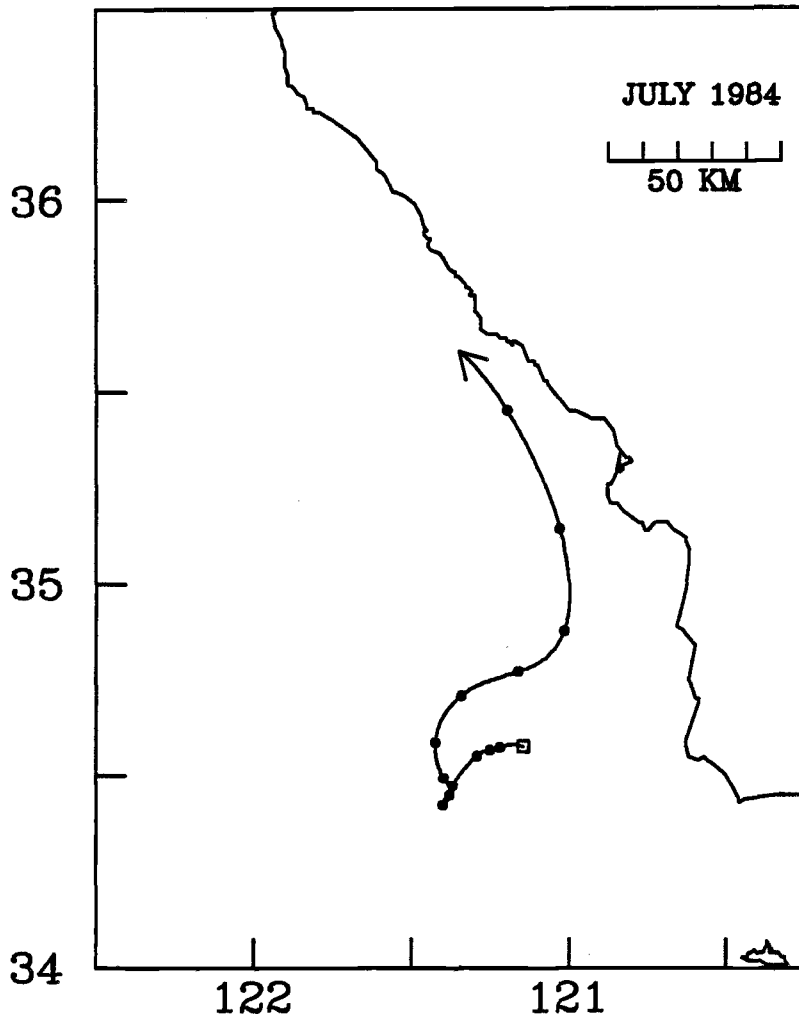
NDBC Buoy 46011



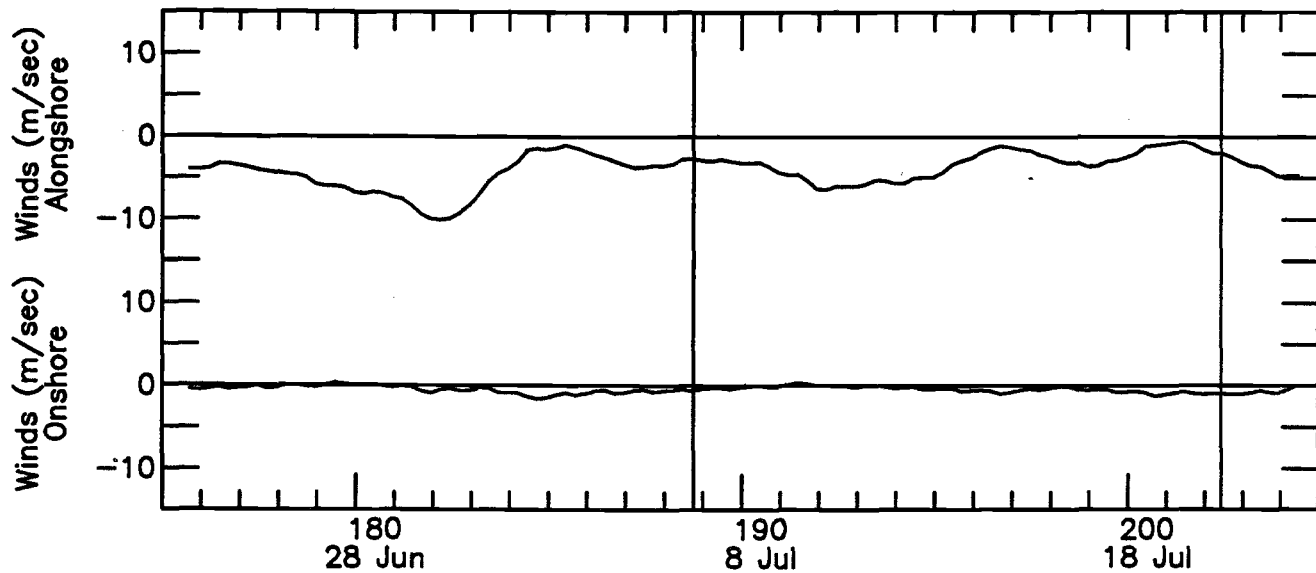
DRIFTER 3

DRIFTER 3

TIME (days)	LAT (deg N)	LON (deg W)	SPEED (km/day)
188.76	34.57	121.15	
189.42	34.57	121.23	10.73
189.73	34.56	121.21	4.97
190.34	34.54	121.27	10.02
190.57	34.57	121.26	16.11
190.81	34.54	121.25	13.24
191.37	34.53	121.32	11.17
191.61	34.53	121.29	8.29
191.82	34.50	121.30	20.41
192.32	34.45	121.38	17.25
192.59	34.46	121.39	5.96
192.81	34.42	121.39	20.38
193.32	34.39	121.42	8.35
193.63	34.40	121.42	3.35
193.83	34.39	121.40	10.84
194.31	34.40	121.41	3.09
194.88	34.47	121.38	21.97
194.82	34.45	121.35	20.02
195.33	34.45	121.42	12.35
195.59	34.48	121.42	12.93
195.81	34.49	121.40	8.26
196.32	34.55	121.44	15.08
196.83	34.62	121.42	24.92
196.83	34.63	121.41	7.59
197.34	34.69	121.37	16.05
197.78	34.72	121.29	19.52
198.39	34.77	121.18	17.95
198.62	34.79	121.14	18.65
198.82	34.80	121.11	16.73
199.34	34.85	121.05	13.48
199.58	34.92	120.99	38.67
199.78	34.95	120.97	20.11
200.35	35.10	121.02	31.55
201.59	35.49	121.21	36.80
202.43	35.61	121.35	22.26



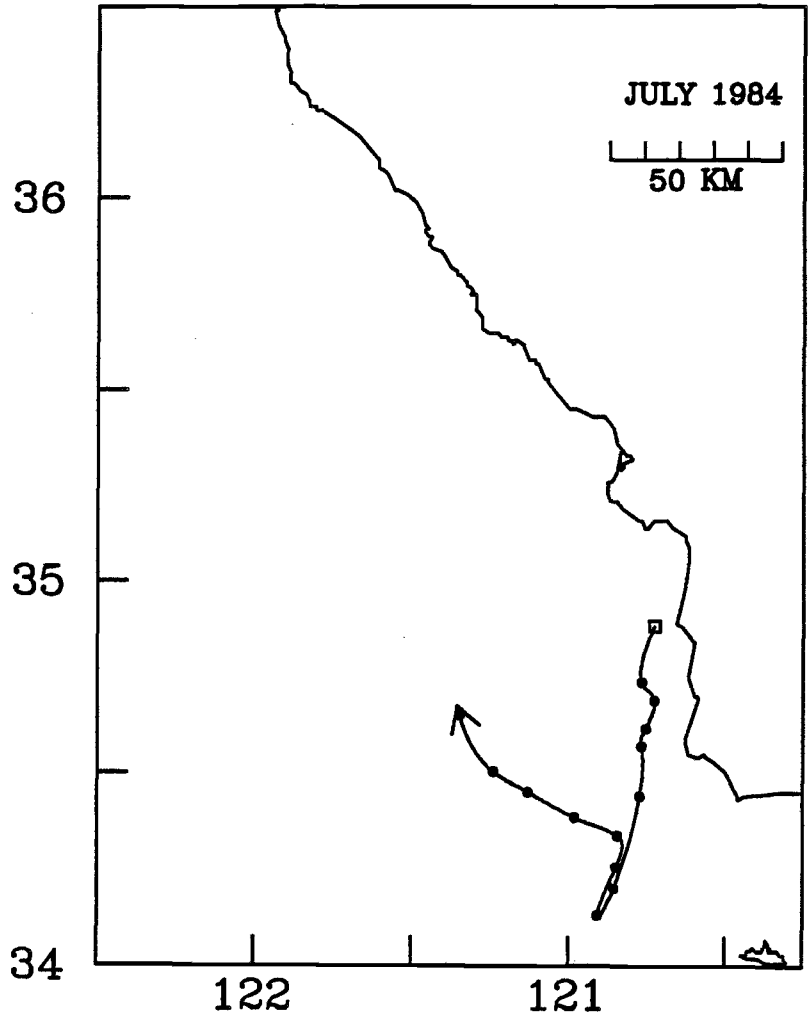
NDBC Buoy 46011



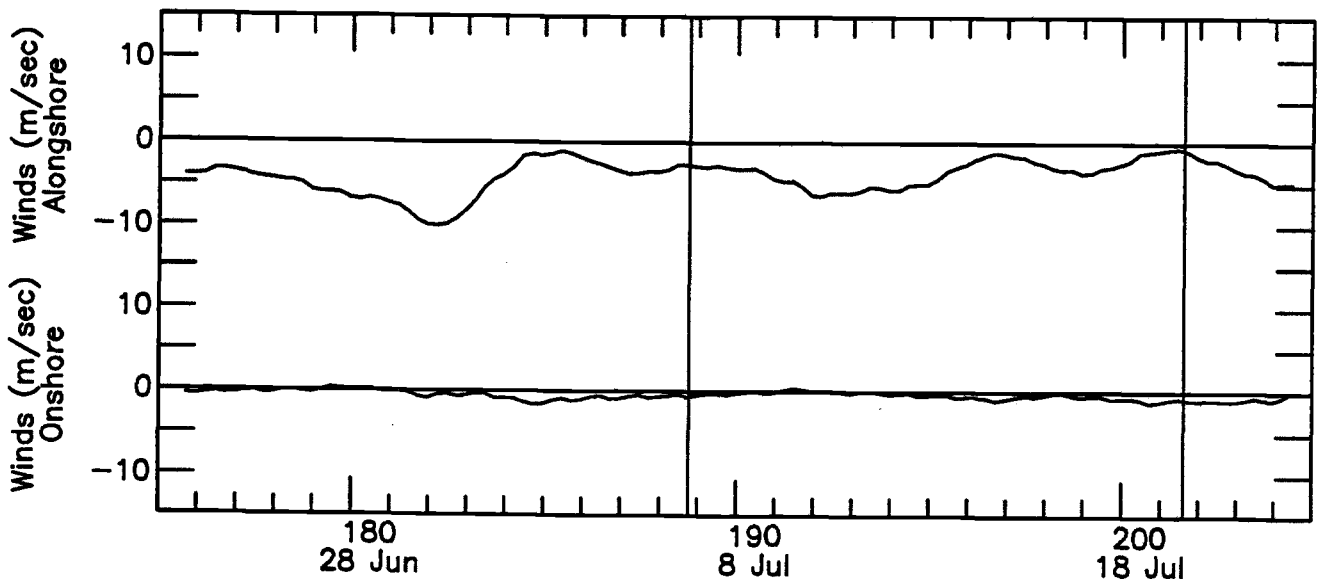
DRIFTER 4

DRIFTER 4

TIME (days)	LAT (deg N)	LON (deg W)	SPEED (km/day)
188.77	34.89	120.73	
189.44	34.75	120.75	23.45
189.75	34.73	120.77	10.11
190.36	34.72	120.74	6.47
190.58	34.70	120.72	12.14
190.83	34.68	120.69	14.11
191.39	34.62	120.74	15.42
191.63	34.63	120.76	10.60
191.83	34.61	120.75	17.12
192.33	34.58	120.79	9.28
192.61	34.57	120.77	5.59
192.83	34.54	120.75	16.56
193.34	34.47	120.76	15.54
193.65	34.42	120.76	19.34
193.84	34.36	120.76	33.02
194.32	34.19	120.86	43.56
194.69	34.16	120.88	9.71
194.84	34.16	120.88	4.42
195.36	34.11	120.94	13.89
195.63	34.12	120.90	14.38
195.82	34.13	120.88	9.96
196.36	34.21	120.88	16.16
196.66	34.27	120.82	30.97
196.84	34.28	120.82	5.07
197.36	34.33	120.86	12.47
197.80	34.30	120.89	8.58
198.41	34.36	120.98	17.79
198.65	34.40	121.02	25.29
198.84	34.41	121.03	8.29
199.37	34.42	121.13	16.08
199.61	34.45	121.16	20.36
199.81	34.46	121.15	4.83
200.38	34.49	121.25	16.64
201.61	34.67	121.36	18.39



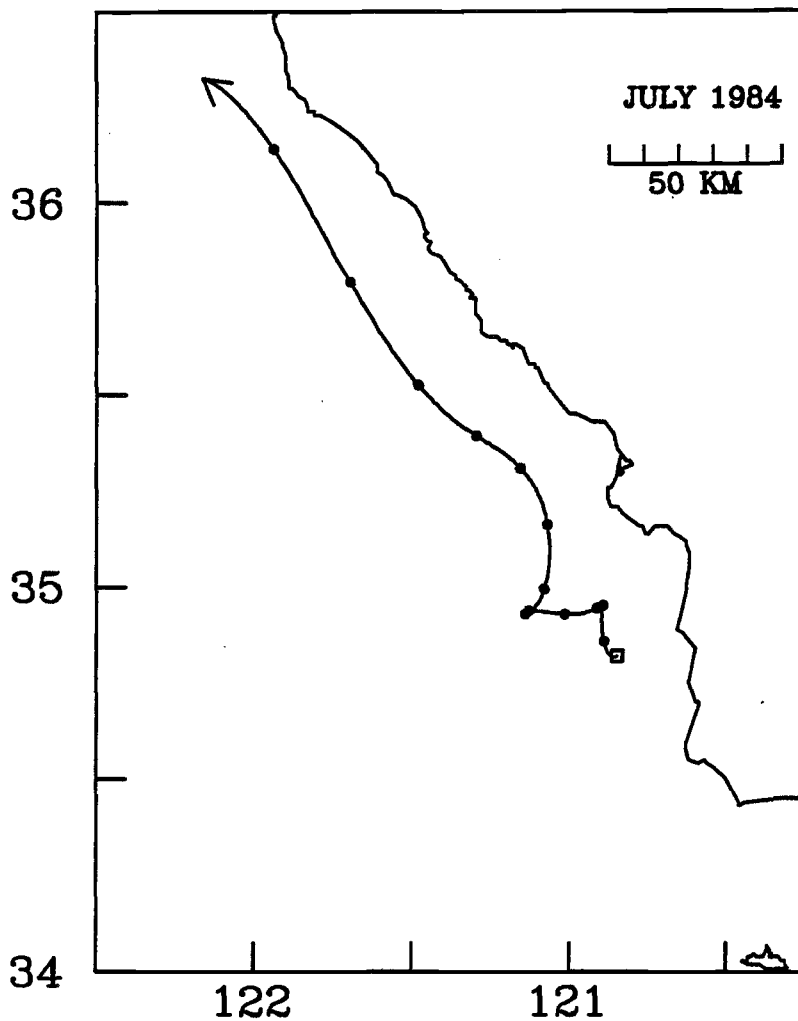
NDBC Buoy 46011



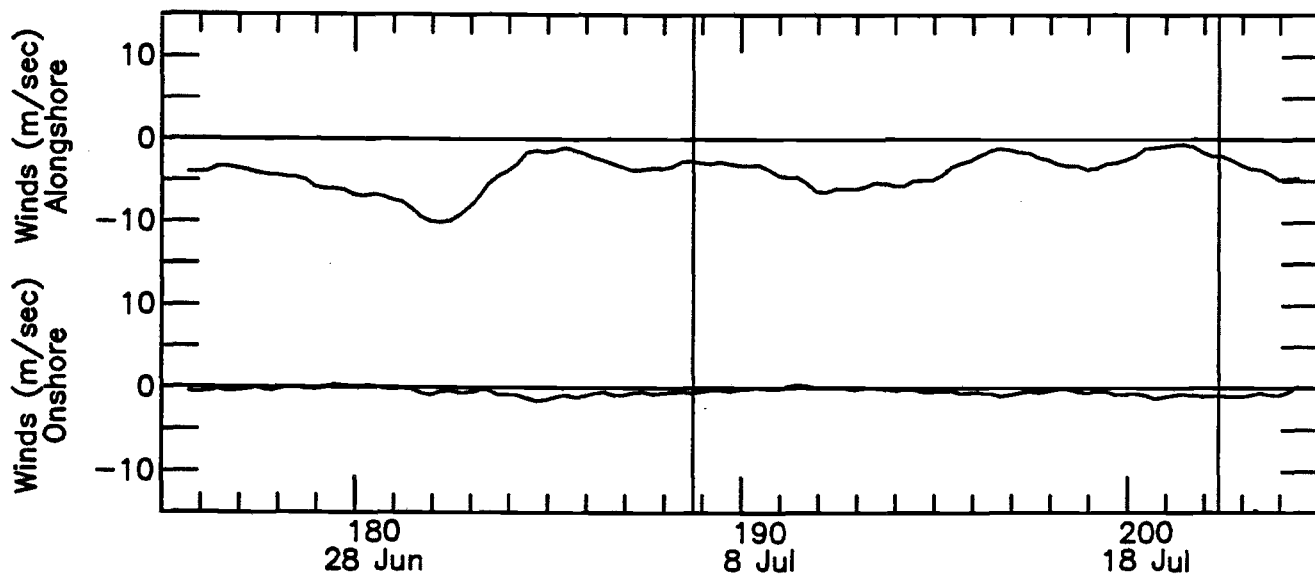
DRIFTER 5

DRIFTER 5

TIME (days)	LAT (deg N)	LON (deg W)	SPEED (km/day)
188.77	34.80	120.84	
189.44	34.83	120.88	6.98
189.74	34.88	120.87	17.61
190.35	34.89	120.88	3.38
190.59	34.94	120.89	22.82
190.82	34.95	120.85	15.97
191.40	34.90	120.90	11.56
191.65	34.93	120.91	11.12
191.84	34.90	120.90	18.52
192.29	34.88	120.99	19.58
192.55	34.91	121.01	14.14
192.80	34.90	121.01	5.33
193.31	34.91	121.11	18.89
193.59	34.93	121.12	8.22
193.82	34.90	121.13	19.08
194.29	34.90	121.15	3.36
194.65	34.92	121.13	6.46
194.81	34.90	121.12	9.89
195.31	34.96	121.08	12.97
195.57	35.02	121.07	26.19
195.78	35.03	121.05	13.89
196.29	35.11	121.08	17.10
196.59	35.18	121.07	24.93
196.80	35.23	121.08	26.51
197.31	35.30	121.16	20.84
197.72	35.35	121.18	14.26
198.37	35.41	121.31	20.44
198.60	35.43	121.29	13.35
198.80	35.42	121.36	30.24
199.32	35.52	121.46	28.20
199.55	35.56	121.51	27.62
199.76	35.61	121.55	34.81
200.33	35.75	121.66	31.75
201.56	36.17	121.96	44.23
202.38	36.34	122.18	32.39



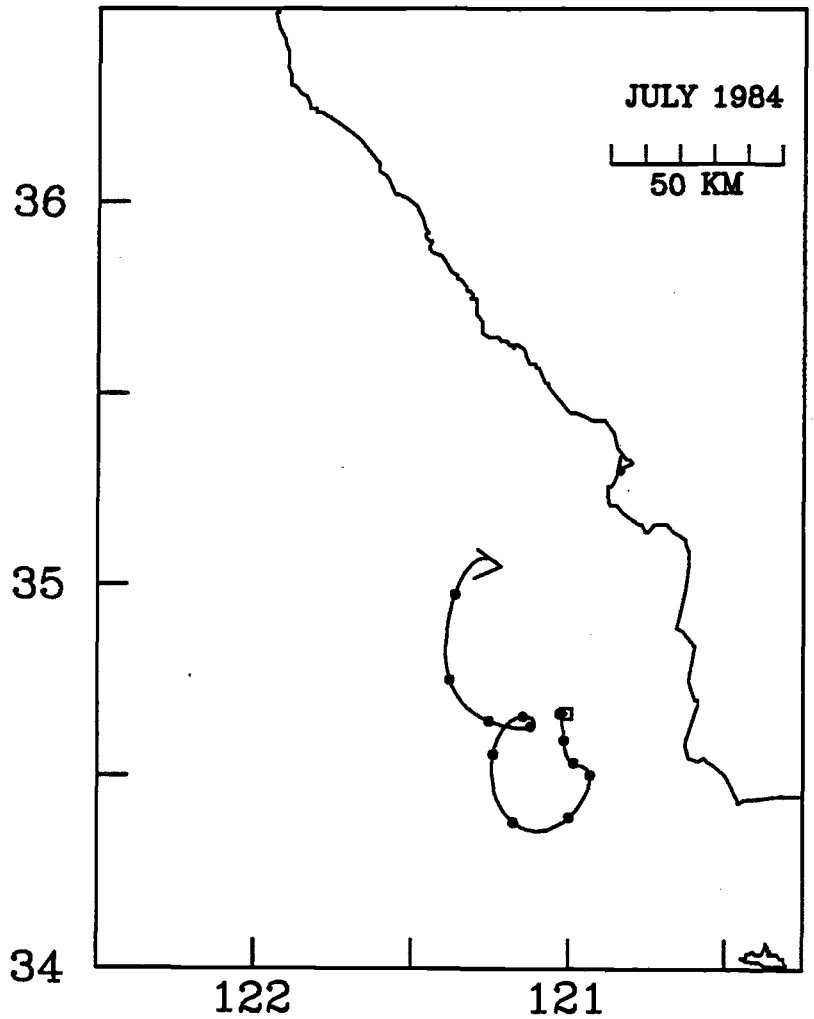
NDBC Buoy 46011



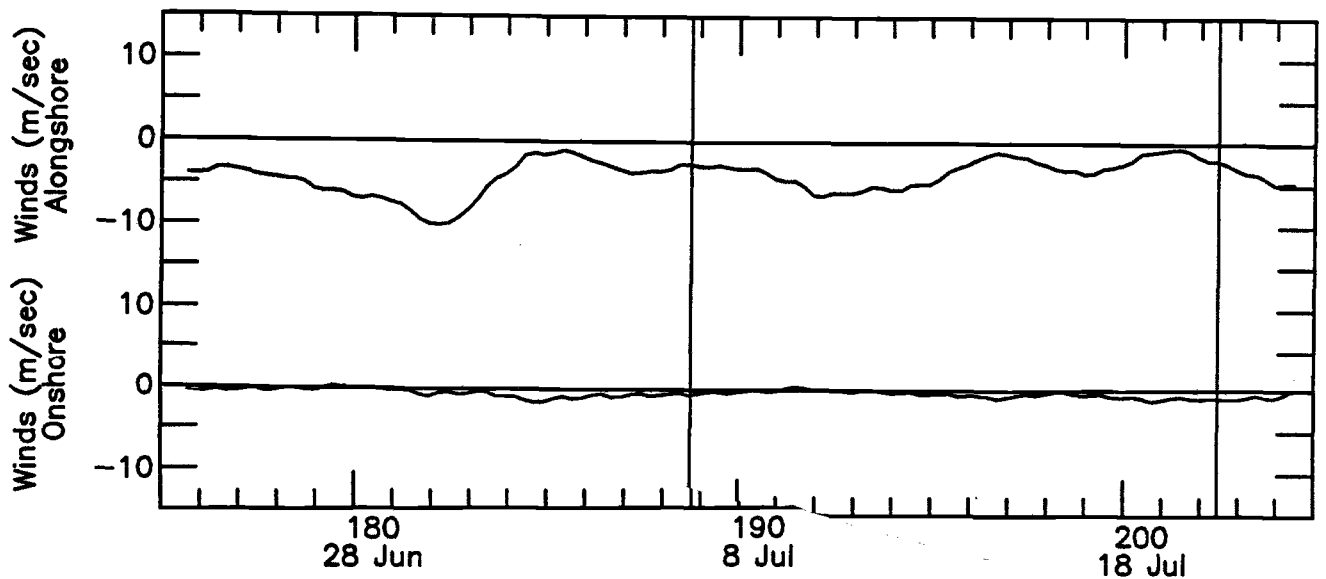
DRIFTER 6

DRIFTER 6

TIME (days)	LAT (deg N)	LON (deg W)	SPEED (km/day)
188.76	34.66	121.01	
189.43	34.66	121.03	3.10
189.73	34.67	121.01	9.29
190.34	34.67	121.04	5.56
190.57	34.67	121.02	7.56
190.81	34.83	121.01	19.07
191.38	34.61	121.03	3.67
191.62	34.60	121.00	12.12
191.82	34.56	120.98	24.89
192.32	34.51	121.00	10.39
192.60	34.54	120.97	14.02
192.82	34.50	120.94	23.73
193.33	34.48	120.97	7.02
193.64	34.51	120.95	14.26
193.84	34.47	120.93	26.01
194.32	34.38	120.97	23.25
194.68	34.39	121.01	10.68
194.85	34.35	121.00	25.89
195.37	34.32	121.20	36.05
195.64	34.41	121.23	38.66
195.81	34.42	121.21	13.07
196.32	34.48	121.29	19.95
196.64	34.61	121.25	45.25
196.82	34.64	121.16	51.97
197.34	34.62	121.17	4.04
197.79	34.64	121.11	11.55
198.39	34.62	121.15	6.54
198.62	34.63	121.17	5.70
198.82	34.65	121.16	9.40
199.35	34.63	121.23	12.85
199.59	34.66	121.26	18.39
199.79	34.67	121.28	13.87
200.36	34.72	121.41	22.62
201.60	35.01	121.35	25.80
202.46	35.04	121.22	14.64



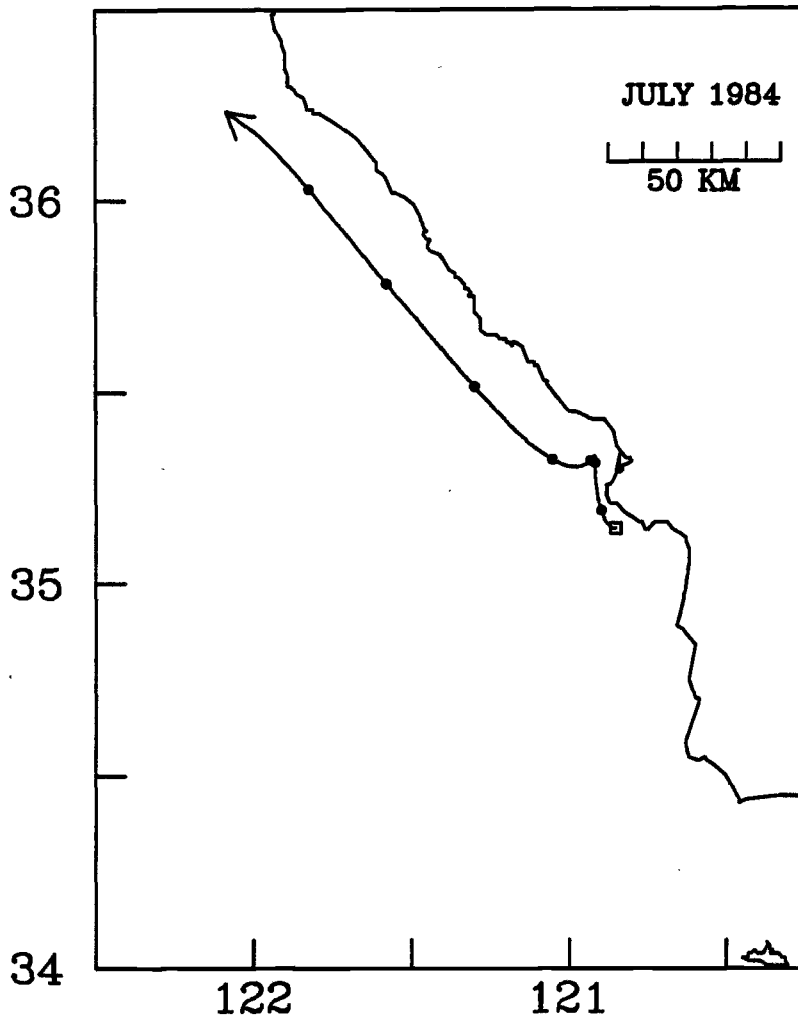
NDBC Buoy 46011



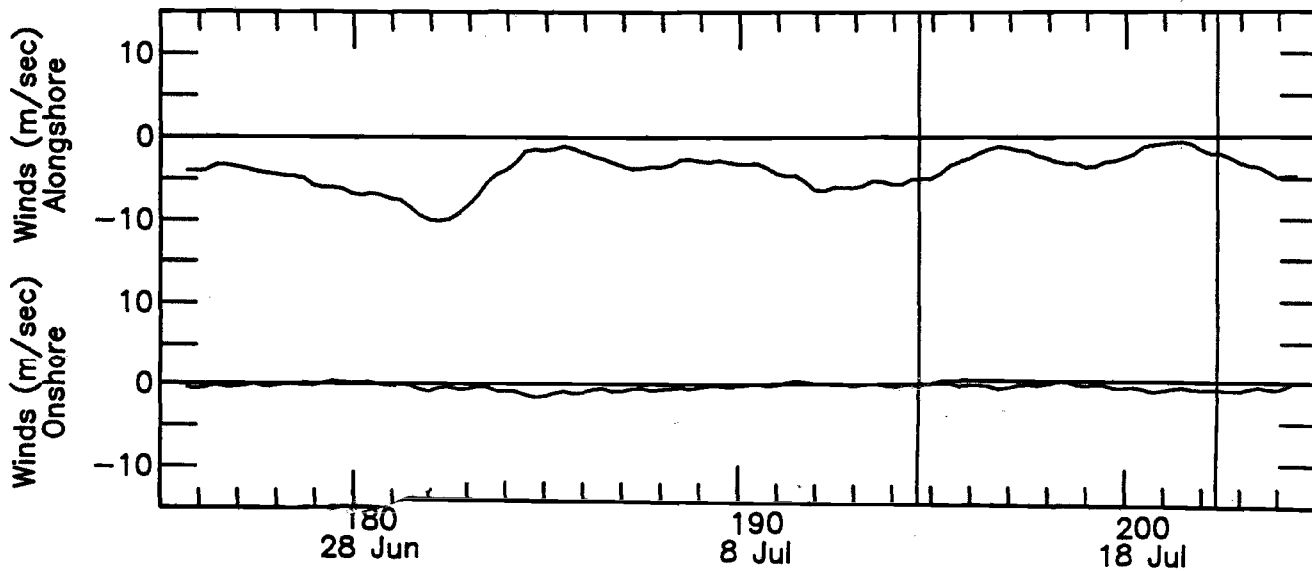
DRIFTER 7

DRIFTER 7

TIME (days)	LAT (deg N)	LON (deg W)	SPEED (km/day)
194.64	35.13	120.83	
194.80	35.13	120.86	18.83
195.29	35.17	120.89	9.09
195.55	35.20	120.87	16.46
195.78	35.19	120.88	5.24
196.28	35.26	120.95	19.86
196.58	35.33	120.92	24.78
196.79	35.33	120.88	14.07
197.30	35.33	120.92	6.19
197.71	35.30	120.92	7.54
198.37	35.30	121.03	15.60
198.59	35.33	121.08	26.55
198.80	35.37	121.13	29.84
199.32	35.44	121.25	26.14
199.55	35.54	121.29	50.71
199.76	35.60	121.35	37.54
200.32	35.72	121.57	43.25
201.55	36.05	121.83	34.88
202.38	36.24	122.10	39.40



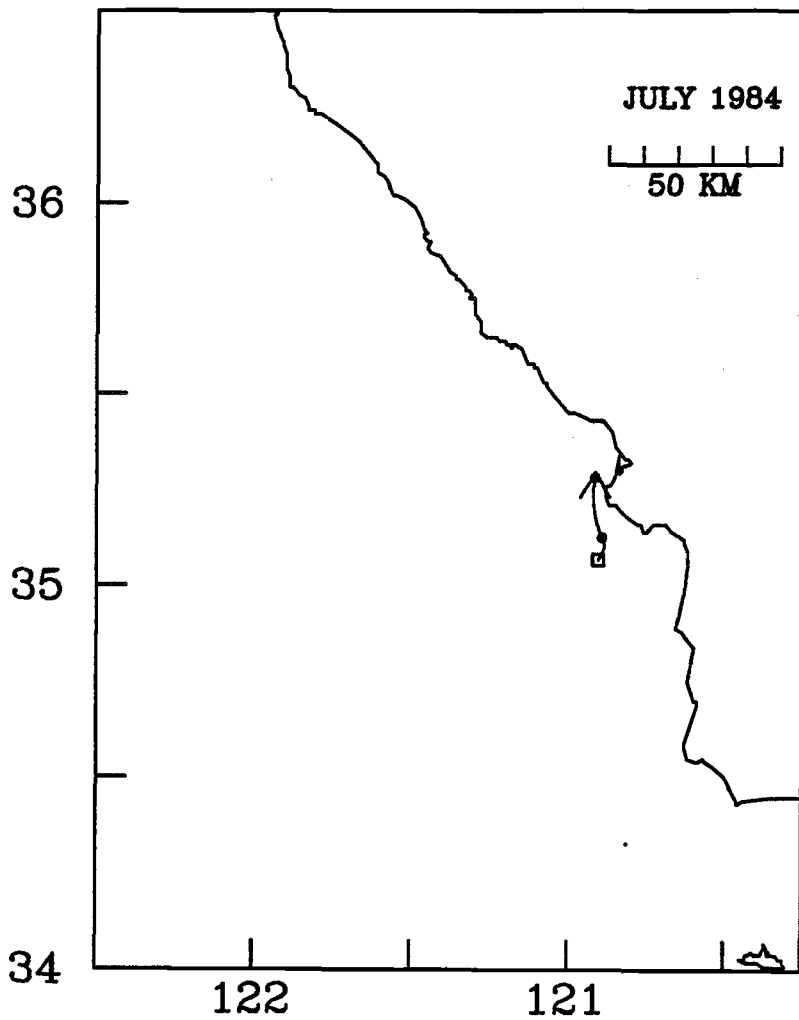
NDBC Buoy 46011



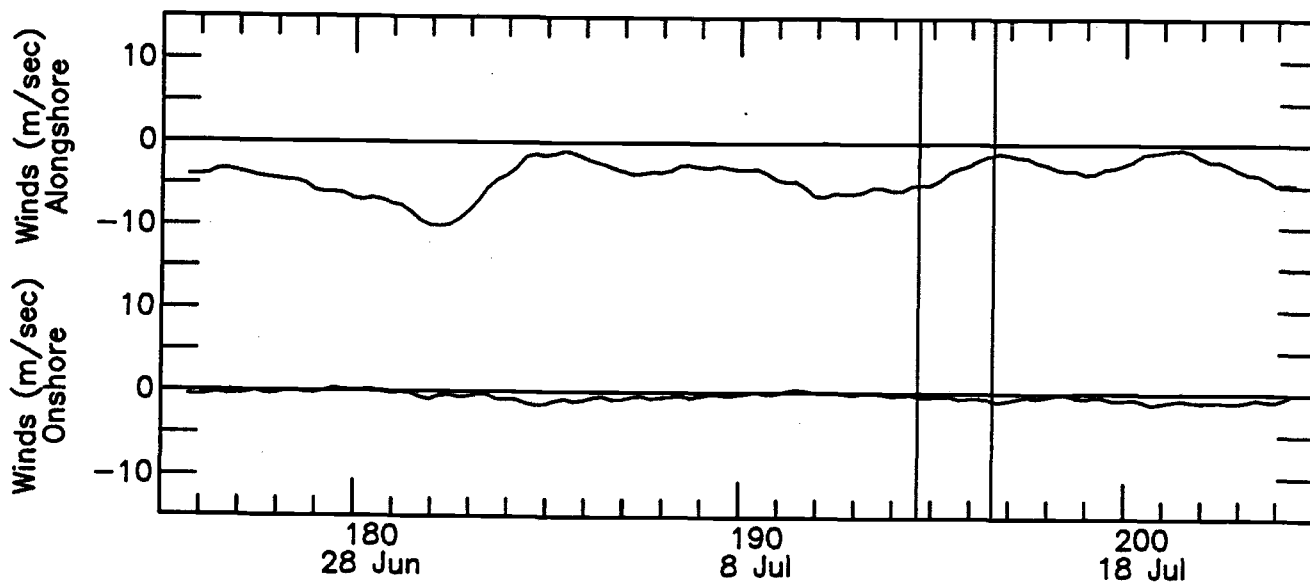
DRIFTER 8

DRIFTER 8

TIME (days)	LAT (deg N)	LON (deg W)	SPEED (km/day)
194.64	35.08	120.89	
194.80	35.07	120.91	11.64
195.30	35.13	120.90	13.89
195.55	35.12	120.88	9.56
195.78	35.14	120.89	8.80
196.29	35.24	120.95	24.43
196.59	35.30	120.90	29.27



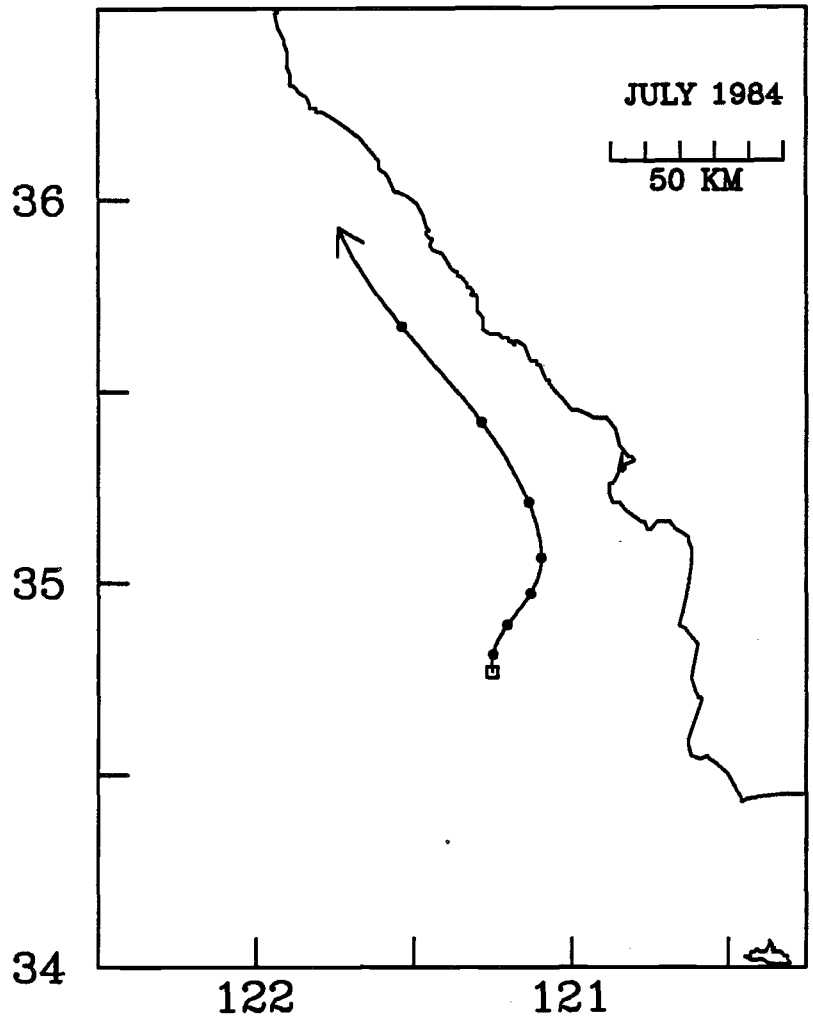
NDBC Buoy 46011



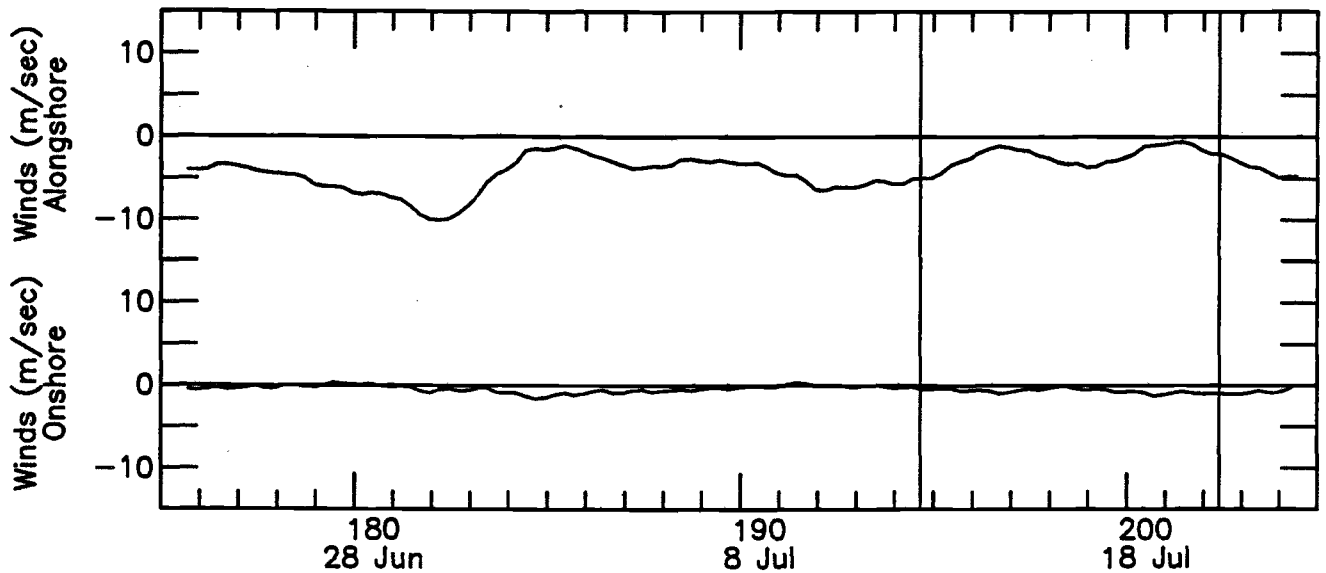
DRIFTER 9

DRIFTER 9

TIME (days)	LAT (deg N)	LON (deg W)	SPEED (km/day)
194.86	34.76	121.25	
194.81	34.76	121.25	1.93
195.32	34.78	121.26	6.07
195.58	34.82	121.22	20.66
195.79	34.82	121.23	4.76
196.30	34.86	121.22	8.53
196.60	34.90	121.22	18.11
196.81	34.89	121.17	22.59
197.32	34.95	121.13	14.86
197.73	34.99	121.11	12.47
198.38	35.06	121.09	11.99
198.61	35.06	121.09	1.48
198.81	35.10	121.12	23.09
199.33	35.19	121.13	19.02
199.57	35.22	121.12	14.34
199.77	35.27	121.15	29.33
200.34	35.39	121.26	28.55
201.57	35.69	121.56	35.27
202.42	35.94	121.74	37.81

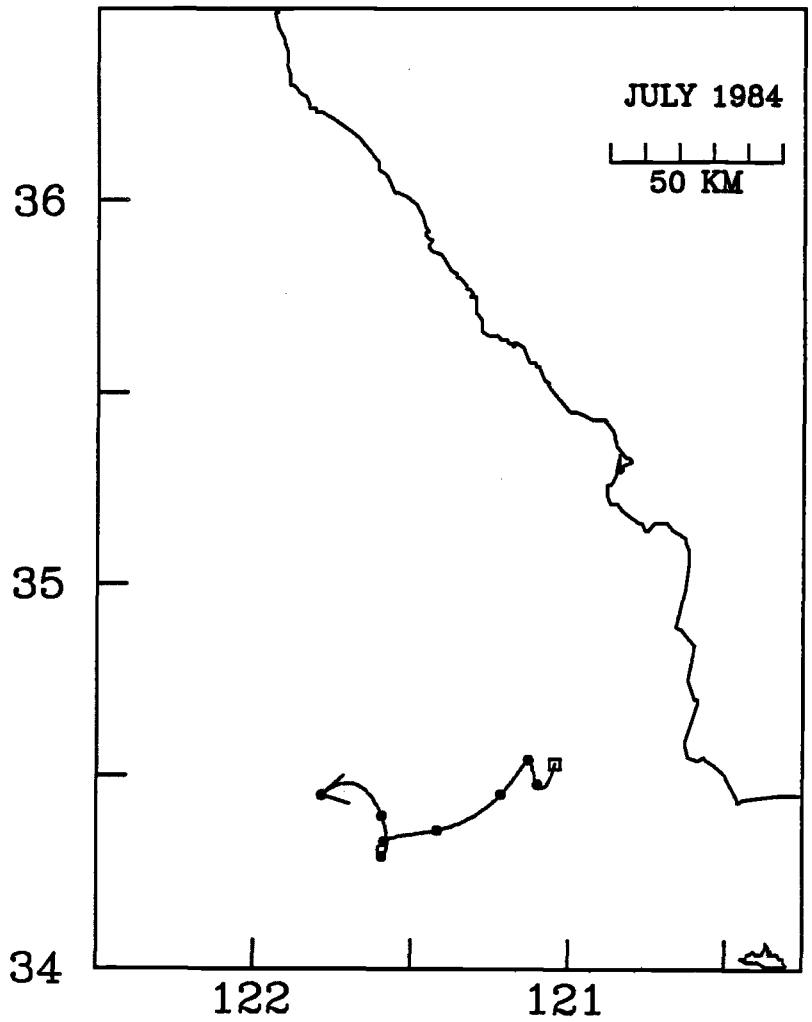


NDBC Buoy 46011

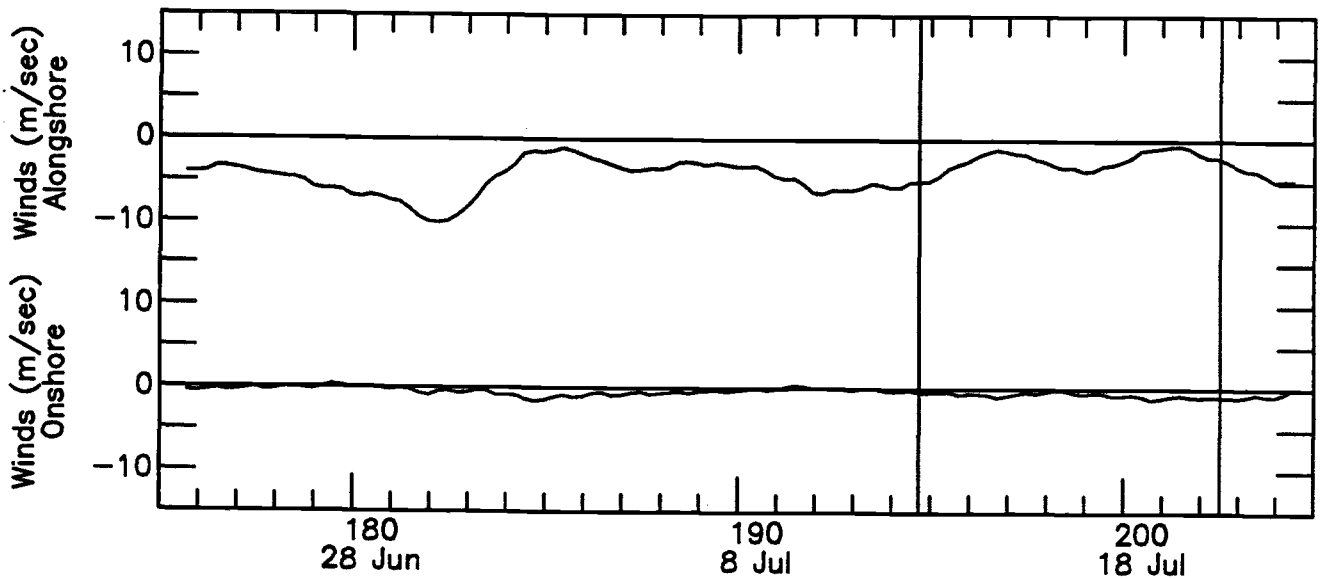


DRIFTER 10

TIME (days)	LAT (deg N)	LON (deg W)	SPEED (km/day)
194.71	34.54	121.06	
194.83	34.51	121.02	38.46
195.33	34.45	121.09	17.48
195.60	34.52	121.11	28.46
195.80	34.51	121.07	20.29
196.31	34.49	121.15	14.56
196.62	34.56	121.15	27.67
196.82	34.56	121.09	29.55
197.33	34.46	121.20	30.64
197.79	34.42	121.26	15.82
198.40	34.36	121.42	25.57
198.63	34.35	121.43	5.74
198.83	34.33	121.47	21.86
199.36	34.34	121.58	19.93
199.60	34.34	121.59	5.25
199.79	34.32	121.83	20.00
200.37	34.27	121.59	11.91
201.62	34.42	121.61	13.97
202.53	34.44	121.79	18.50

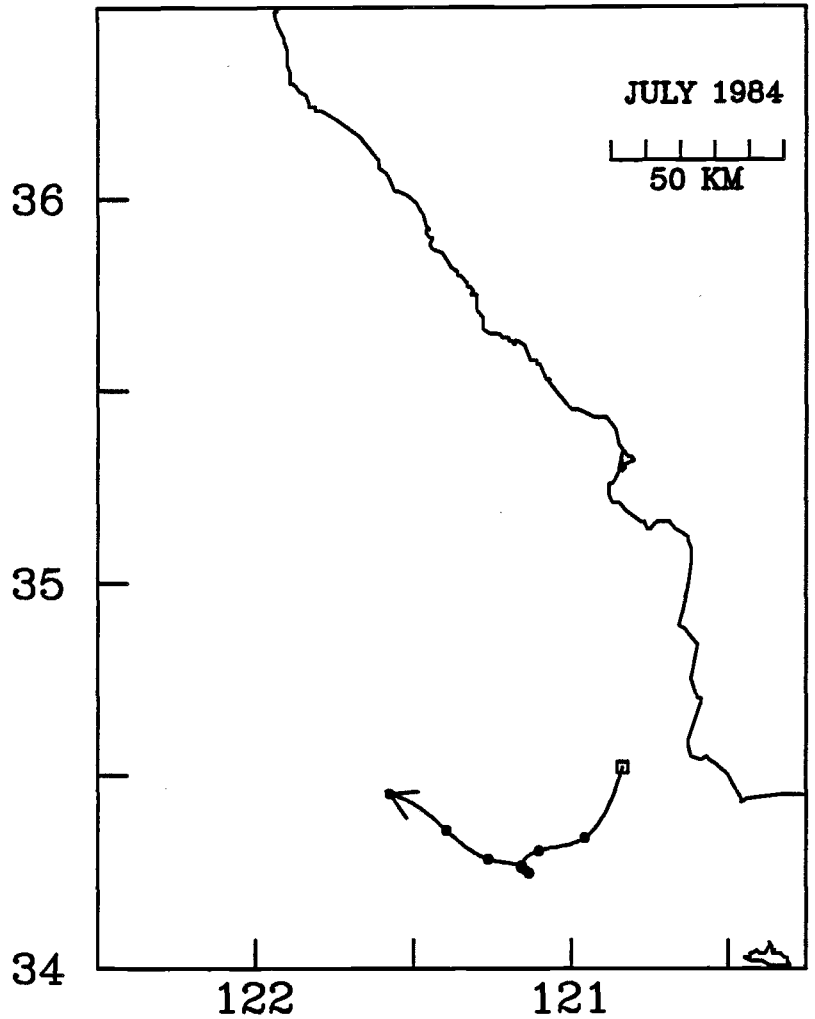


NDBC Buoy 46011

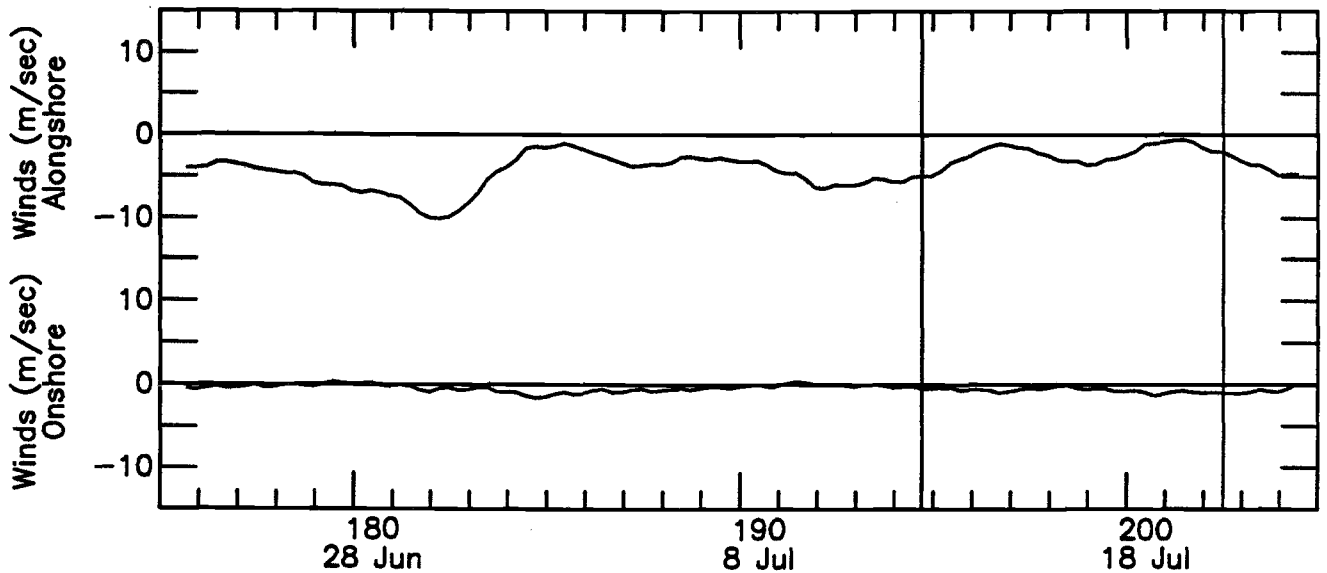


DRIFTER 11

DRIFTER 11			
TIME (days)	LAT (deg N)	LON (deg W)	SPEED (km/day)
194.71	34.52	120.84	
194.83	34.48	120.84	34.02
195.34	34.34	120.95	36.08
195.61	34.36	120.98	10.81
195.82	34.30	120.97	30.91
196.33	34.29	121.12	26.59
196.65	34.34	121.10	16.74
196.84	34.29	121.09	28.56
197.35	34.25	121.18	19.22
197.80	34.24	121.18	4.89
198.41	34.24	121.13	8.28
198.64	34.26	121.11	11.36
198.83	34.25	121.11	9.20
199.37	34.25	121.17	9.67
199.61	34.27	121.19	13.79
199.80	34.26	121.18	8.75
200.38	34.28	121.24	9.79
201.62	34.37	121.42	15.71
202.51	34.45	121.58	19.37

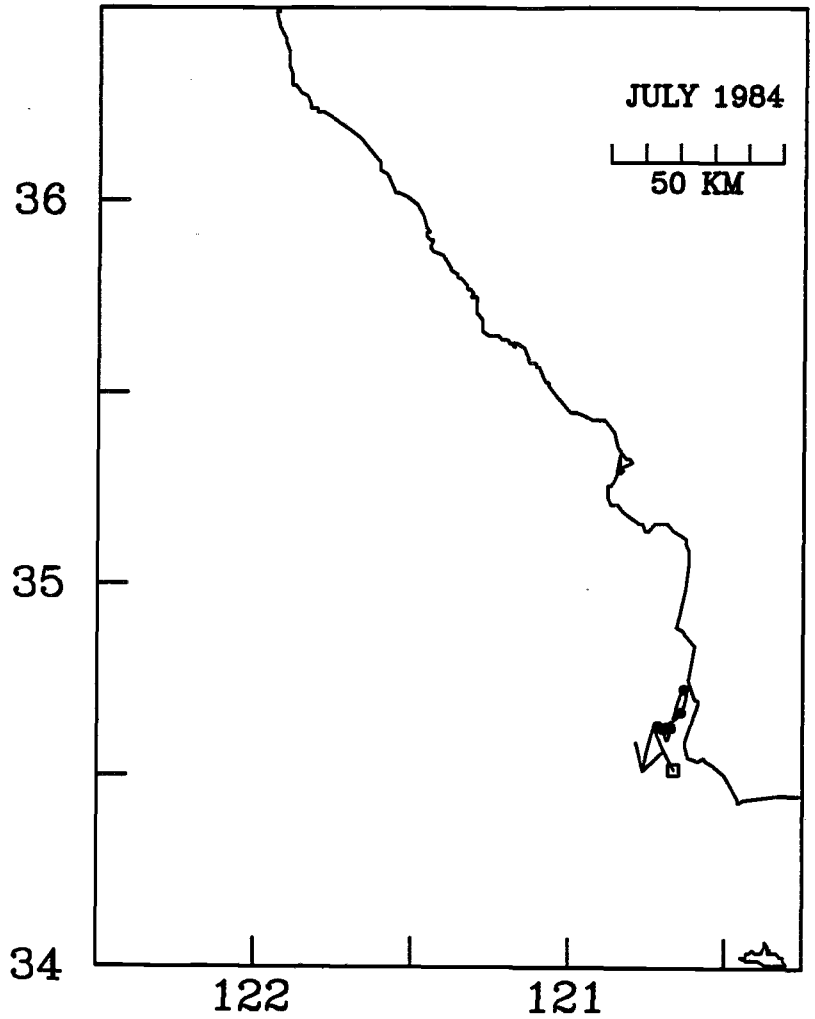


NDBC Buoy 46011

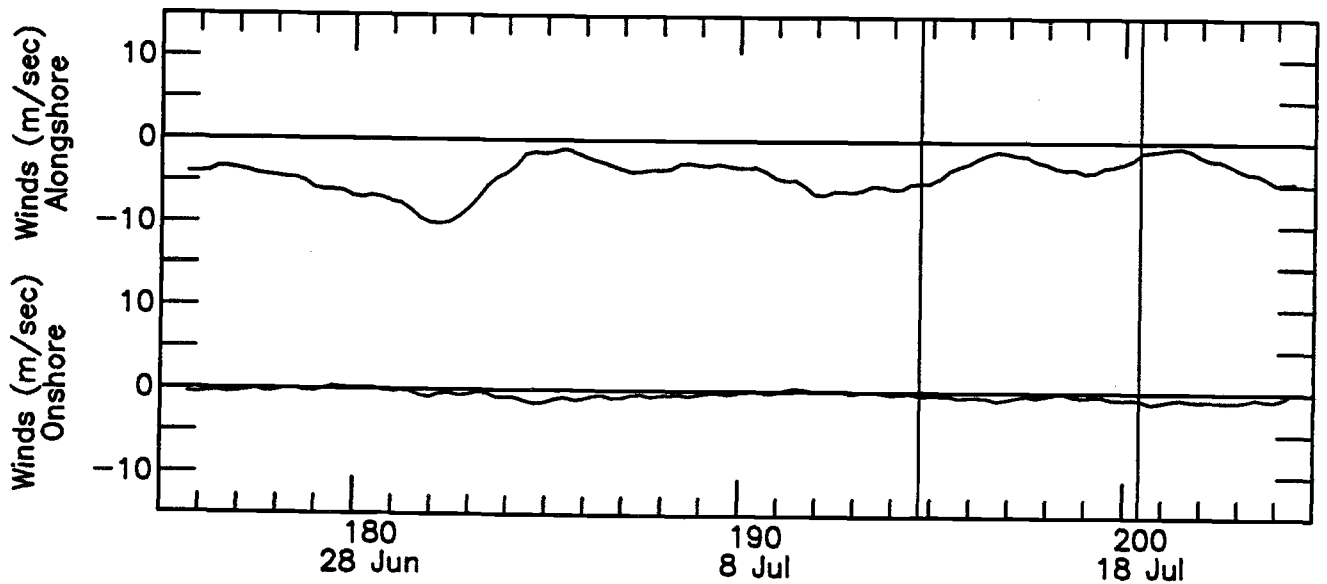


DRIFTER 12

TIME (days)	LAT (deg N)	LON (deg W)	SPEED (km/day)
194.71	34.54	120.67	
194.84	34.54	120.68	14.09
195.35	34.61	120.74	18.47
195.62	34.66	120.71	22.64
195.84	34.65	120.68	11.94
196.37	34.65	120.66	3.64
196.67	34.68	120.62	17.14
196.85	34.69	120.62	4.87
197.37	34.74	120.65	11.92
197.82	34.72	120.65	5.87
198.46	34.65	120.66	10.93
198.68	34.63	120.67	14.91
198.87	34.59	120.69	20.59
199.39	34.57	120.71	6.90
199.64	34.57	120.71	0.88
199.82	34.56	120.68	14.14
199.83	34.85	120.72	*****
200.42	34.48	120.77	70.32

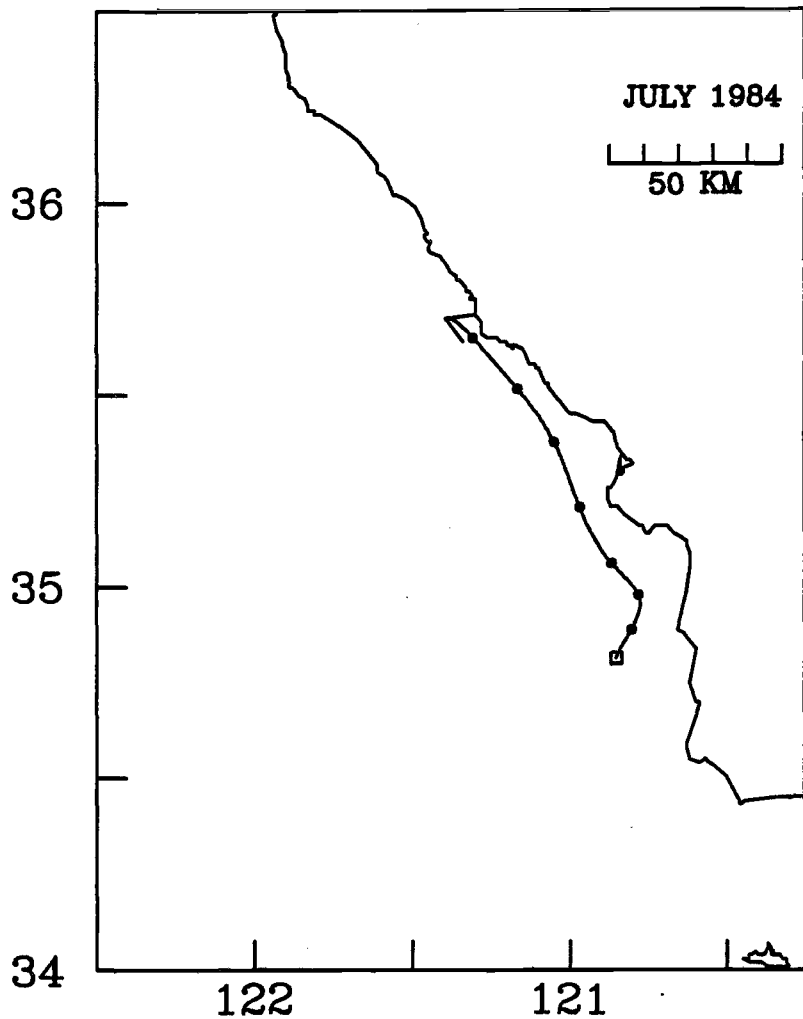


NDBC Buoy 46011

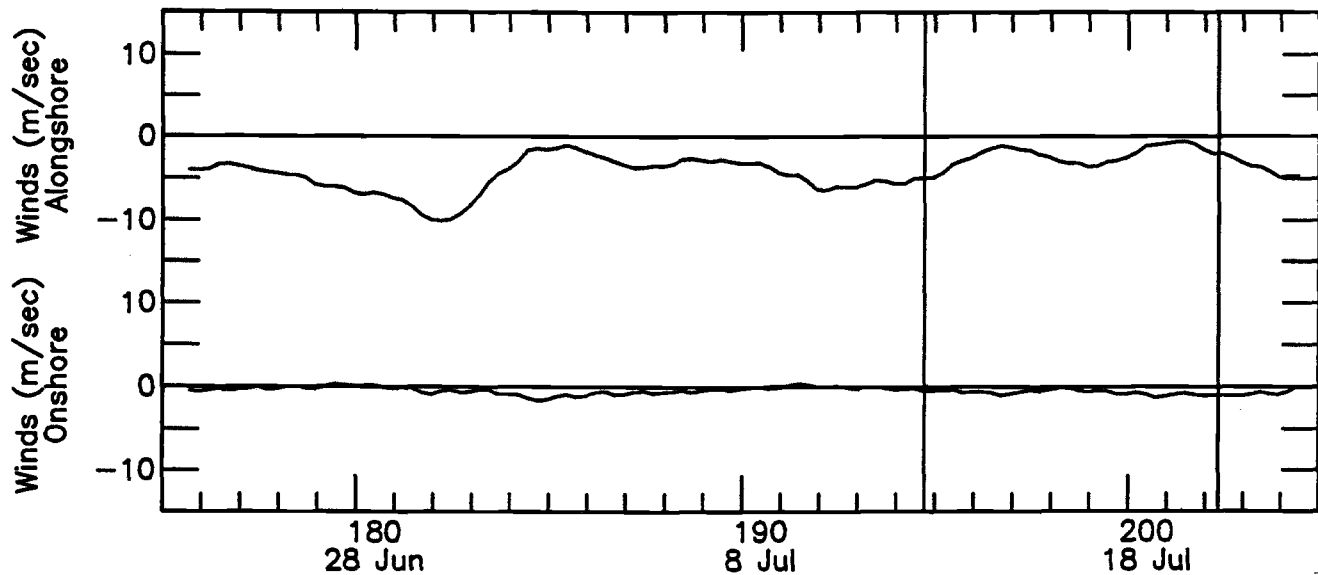


DRIFTER 13

DRIFTER 13			
TIME (days)	LAT (deg N)	LON (deg W)	SPEED (km/day)
194.72	34.81	120.85	
194.86	34.80	120.84	6.25
195.38	34.87	120.84	13.32
195.65	34.91	120.78	26.41
195.84	34.88	120.74	25.52
196.38	34.96	120.83	22.36
196.68	35.01	120.76	28.37
196.86	34.98	120.75	15.91
197.29	35.02	120.86	25.80
197.71	35.09	120.93	22.19
198.36	35.19	120.94	18.06
198.58	35.22	120.95	11.62
198.79	35.24	120.98	21.32
199.30	35.36	121.05	29.35
199.54	35.38	121.05	7.38
199.75	35.41	121.09	28.16
200.32	35.49	121.13	16.66
201.54	35.66	121.32	20.43
202.36	35.70	121.39	10.39

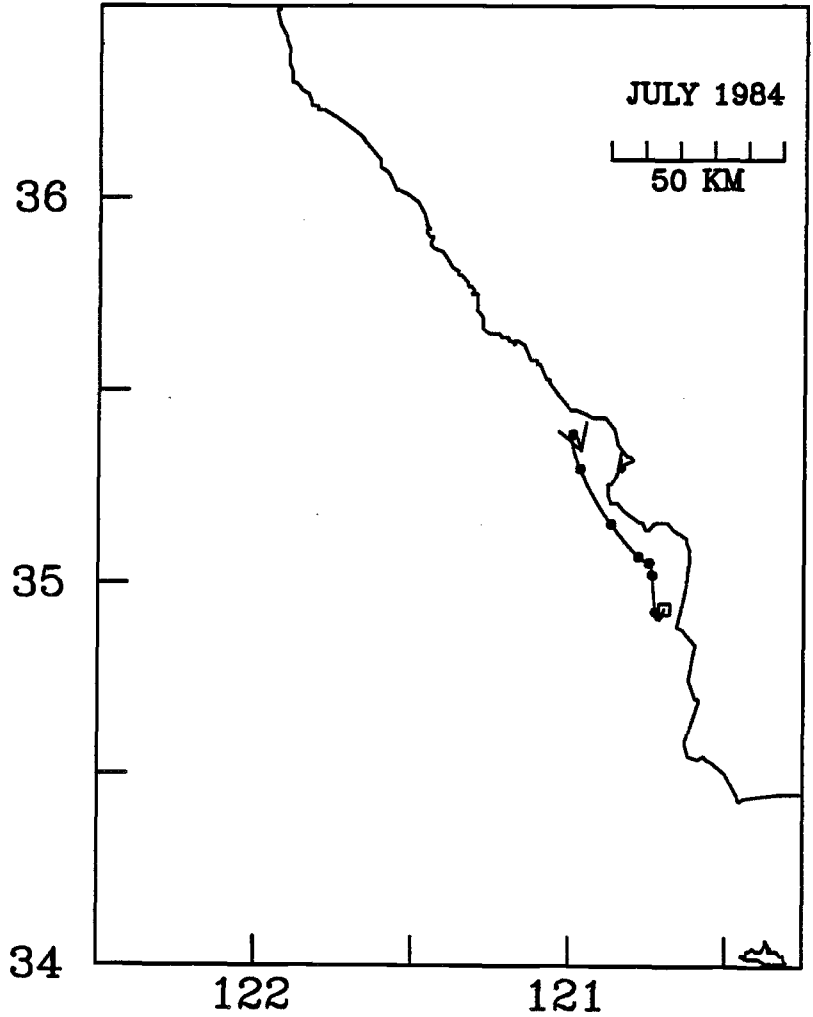


NDBC Buoy 46011

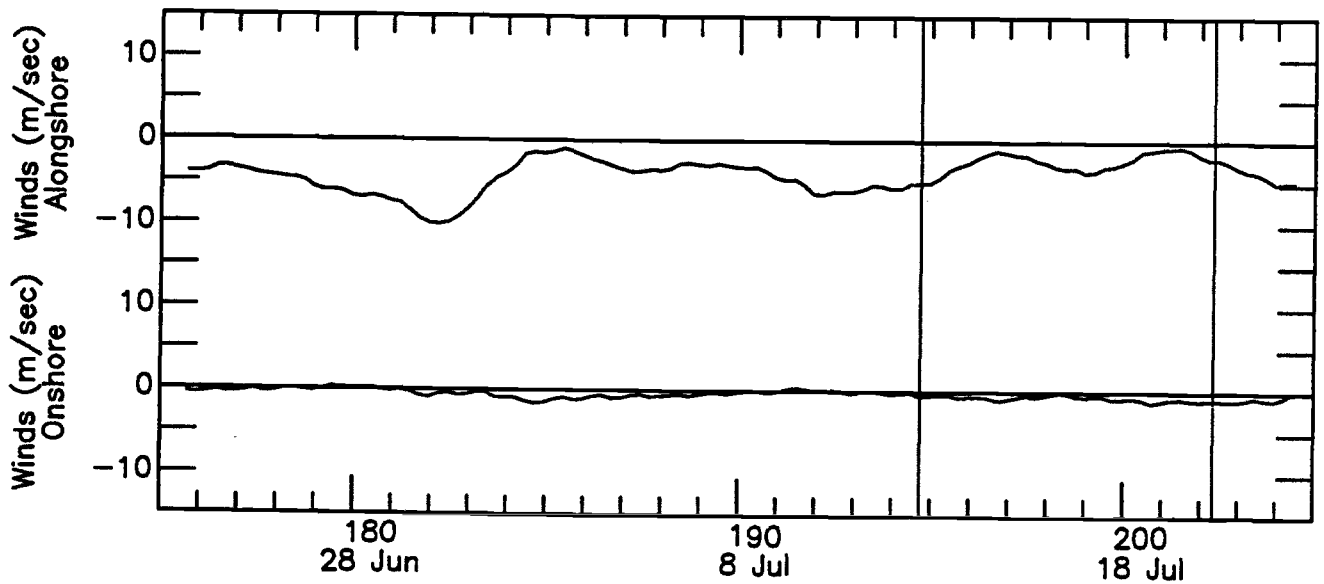


DRIFTER 14

TIME (days)	LAT (deg N)	LON (deg W)	SPEED (km/day)
194.73	34.94	120.71	
194.87	34.90	120.69	27.51
195.39	34.90	120.76	12.05
195.66	34.96	120.72	30.24
195.84	34.95	120.70	11.59
196.38	35.00	120.78	15.99
196.68	35.05	120.73	24.39
196.86	35.04	120.71	12.71
197.29	35.03	120.76	11.56
197.70	35.06	120.75	7.71
198.35	35.08	120.78	5.54
198.57	35.07	120.79	8.87
198.79	35.08	120.80	10.90
199.29	35.12	120.86	14.12
199.54	35.17	120.88	20.09
199.74	35.19	120.87	11.67
200.31	35.28	120.98	25.18
201.54	35.39	120.99	10.26
202.35	35.34	120.97	6.76

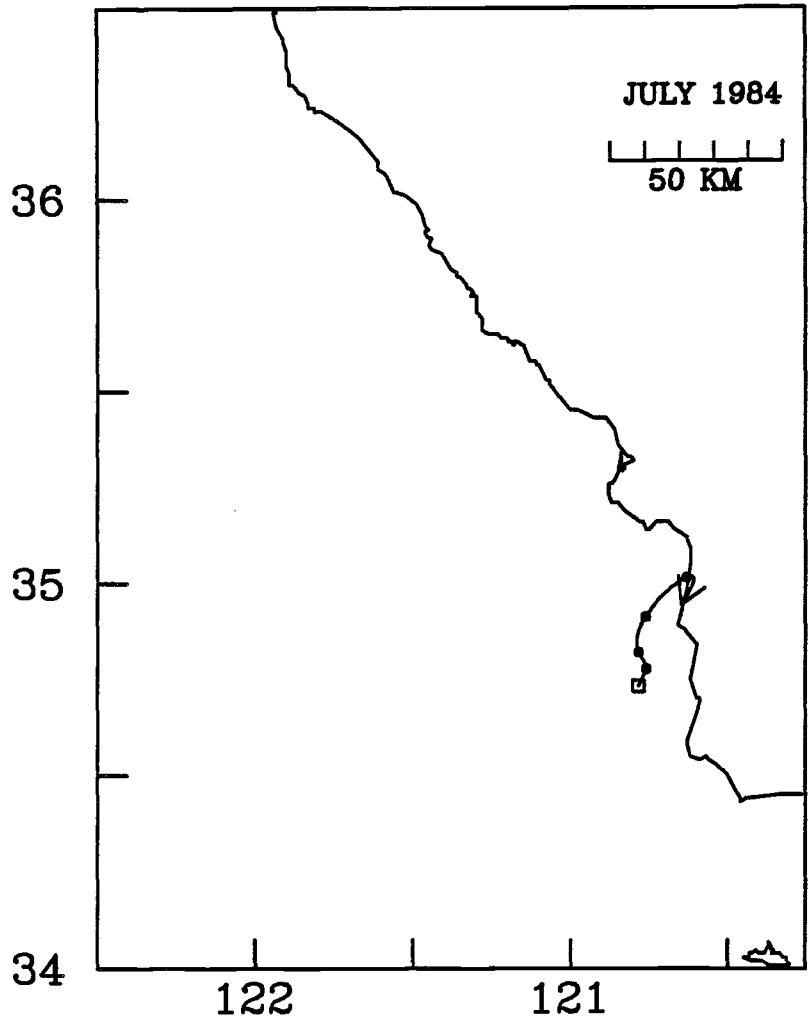


NDBC Buoy 46011

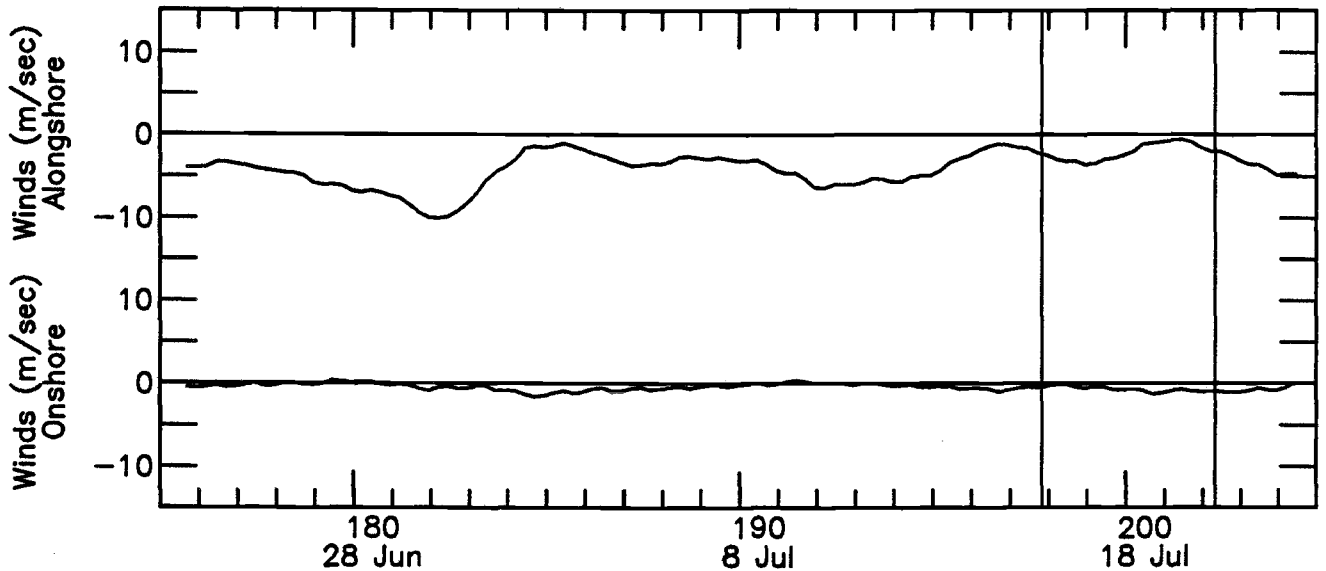


DRIFTER 15

DRIFTER	15		
TIME (days)	LAT (deg N)	LON (deg W)	SPEED (km/day)
197.83	34.73	120.78	
198.46	34.79	120.80	10.15
198.68	34.80	120.74	26.06
198.87	34.76	120.75	20.79
199.43	34.80	120.80	11.65
199.65	34.87	120.77	37.92
200.43	34.89	120.78	3.52
201.66	35.02	120.61	17.18
202.33	34.93	120.66	16.14



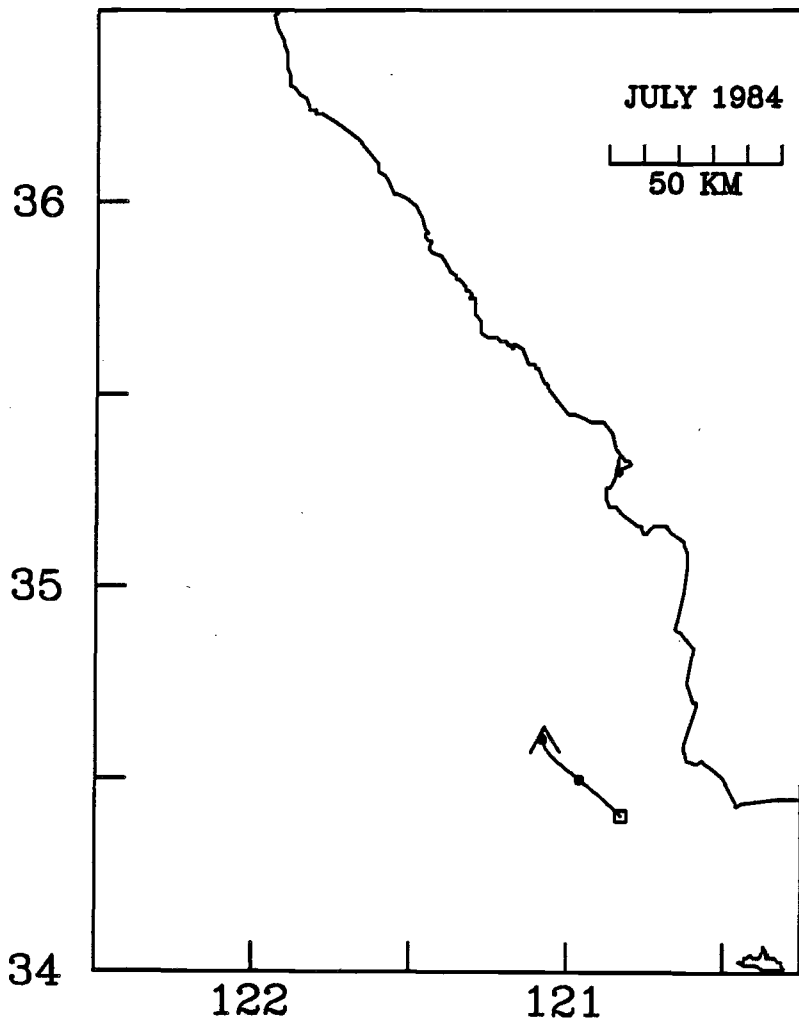
NDBC Buoy 46011



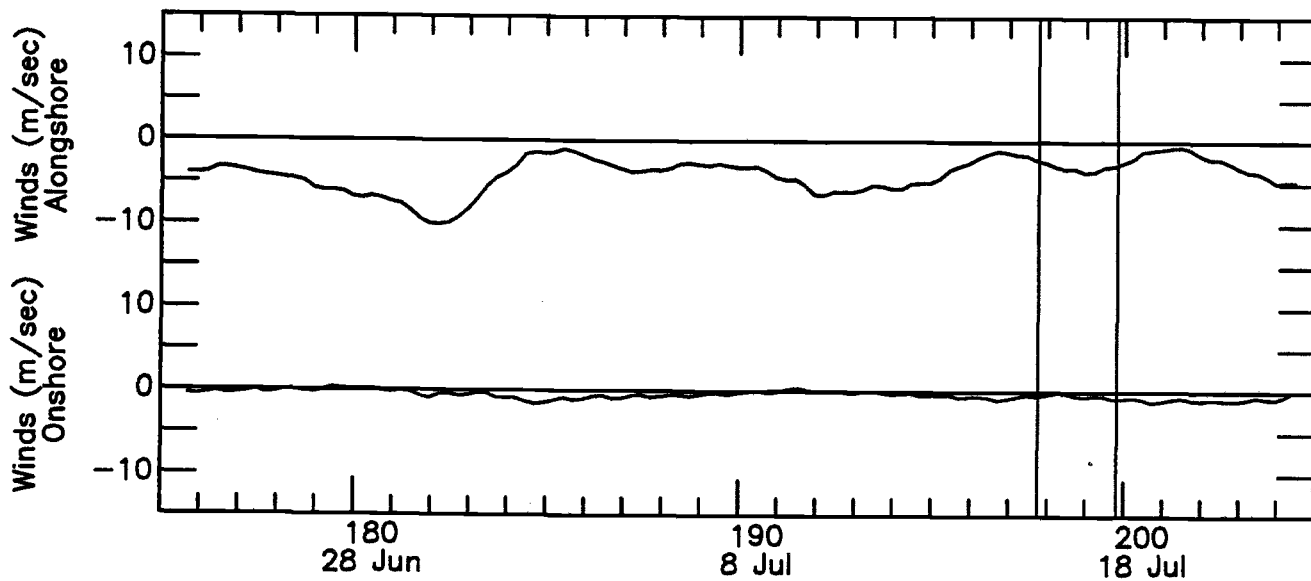
DRIFTER 16

DRIFTER 16

TIME (days)	LAT (deg N)	LON (deg W)	SPEED (km/day)
197.77	34.41	120.83	
198.43	34.49	120.94	19.95
198.85	34.52	121.01	31.65
198.85	34.55	121.01	15.62
199.38	34.59	121.07	13.89
199.63	34.61	121.10	15.48
199.82	34.64	121.06	25.59



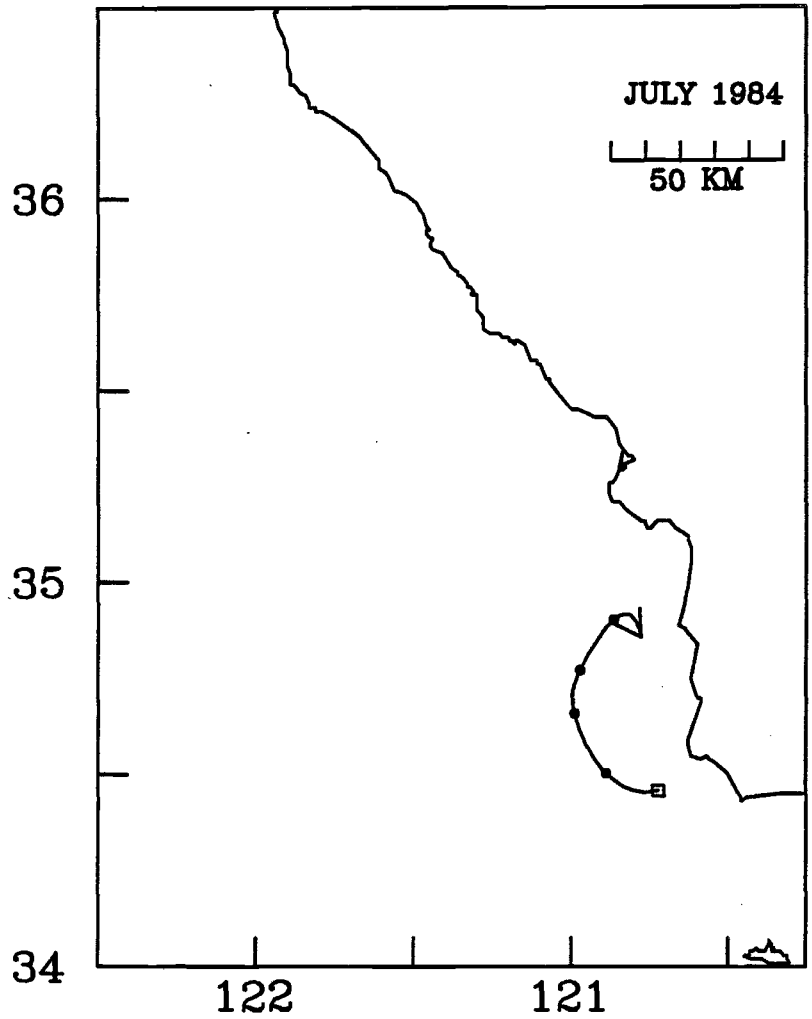
NDBC Buoy 46011



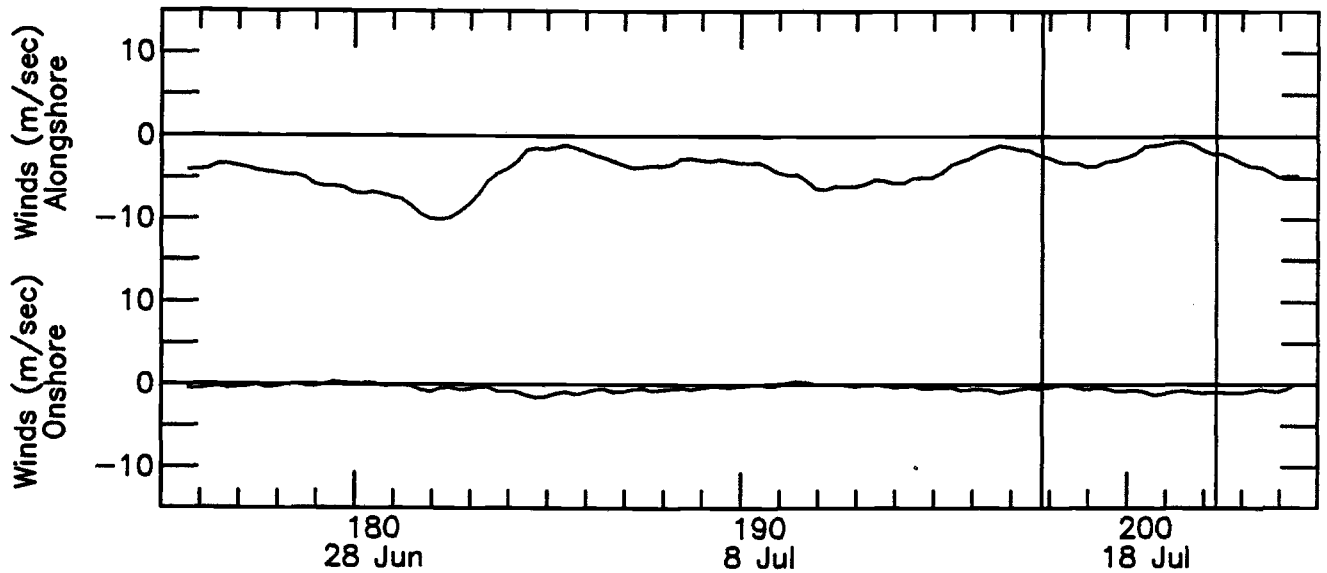
DRIFTER 17

DRIFTER 17

TIME (days)	LAT (deg N)	LON (deg W)	SPEED (km/day)
197.81	34.46	120.73	
198.43	34.49	120.87	21.82
198.65	34.52	120.93	29.89
198.85	34.56	120.94	22.55
199.38	34.63	120.98	15.22
199.62	34.68	121.01	25.31
199.81	34.71	120.98	25.80
200.39	34.74	121.00	6.55
201.66	34.92	120.84	19.14
202.34	34.85	120.78	14.75

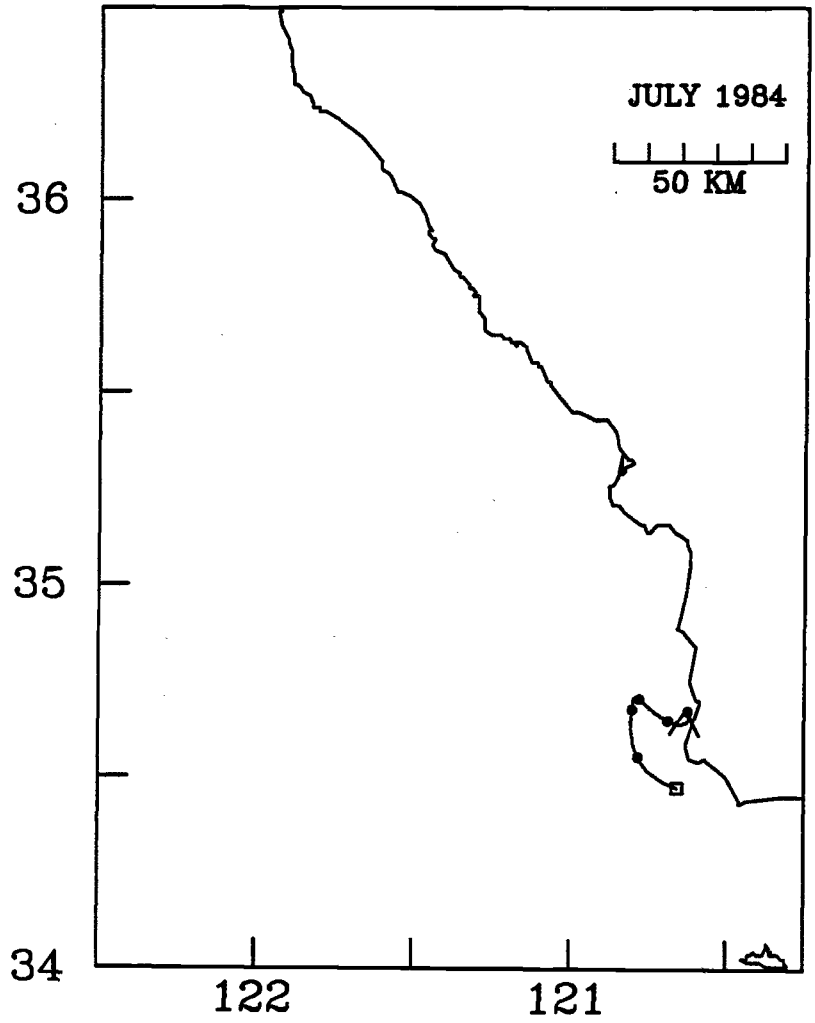


NDBC Buoy 46011

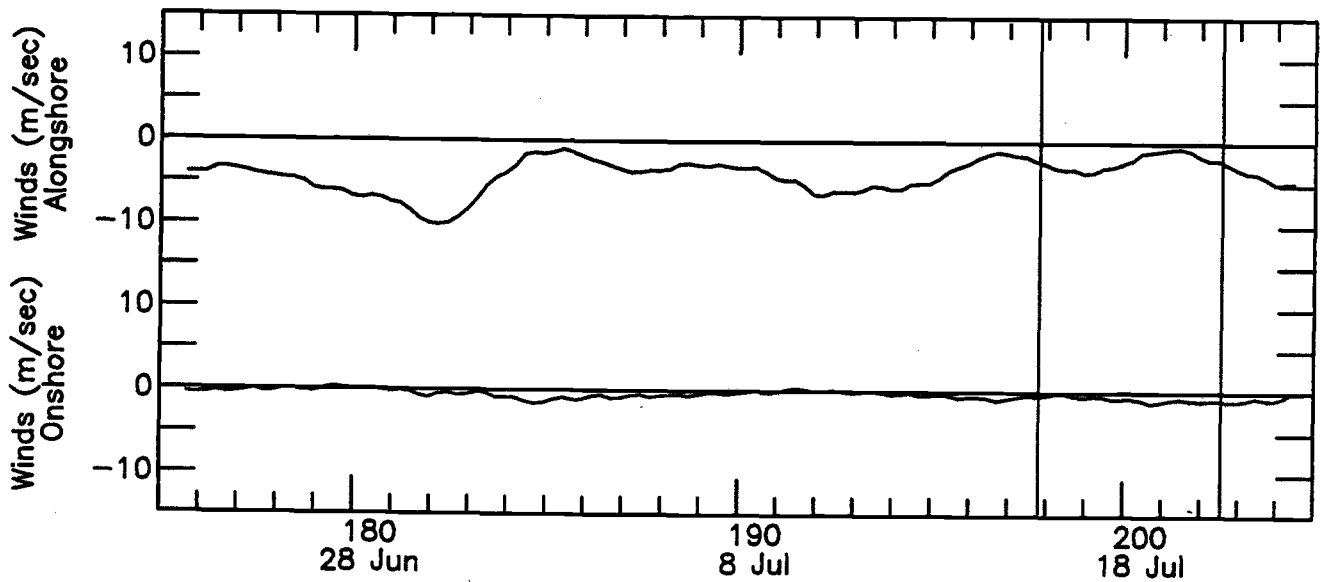


DRIFTER 18

TIME (days)	LAT (deg N)	LON (deg W)	SPEED (km/day)
197.81	34.47	120.66	
198.44	34.55	120.79	22.94
198.66	34.58	120.80	15.00
198.85	34.60	120.80	11.76
199.39	34.67	120.83	16.15
199.63	34.70	120.79	18.18
199.82	34.69	120.77	13.55
200.41	34.71	120.82	8.67
201.64	34.64	120.66	12.78
202.56	34.68	120.83	5.38



NDBC Buoy 46011

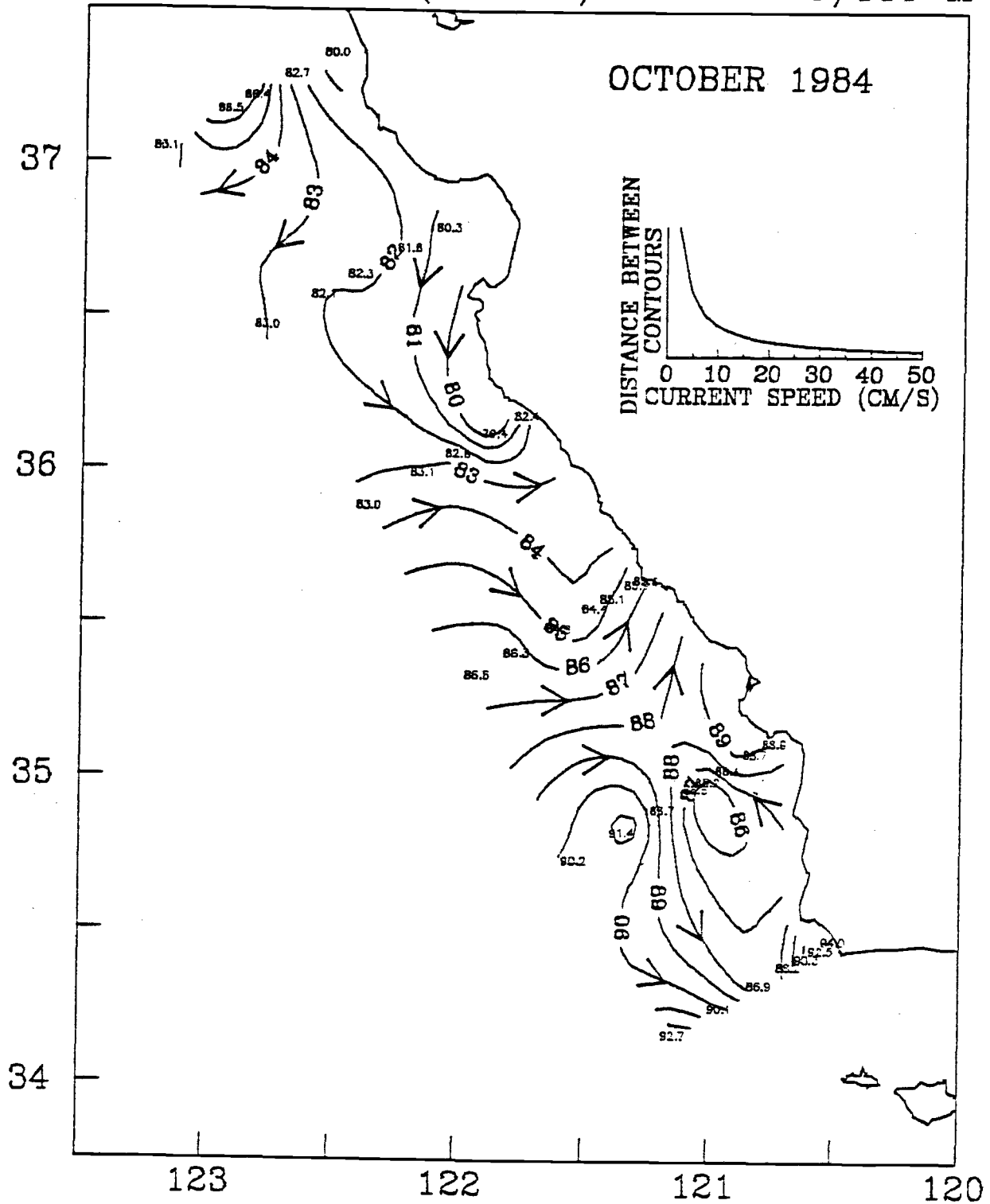


CRUISE 8404, OCTOBER 1984

DYNAMIC HEIGHT (DYN CM)

0/500 M

OCTOBER 1984



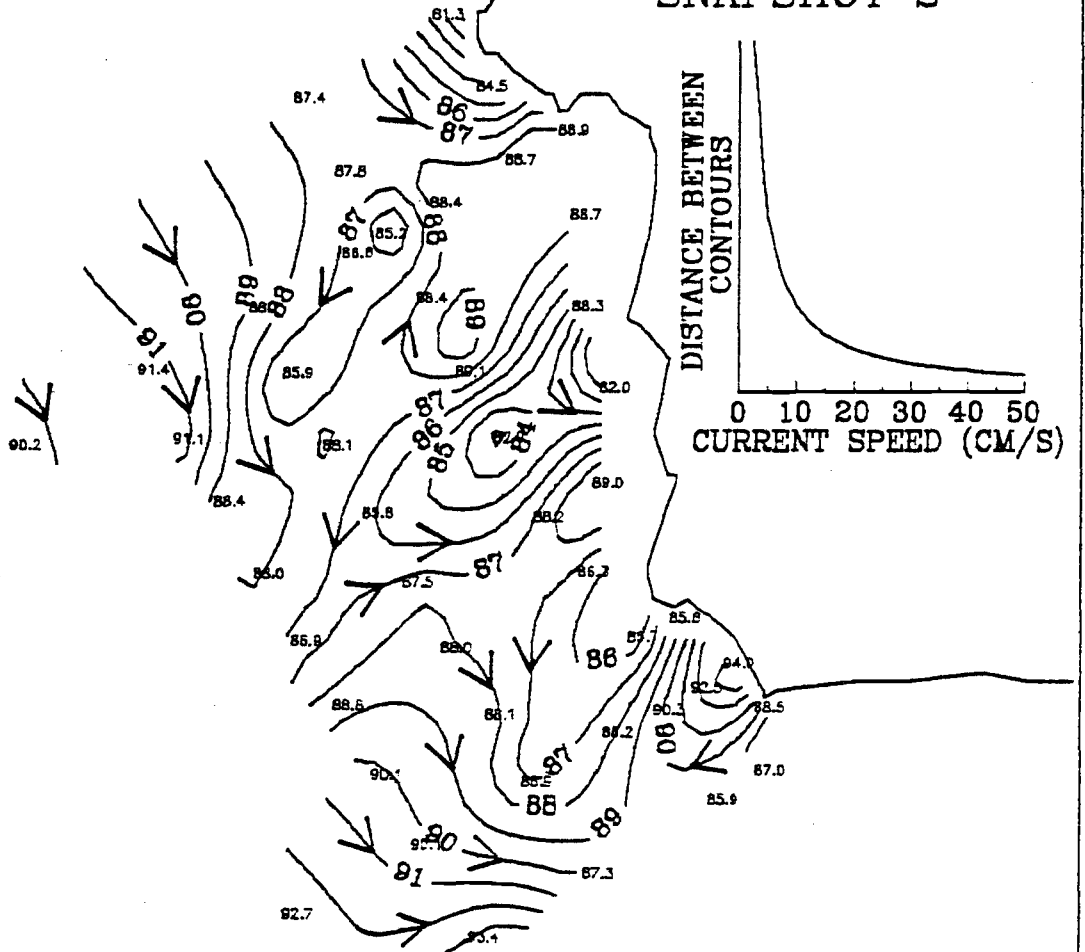
DYNAMIC HEIGHT (DYN CM)

0/500 M

OCTOBER 1984

SNAPSHOT 2

35



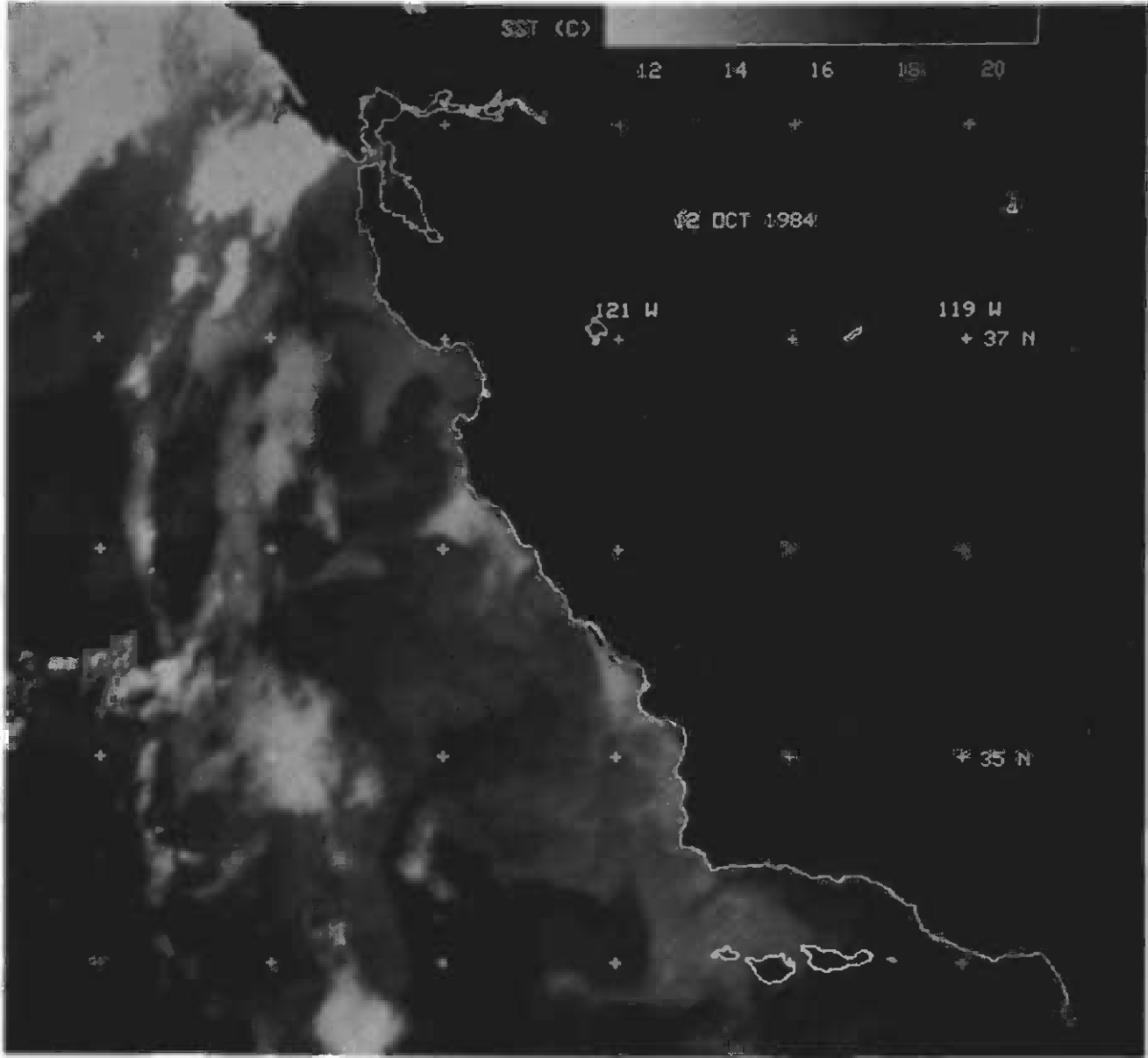
DISTANCE BETWEEN
CONTOURS

0 10 20 30 40 50
CURRENT SPEED (CM/S)

34

121

120



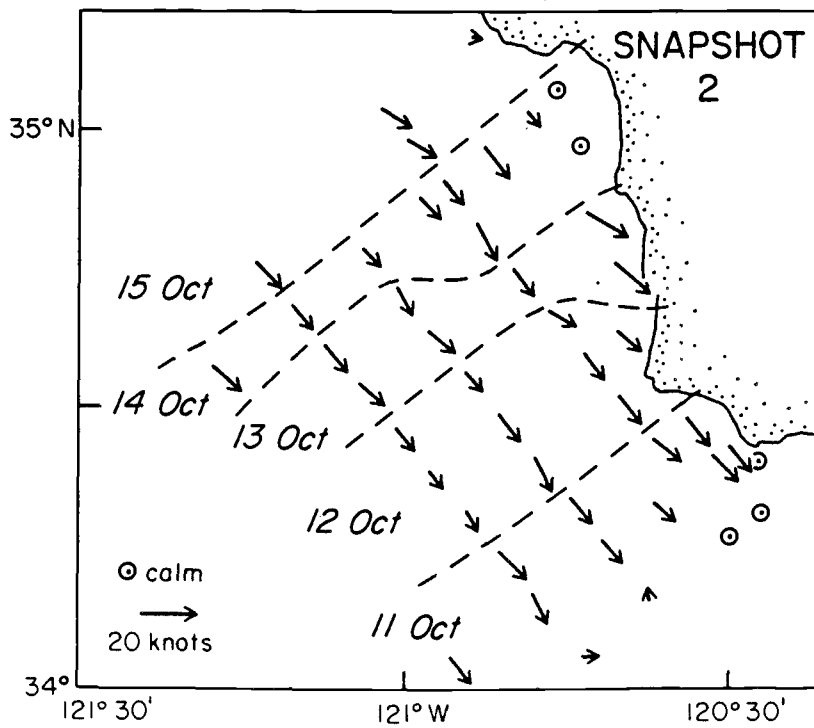
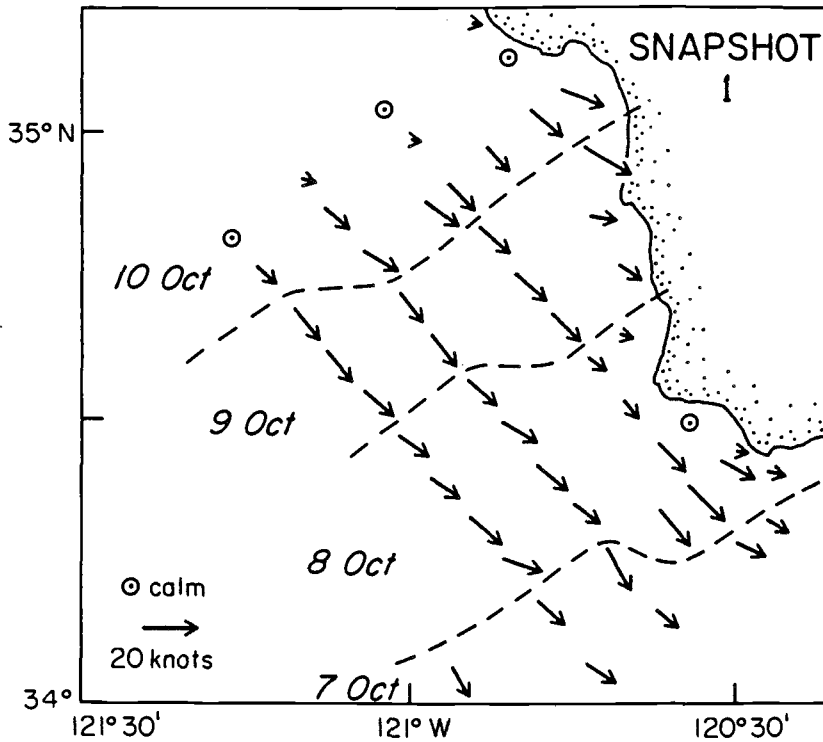
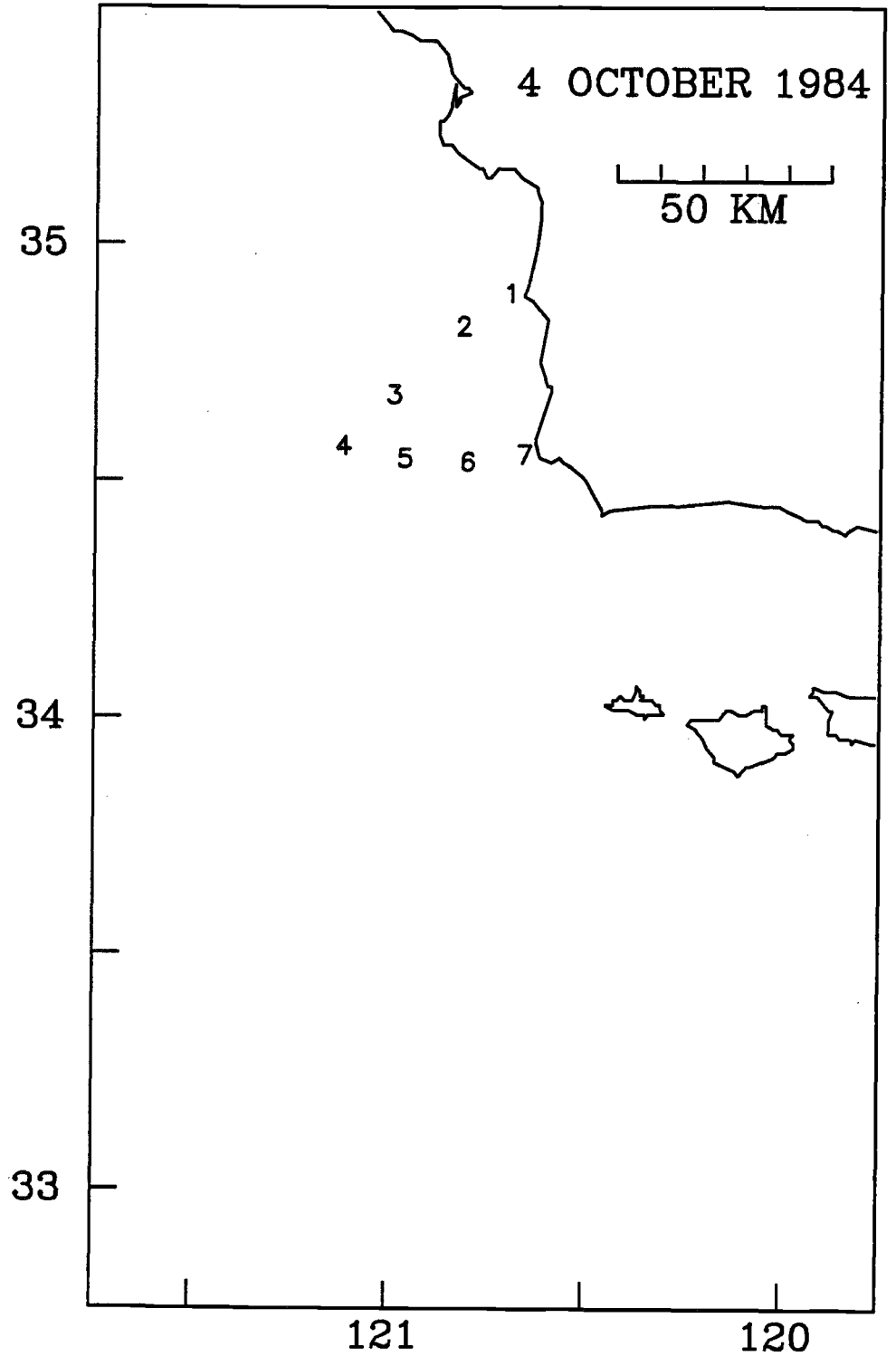


Table 3

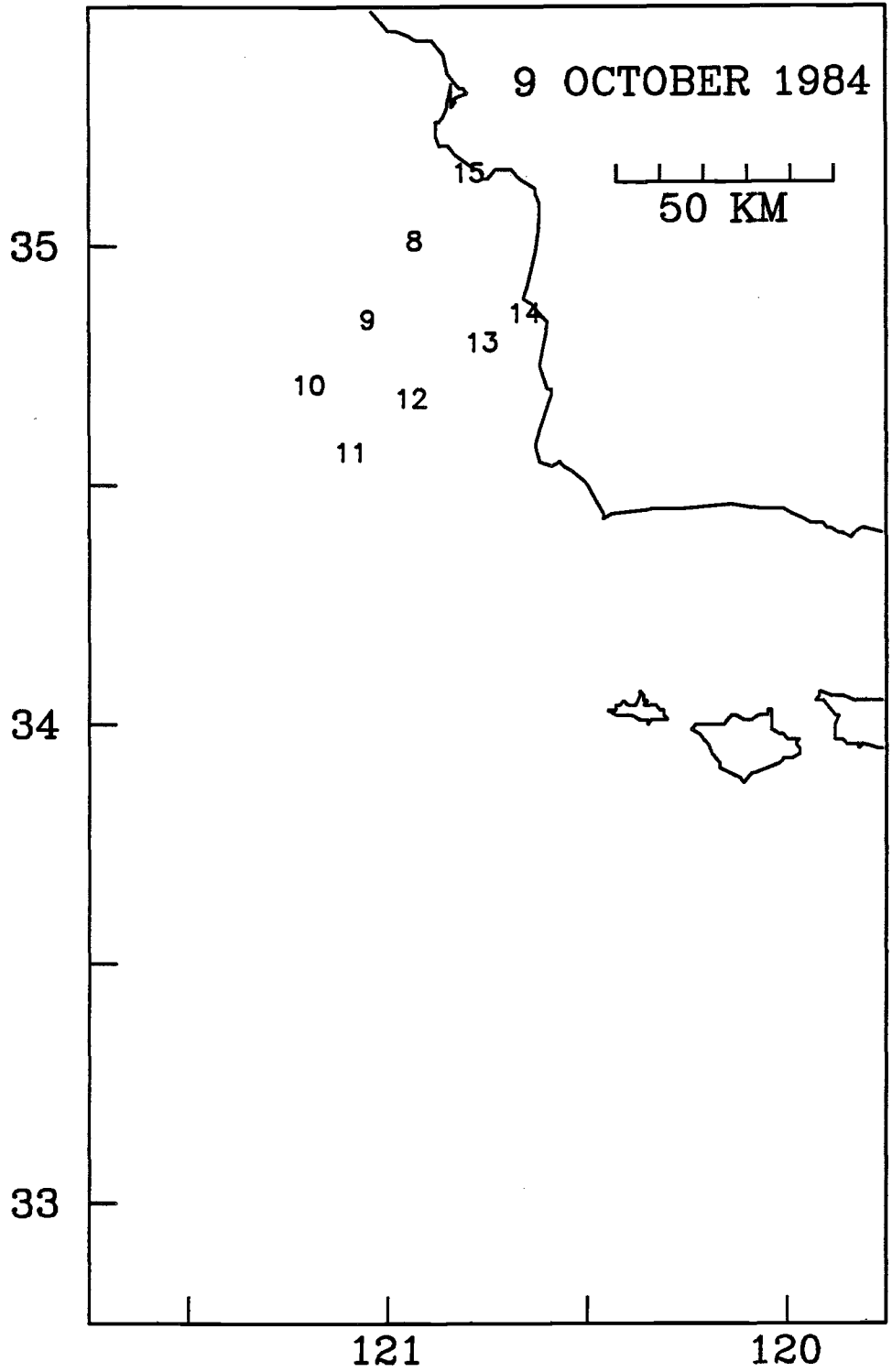
CRUISE 8404 - OCTOBER 1984

DRIFTER NUMBER	NUMBER OBS	RELEASE LAT	RELEASE LON	RELEASE TIME	LAST OBS TIME
1	18	34.88	120.71	278.51 (4 Oct.)	287.05 (13 Oct.)
2	21	34.81	120.83	278.52 (4 Oct.)	290.43 (16 Oct.)
3	18	34.66	121.01	278.52 (4 Oct.)	287.05 (13 Oct.)
4	19	34.56	121.14	278.53 (4 Oct.)	288.43 (14 Oct.)
5	18	34.53	120.98	278.53 (4 Oct.)	287.05 (13 Oct.)
6	17	34.52	120.82	278.53 (4 Oct.)	286.05 (12 Oct.)
7	12	34.54	120.68	278.54 (4 Oct.)	282.01 (8 Oct.)
8	19	34.99	120.95	283.69 (9 Oct.)	292.42 (18 Oct.)
9	18	34.83	121.07	283.70 (9 Oct.)	291.55 (17 Oct.)
10	16	34.69	121.24	283.71 (9 Oct.)	289.72 (15 Oct.)
11	15	34.55	121.14	283.72 (9 Oct.)	290.44 (16 Oct.)
12	19	34.66	120.98	283.72 (9 Oct.)	292.43 (18 Oct.)
13	13	34.78	120.81	283.72 (9 Oct.)	289.77 (15 Oct.)
14	18	34.84	120.70	283.74 (9 Oct.)	291.58 (17 Oct.)
15	13	35.14	120.84	283.69 (9 Oct.)	288.52 (14 Oct.)
16	7	35.28	120.95	287.57 (13 Oct.)	290.33 (16 Oct.)
17	9	35.16	121.08	287.57 (13 Oct.)	292.40 (18 Oct.)
18	10	35.06	120.90	287.58 (13 Oct.)	292.39 (18 Oct.)
19	10	34.97	120.95	287.58 (13 Oct.)	292.40 (18 Oct.)
20	8	34.67	121.26	287.59 (13 Oct.)	291.52 (17 Oct.)
21	8	34.33	120.42	287.66 (13 Oct.)	291.59 (17 Oct.)
22	8	34.41	120.40	287.66 (13 Oct.)	291.57 (17 Oct.)
	1	34.86	120.71	287.55 (13 Oct.)	287.55 (13 Oct.)

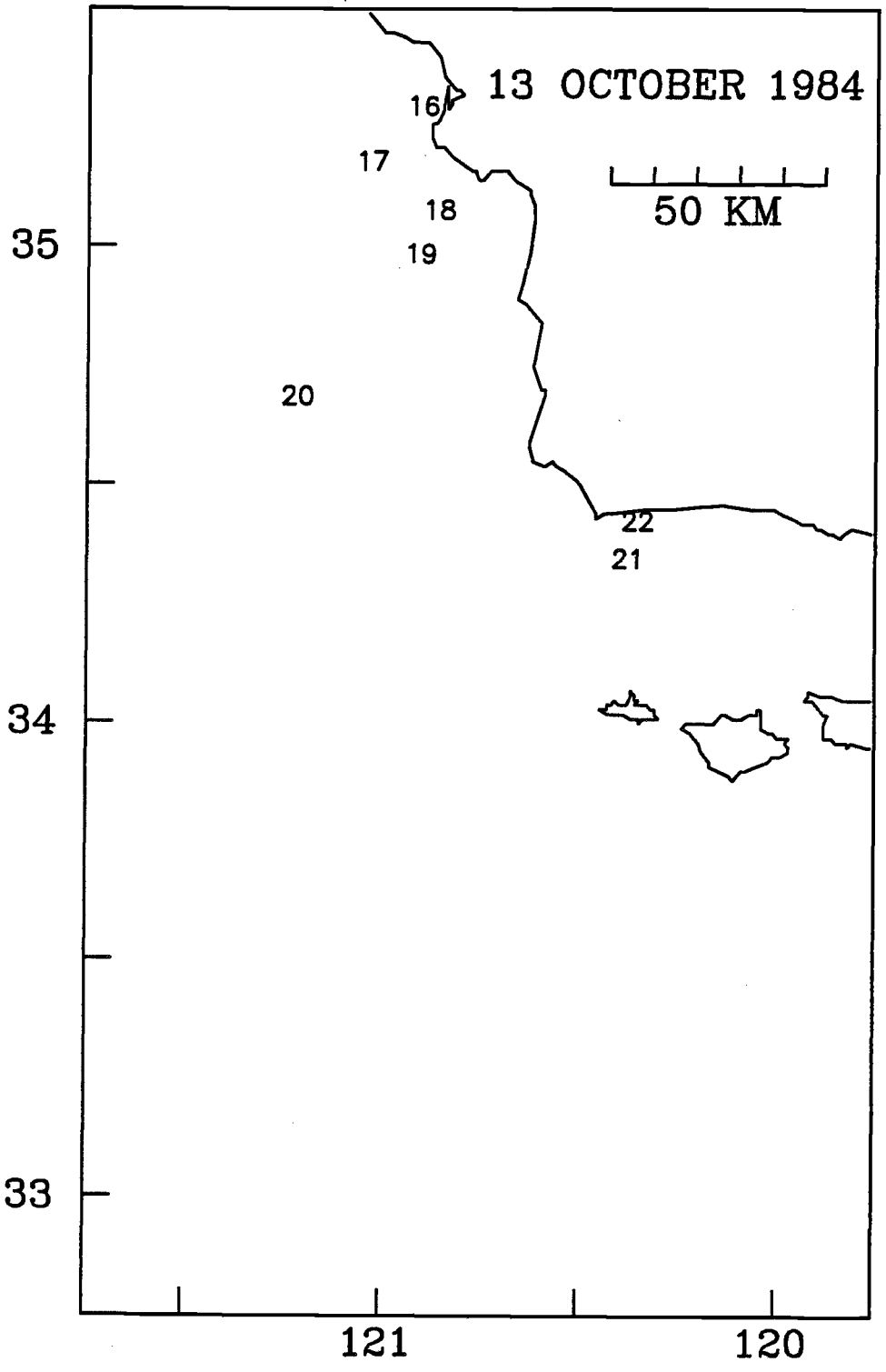
CRUISE 8404 DRIFTERS 1 - 7



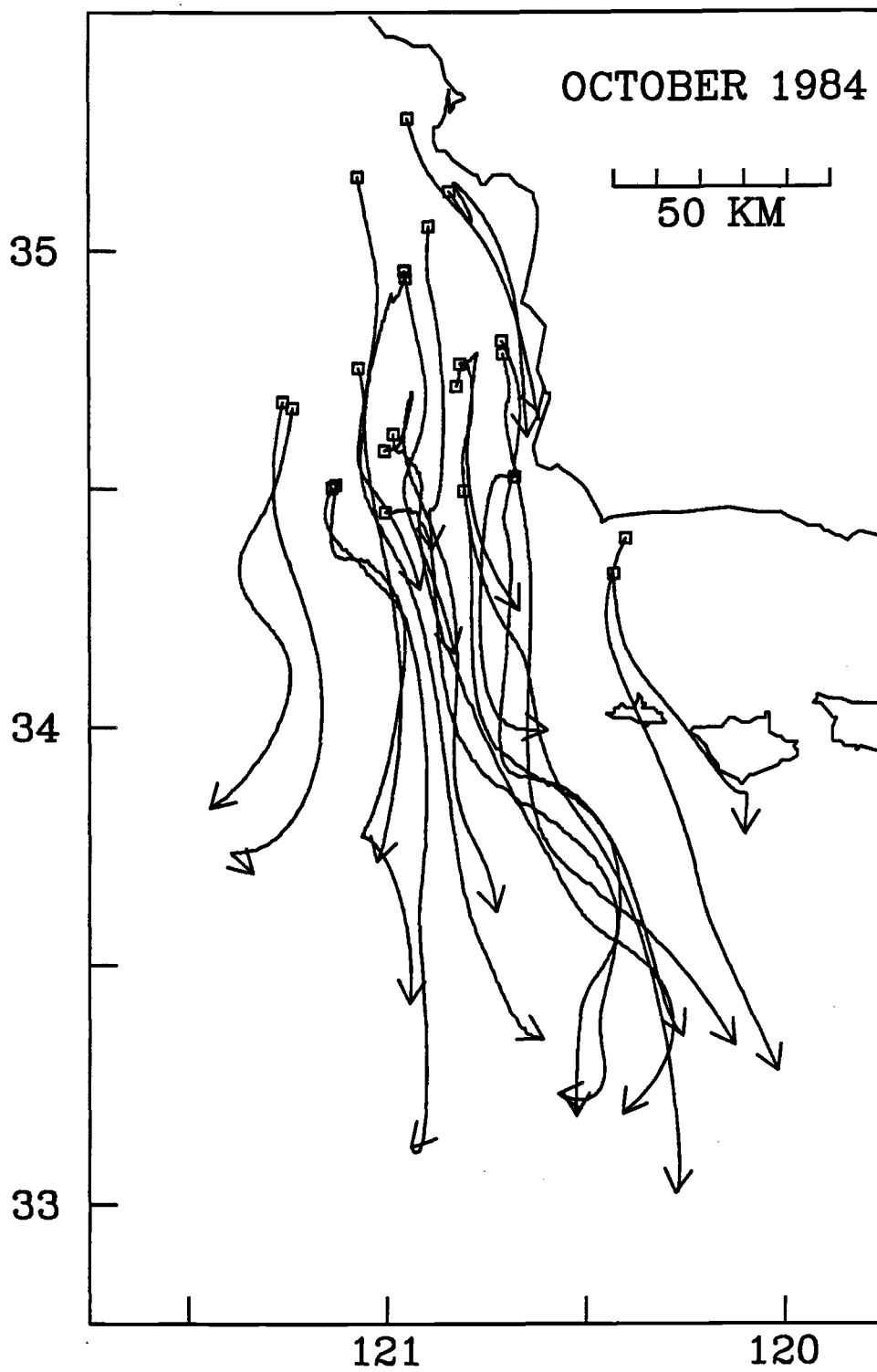
CRUISE 8404 DRIFTERS 8 - 15



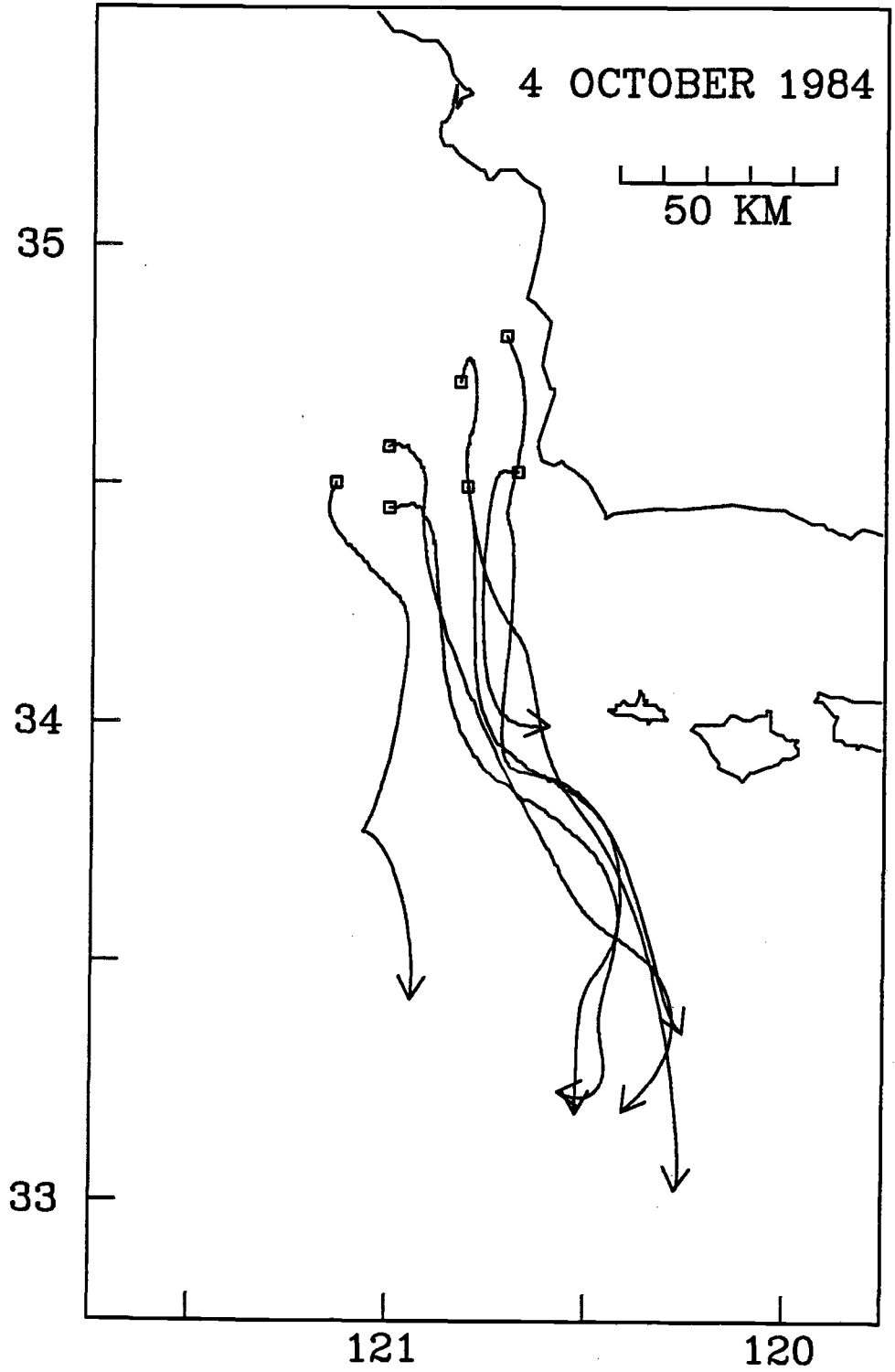
CRUISE 8404 DRIFTERS 16 - 22



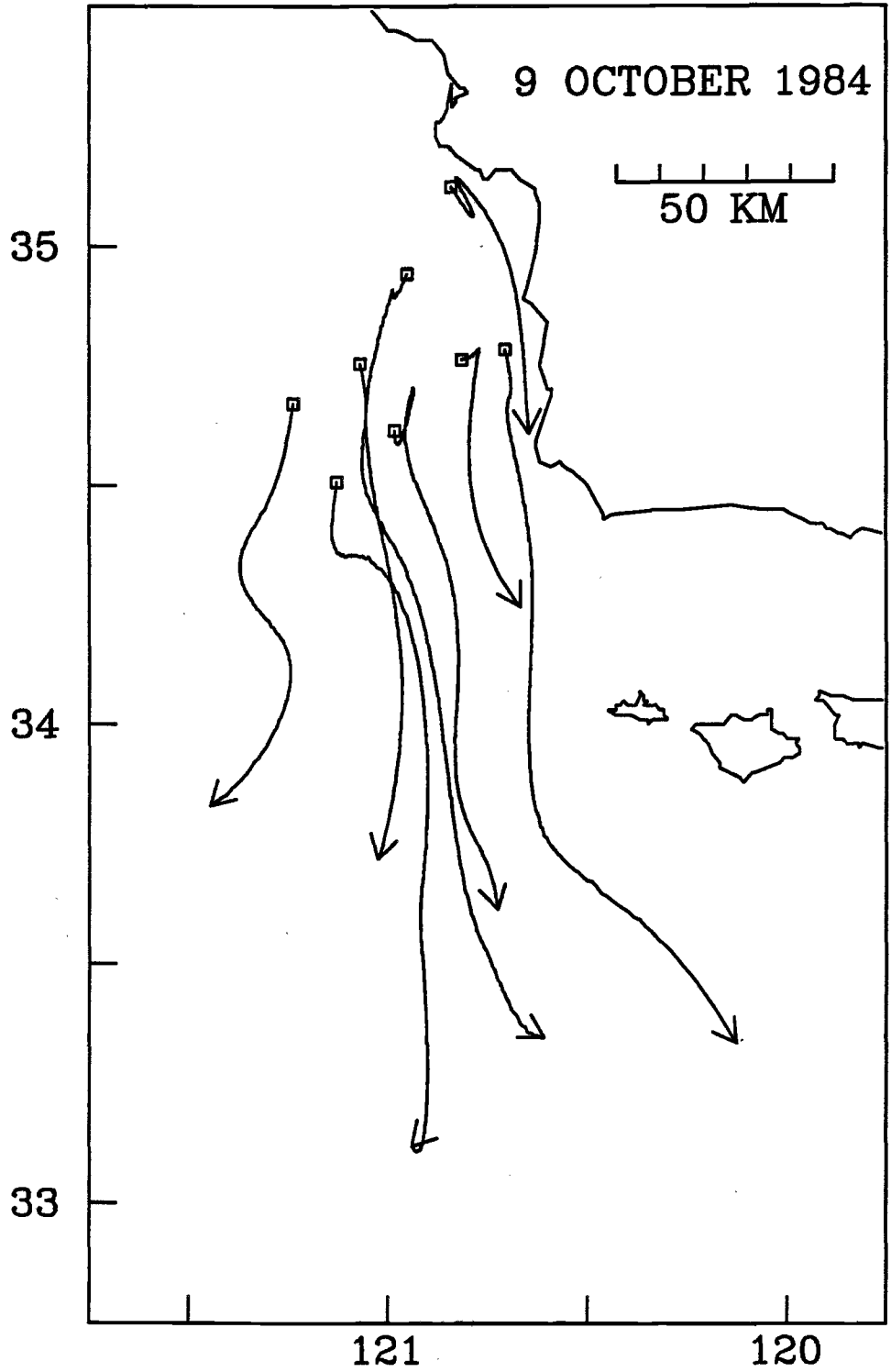
CRUISE 8404 DRIFTERS 1 - 22



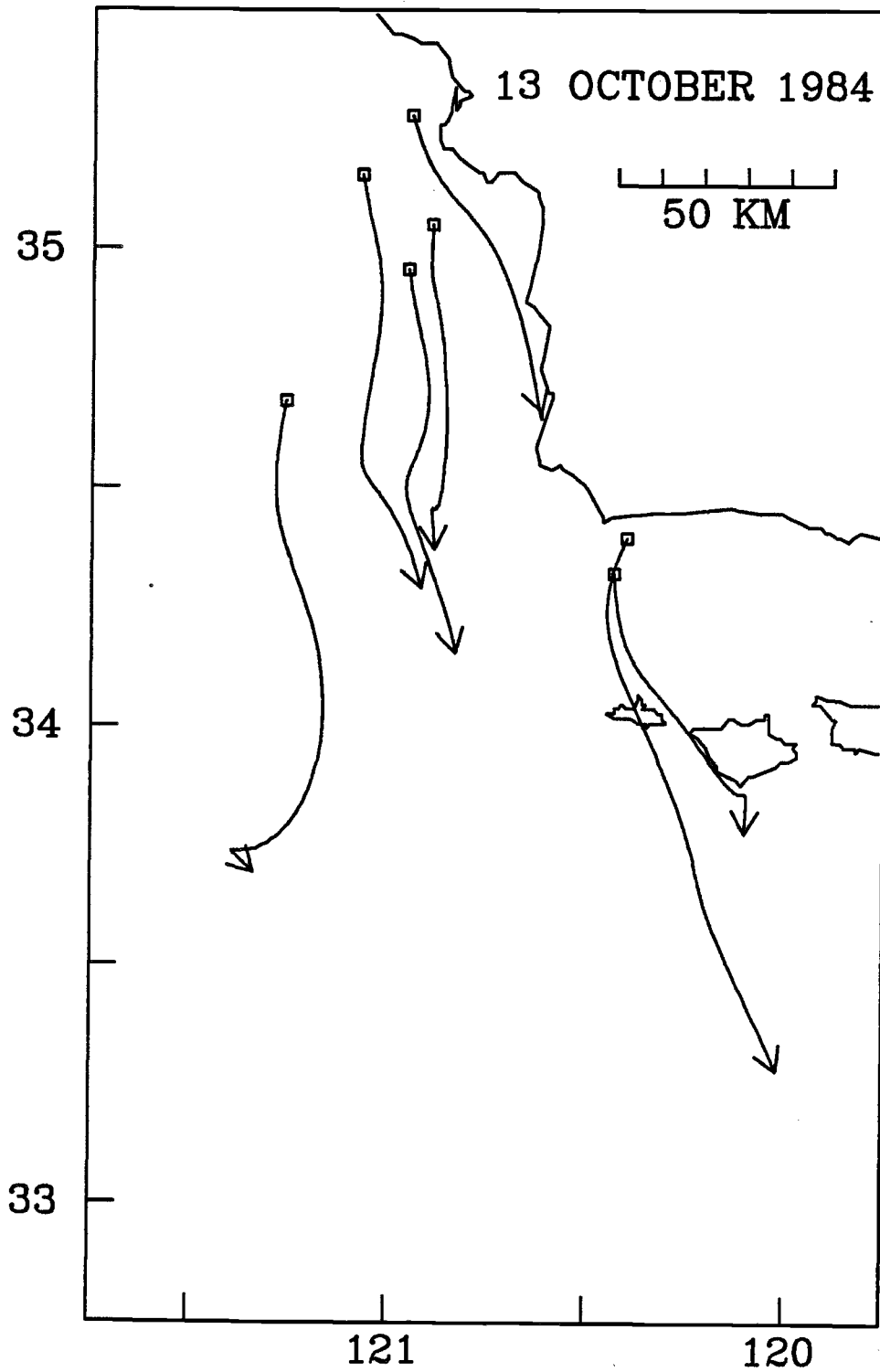
CRUISE 8404 DRIFTERS 1 - 7



CRUISE 8404 DRIFTERS 8 - 15



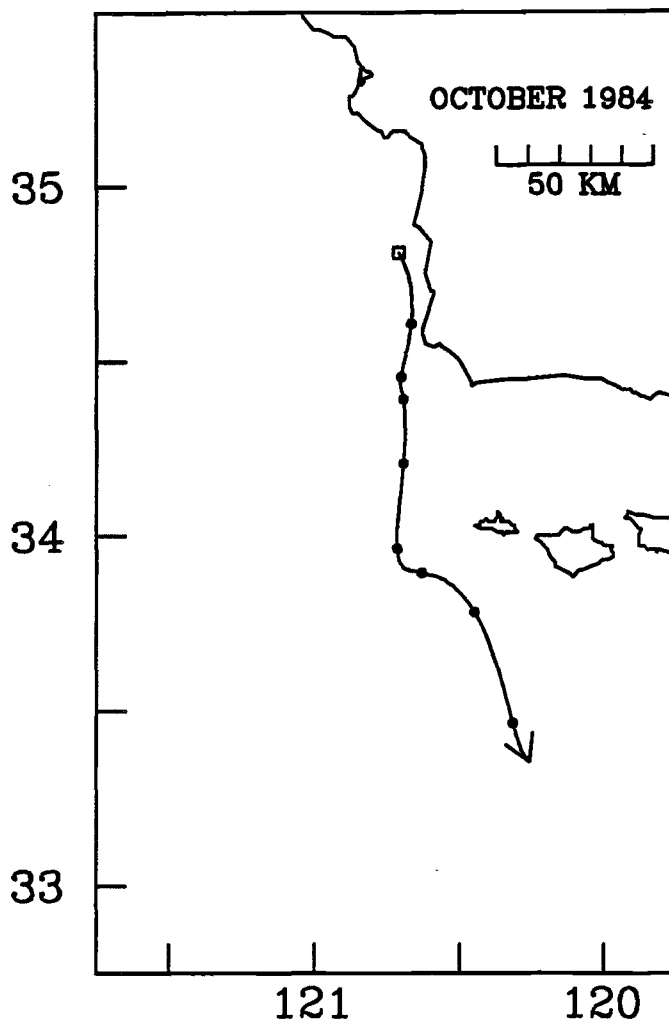
CRUISE 8404 DRIFTERS 16 - 22



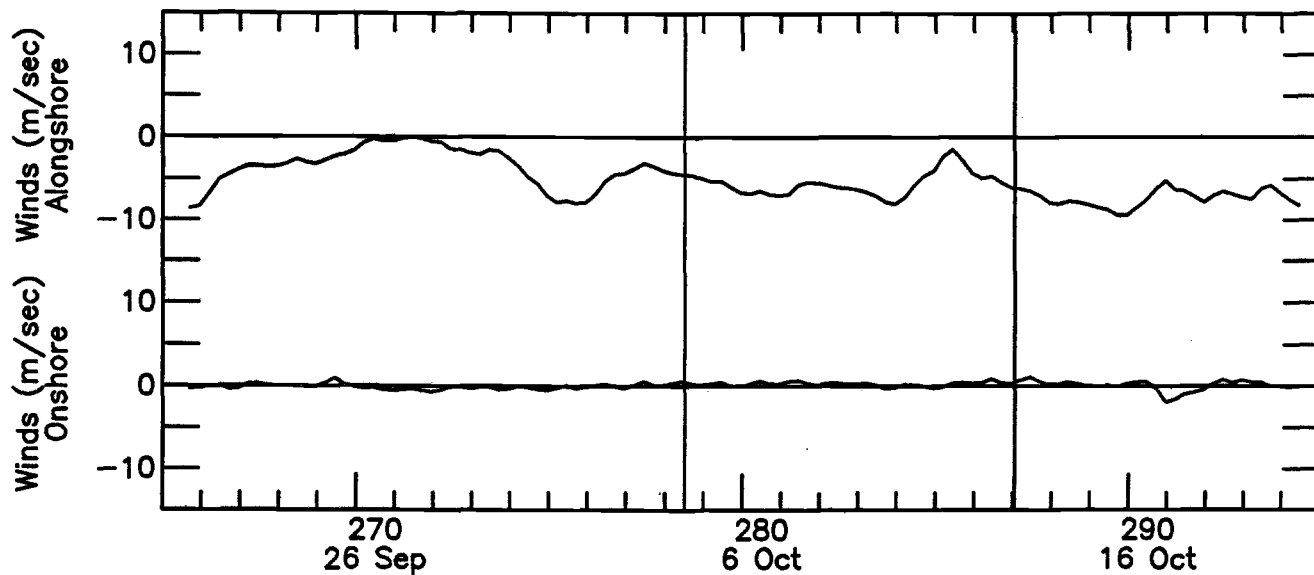
DRIFTER 1

DRIFTER 1

TIME (days)	LAT (deg N)	LON (deg W)	SPEED (km/day)
278.52	34.88	120.71	
278.68	34.83	120.68	38.22
279.00	34.75	120.68	26.36
279.44	34.70	120.69	13.18
279.66	34.67	120.67	19.70
280.01	34.57	120.67	31.44
280.38	34.52	120.70	17.06
280.71	34.50	120.69	4.75
281.01	34.48	120.72	12.83
281.44	34.47	120.73	3.81
281.72	34.42	120.68	24.84
282.02	34.34	120.69	29.00
282.65	34.19	120.68	27.33
283.01	34.10	120.69	28.91
284.05	33.91	120.75	20.46
285.06	33.86	120.48	24.93
286.06	33.61	120.39	29.11
287.05	33.35	120.25	31.49



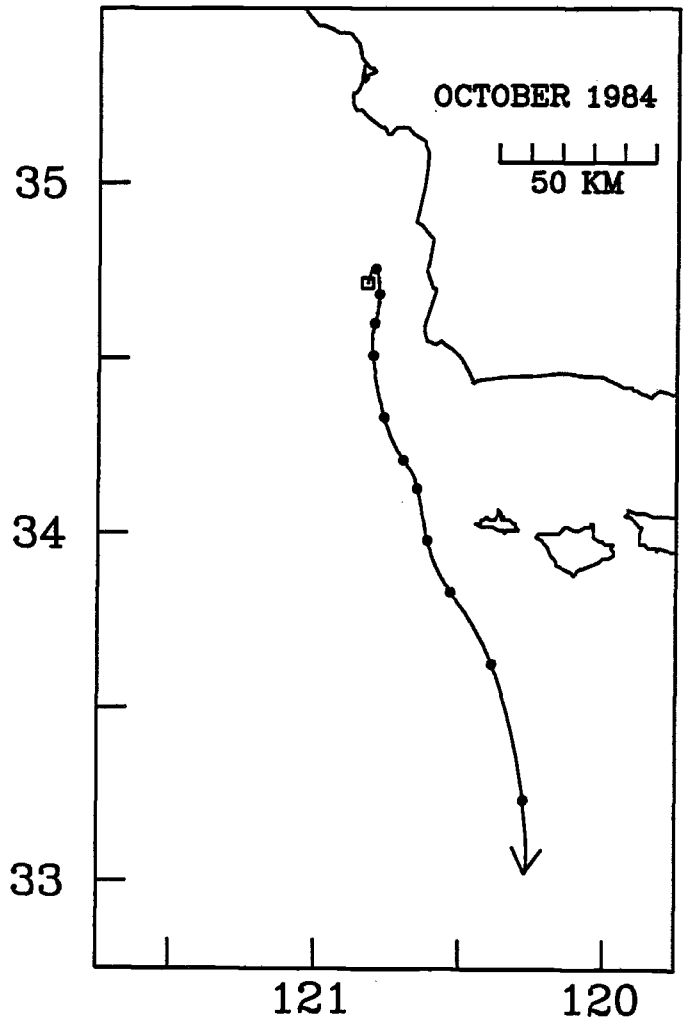
NDBC Buoy 46011



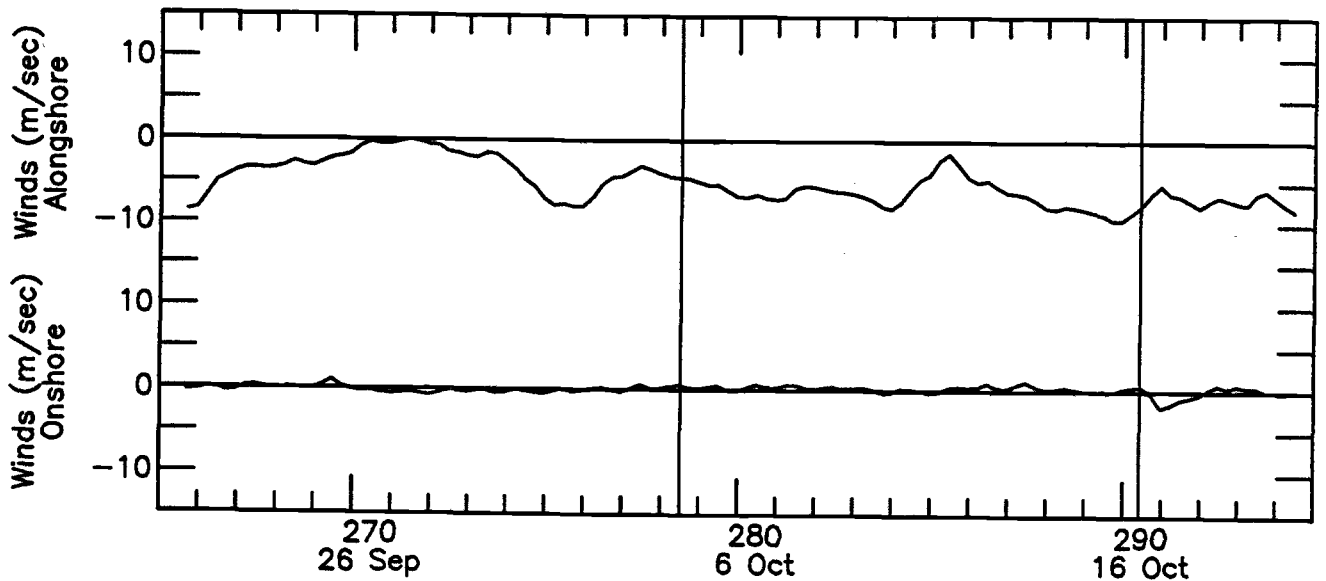
DRIFTER 2

TIME (days)	LAT (deg N)	LON (deg W)	SPEED (km/day)
278.52	34.81	120.83	
278.69	34.83	120.82	13.58
279.01	34.85	120.79	11.95
279.40	34.88	120.83	15.13
279.67	34.89	120.79	13.73
279.97	34.81	120.78	27.67
280.35	34.81	120.82	10.76
280.66	34.80	120.77	15.98
280.97	34.75	120.74	21.27
281.40	34.69	120.81	19.22
281.66	34.69	120.84	12.36
281.97	34.66	120.83	9.68
282.58	34.58	120.78	16.43
282.97	34.48	120.79	29.60
284.01	34.29	120.75	21.13
285.02	34.19	120.67	12.71
286.02	34.06	120.62	15.33
287.02	33.89	120.59	18.30
288.44	33.64	120.39	23.62
289.45	33.25	120.29	43.88
290.43	33.02	120.28	26.10

DRIFTER 2



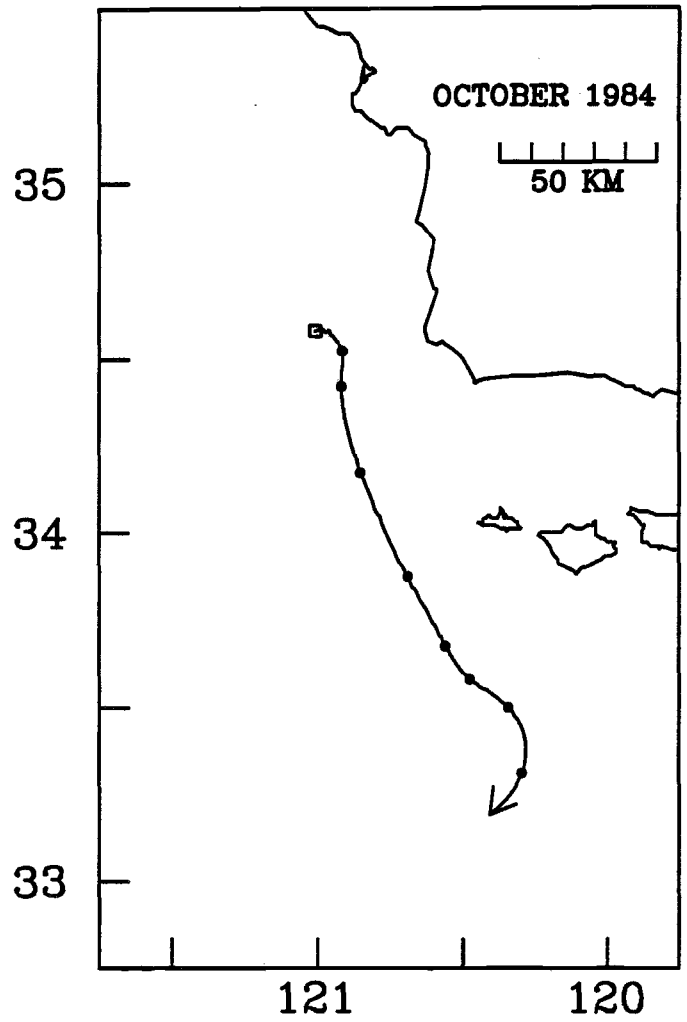
NDBC Buoy 46011



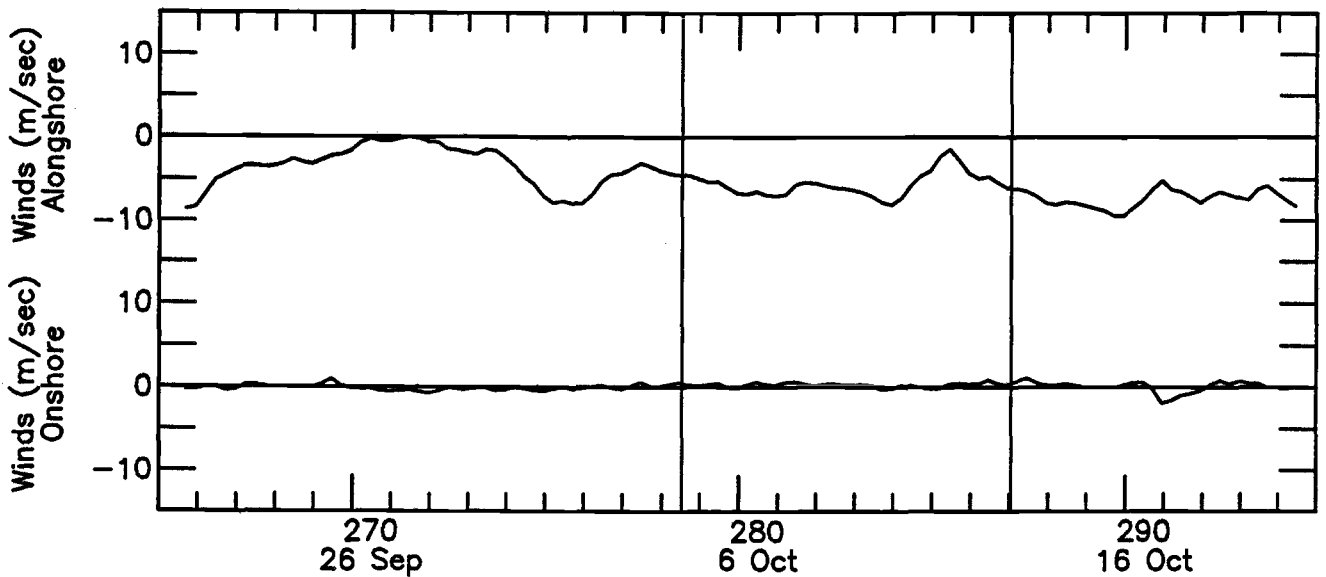
DRIFTER 3

TIME (days)	LAT (deg N)	LON (deg W)	SPEED (km/day)
278.52	34.66	121.01	
278.70	34.67	120.97	21.60
279.01	34.64	120.96	10.60
279.41	34.64	120.92	7.85
279.68	34.61	120.91	12.79
279.97	34.55	120.91	21.76
280.36	34.49	120.93	17.23
280.67	34.47	120.92	7.35
280.97	34.41	120.91	23.57
281.41	34.29	120.83	33.71
281.71	34.15	120.81	52.91
282.02	34.01	120.85	52.98
282.60	33.89	120.67	36.21
282.99	33.79	120.58	36.61
284.03	33.60	120.54	19.68
285.04	33.54	120.41	13.69
286.04	33.40	120.28	19.57
287.05	33.17	120.43	28.64

DRIFTER 3

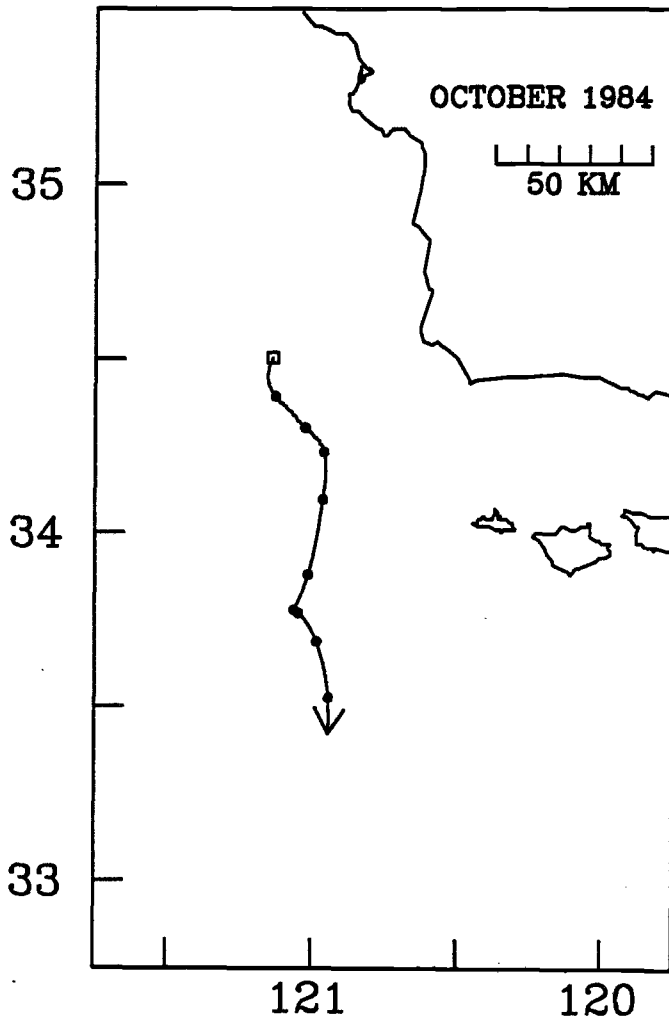


NDBC Buoy 46011

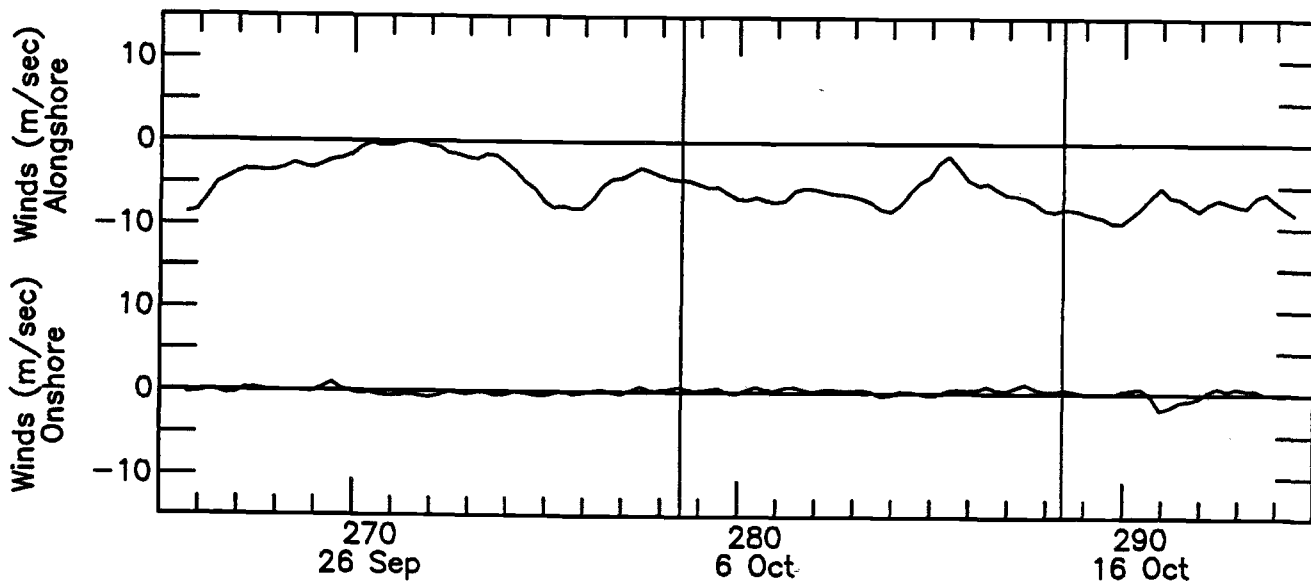


DRIFTER 4

TIME (days)	LAT (deg N)	LON (deg W)	SPEED (km/day)
278.53	34.56	121.14	
278.70	34.51	121.14	30.90
279.02	34.49	121.17	9.39
279.41	34.45	121.15	10.46
279.68	34.43	121.10	19.82
279.98	34.41	121.08	10.40
280.36	34.38	121.03	14.65
280.67	34.34	120.97	21.53
280.98	34.30	121.01	19.32
281.41	34.29	120.99	6.17
281.67	34.27	120.96	13.65
281.98	34.23	120.96	14.78
282.59	34.11	120.93	22.70
282.98	33.99	120.99	35.93
284.02	33.83	121.06	18.56
285.03	33.77	121.05	6.77
286.03	33.74	121.02	3.96
287.03	33.60	120.96	16.50
288.43	33.42	120.94	14.47



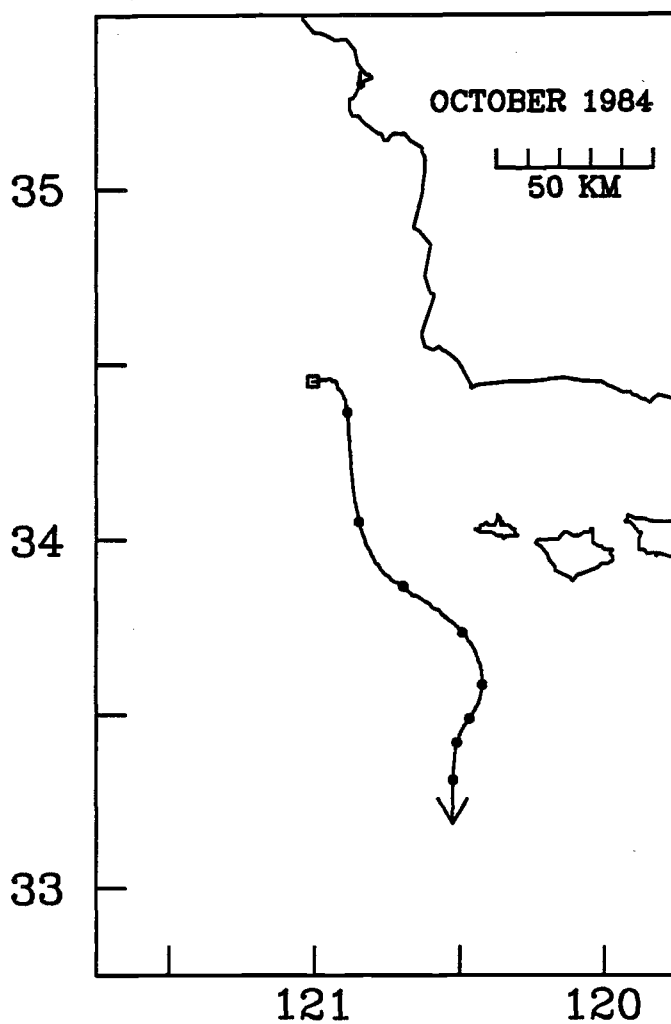
NDBC Buoy 46011



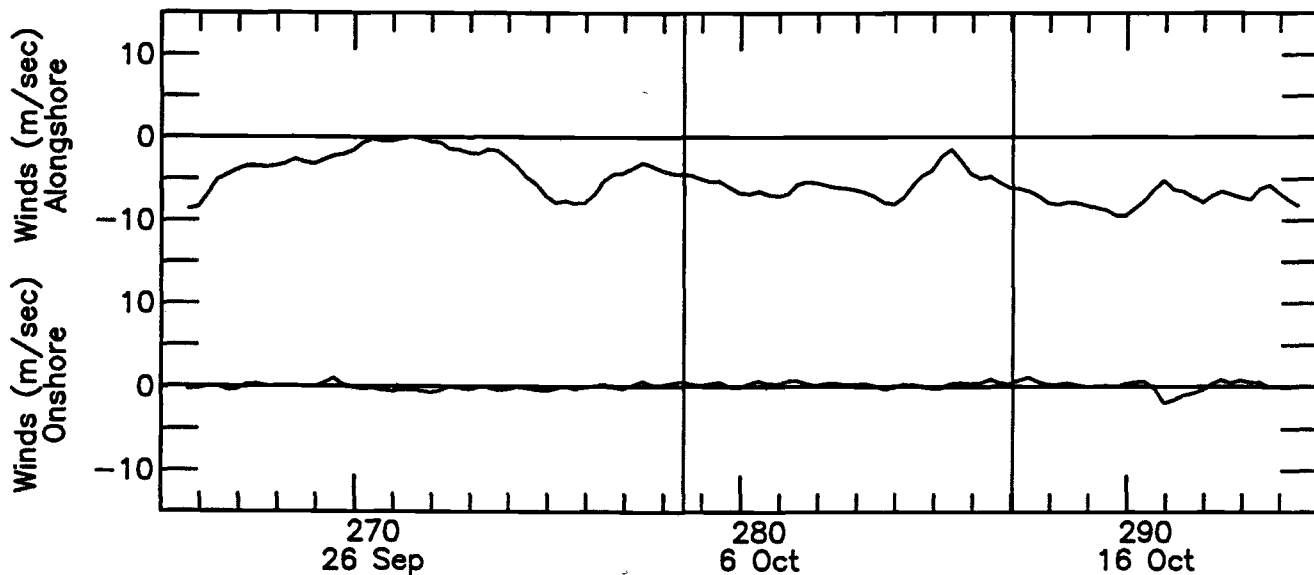
DRIFTER 5

DRIFTER 5

TIME (days)	LAT (deg N)	LON (deg W)	SPEED (km/day)
278.53	34.53	120.98	
278.72	34.51	120.96	16.27
279.03	34.49	120.98	7.50
279.42	34.46	120.90	18.54
279.69	34.38	120.84	40.39
279.98	34.27	120.82	42.51
280.36	34.13	120.87	41.59
280.68	34.06	120.88	25.04
280.98	33.99	120.82	31.53
281.42	33.88	120.74	33.39
281.68	33.88	120.62	42.61
281.99	33.85	120.54	25.68
282.61	33.72	120.49	24.67
282.99	33.65	120.47	20.18
284.03	33.53	120.43	13.10
285.05	33.43	120.49	12.29
286.05	33.37	120.52	7.70
287.05	33.16	120.52	22.80



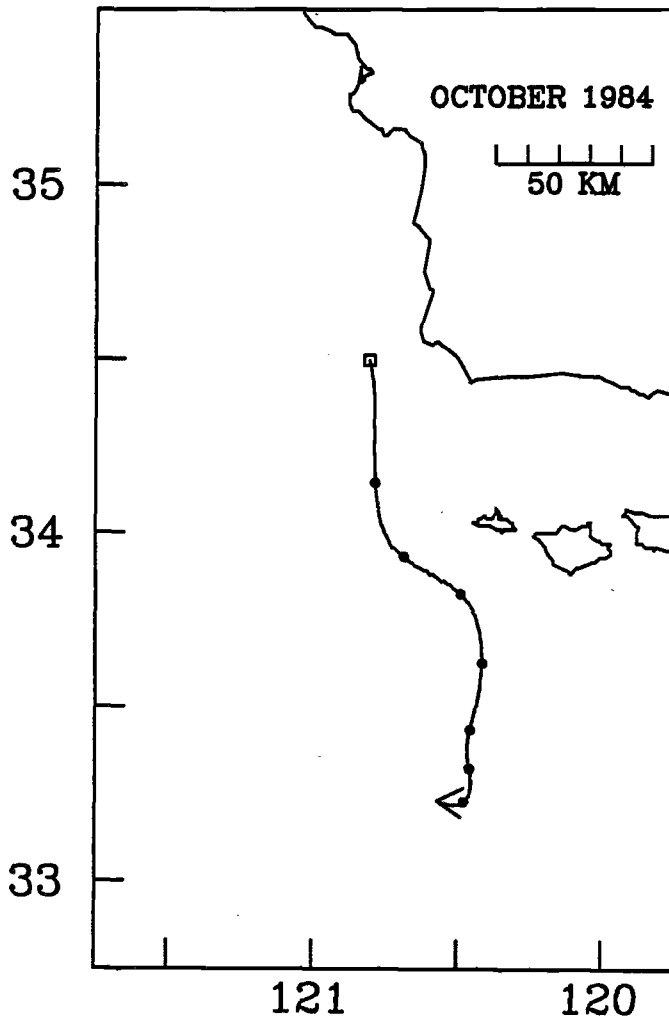
NDBC Buoy 46011



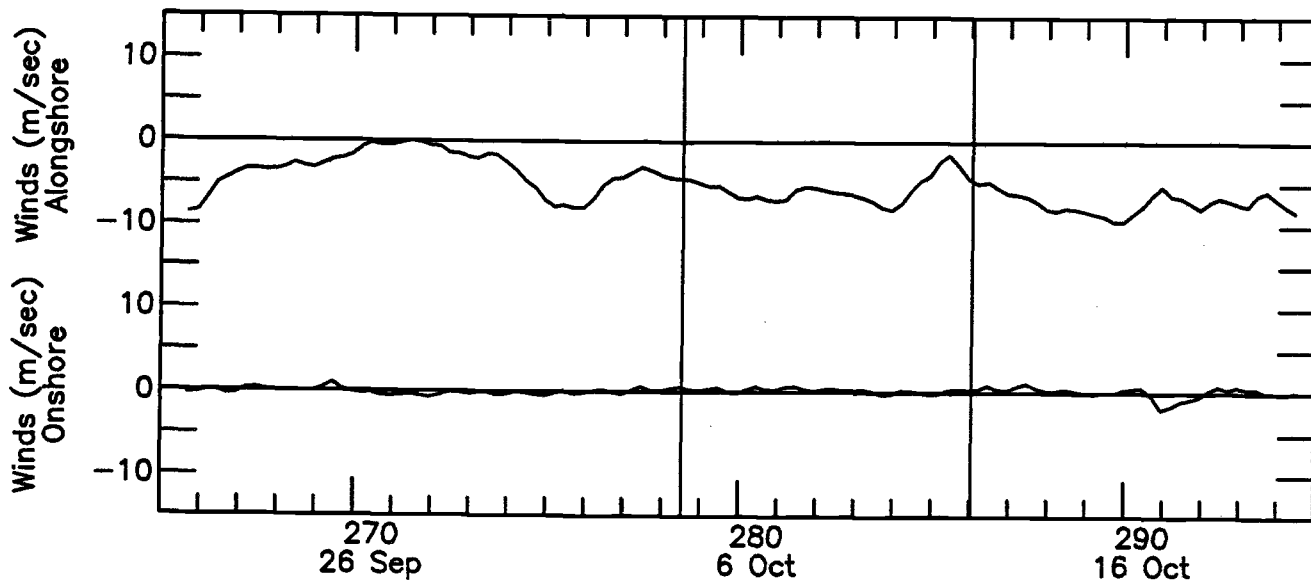
DRIFTER 6

DRIFTER 6

TIME (days)	LAT (deg N)	LON (deg W)	SPEED (km/day)
278.53	34.52	120.82	
278.73	34.49	120.79	26.80
279.03	34.36	120.76	47.13
279.43	34.22	120.79	39.32
279.70	34.13	120.78	37.39
279.99	34.06	120.76	29.54
280.37	33.98	120.76	21.90
280.68	33.95	120.65	35.39
280.99	33.92	120.58	29.11
281.43	33.84	120.50	22.74
281.69	33.82	120.46	18.36
281.99	33.75	120.43	25.20
282.61	33.62	120.44	24.21
282.99	33.50	120.42	33.29
284.03	33.37	120.46	14.97
285.05	33.28	120.46	11.91
286.05	33.23	120.57	11.17



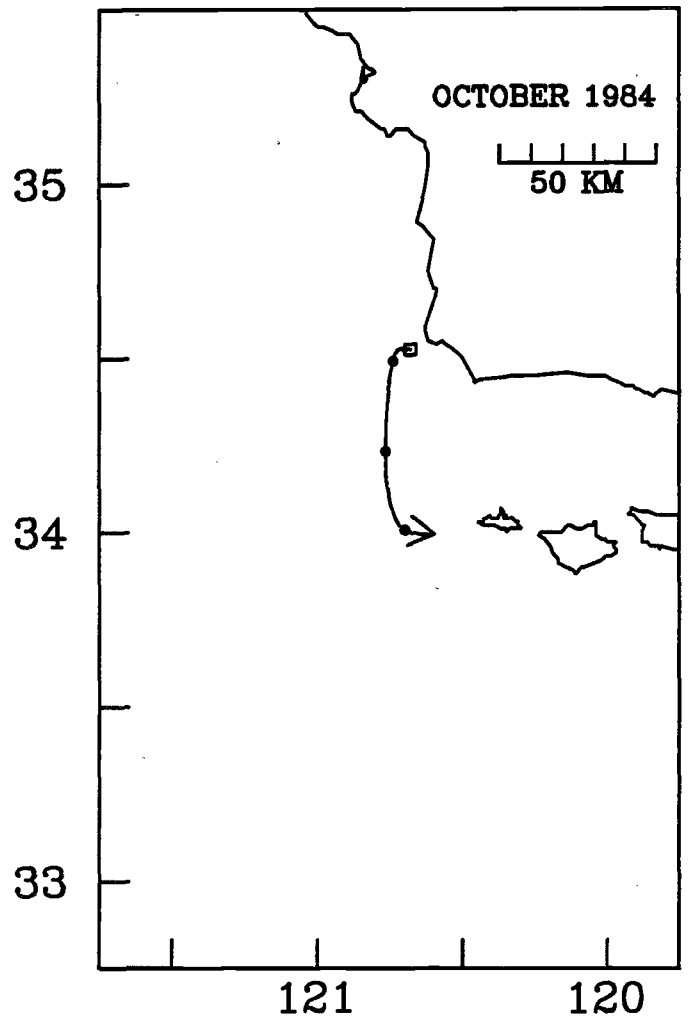
NDBC Buoy 46011



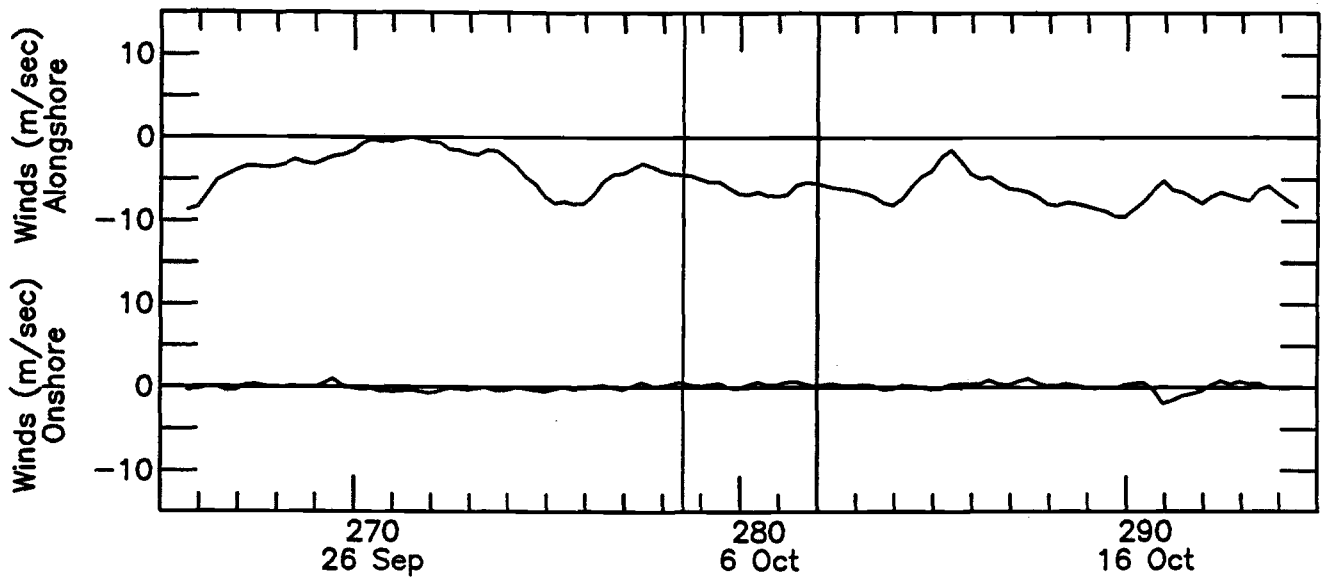
DRIFTER 7

TIME (days)	LAT (deg N)	Lon (deg W)	SPEED (km/day)
278.54	34.54	120.68	
278.73	34.55	120.70	10.94
279.04	34.54	120.73	9.54
279.43	34.51	120.75	11.13
279.71	34.47	120.74	15.15
280.00	34.41	120.75	24.74
280.38	34.29	120.76	35.12
280.70	34.17	120.76	40.40
281.00	34.08	120.78	33.39
281.43	34.00	120.71	24.09
281.71	34.01	120.64	22.86
282.01	33.98	120.61	18.17

DRIFTER 7



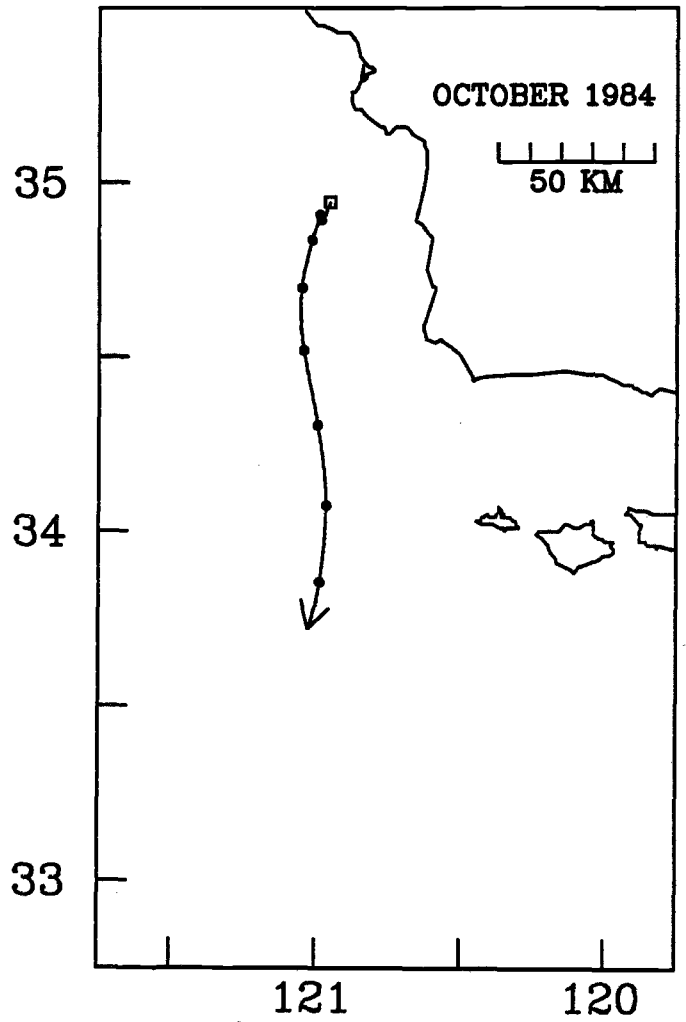
NDBC Buoy 46011



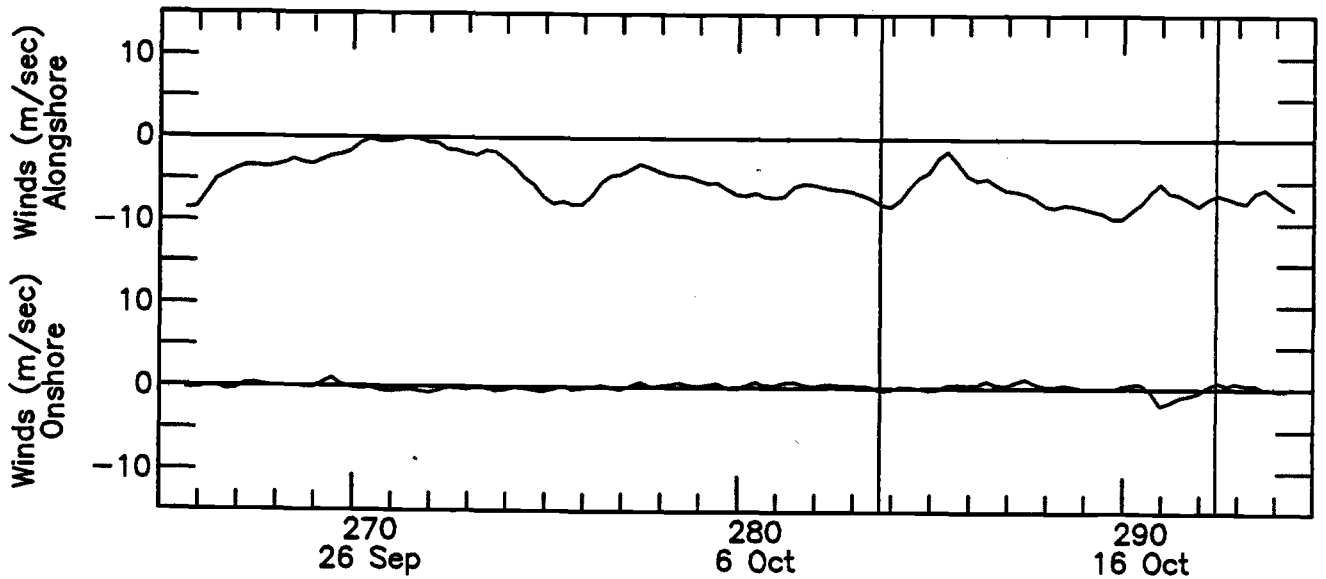
DRIFTER 8

TIME (days)	LAT (deg N)	LON (deg W)	SPEED (km/day)
283.89	34.99	120.96	
283.97	34.97	120.97	11.71
284.40	34.97	120.99	4.39
284.66	34.96	120.98	5.87
284.96	34.97	120.98	4.38
285.55	34.99	121.00	5.76
285.96	34.93	120.99	17.50
286.39	34.90	121.01	9.62
286.69	34.87	121.02	9.63
286.98	34.81	121.02	24.47
287.59	34.73	121.06	15.23
287.98	34.81	121.05	35.34
288.39	34.55	121.06	17.04
288.75	34.50	121.02	19.09
289.50	34.29	121.01	30.19
289.70	34.24	120.98	35.02
290.36	34.10	120.97	23.42
291.50	33.84	120.99	25.09
292.42	33.71	121.03	16.41

DRIFTER 8



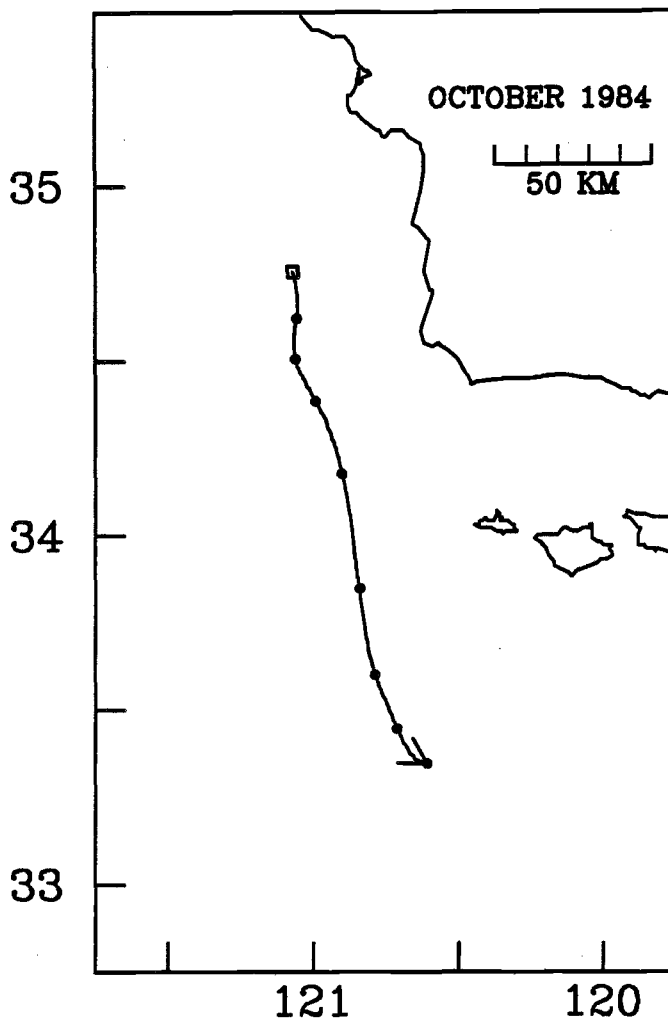
NDBC Buoy 46011



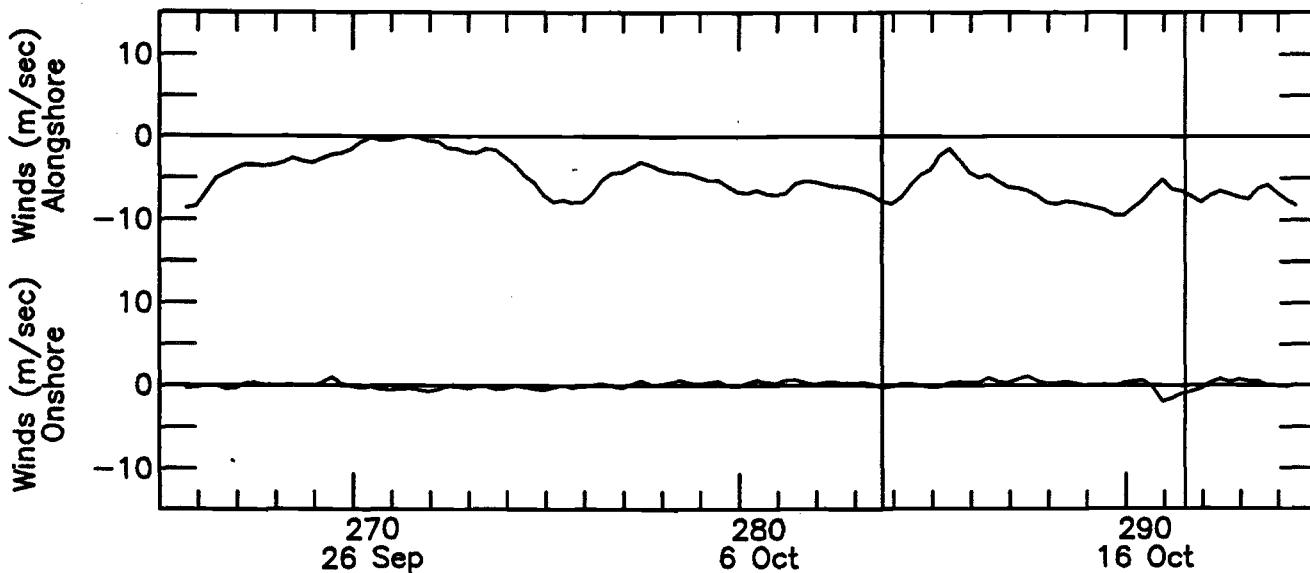
DRIFTER 9

TIME (days)	LAT (deg N)	LOX (deg W)	SPEED (km/day)
283.70	34.83	121.07	
283.98	34.76	121.06	29.32
284.42	34.70	121.07	13.41
284.67	34.68	121.05	13.39
284.98	34.66	121.05	6.83
285.56	34.59	121.07	13.12
285.97	34.49	121.05	26.89
286.40	34.44	121.01	17.52
286.74	34.40	120.97	15.56
287.08	34.31	120.94	29.53
287.62	34.17	120.88	30.45
288.00	33.98	120.84	56.48
288.41	33.85	120.86	37.18
288.77	33.75	120.85	32.41
289.43	33.59	120.79	27.38
289.73	33.52	120.74	30.85
290.45	33.42	120.74	14.77
291.55	33.33	120.60	15.35

DRIFTER 9



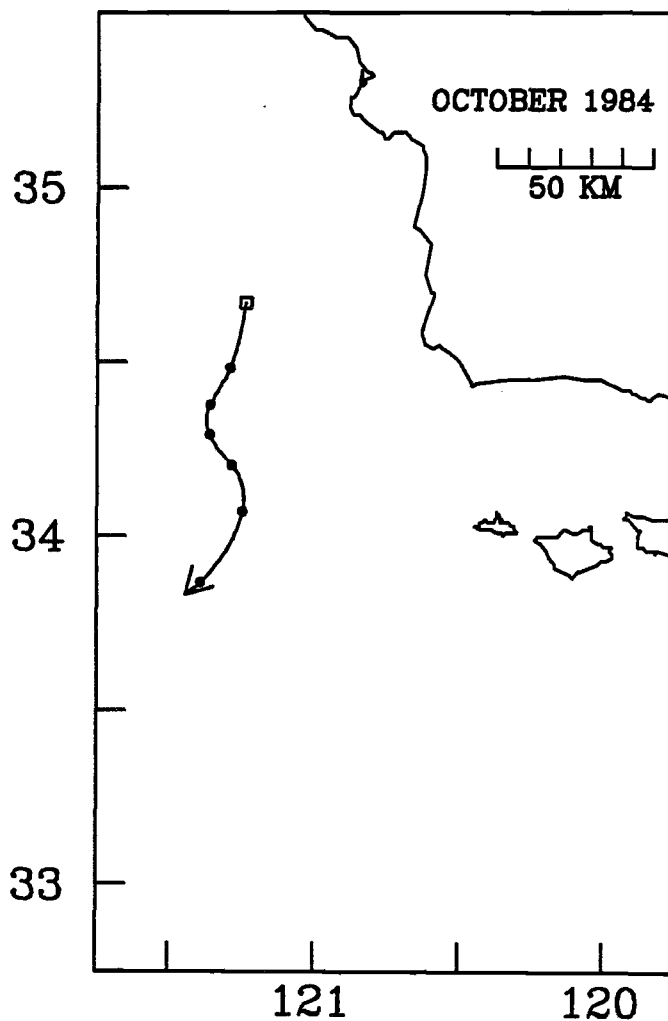
NDBC Buoy 46011



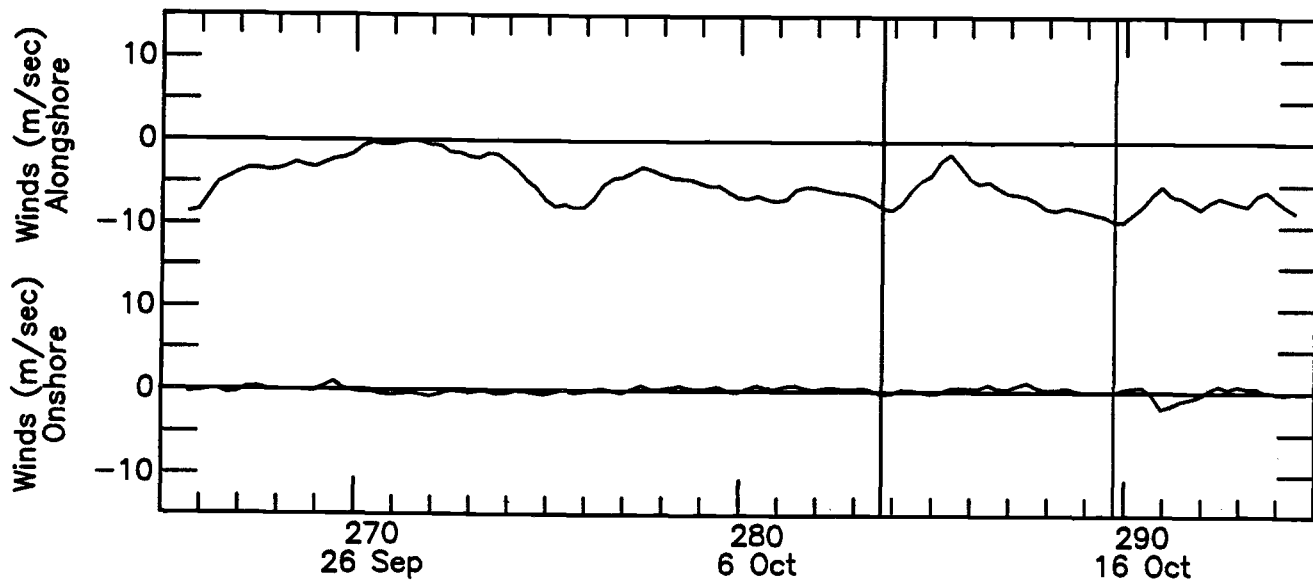
DRIFTER 10

TIME (days)	LAT (deg N)	LON (deg W)	SPEED (km/day)
283.71	34.69	121.24	
283.98	34.61	121.25	34.52
284.43	34.53	121.27	19.31
284.67	34.48	121.32	30.68
284.98	34.44	121.33	15.17
285.57	34.41	121.36	7.09
285.98	34.33	121.38	20.41
286.41	34.30	121.35	10.33
286.71	34.27	121.34	11.25
287.00	34.24	121.35	12.59
287.81	34.20	121.28	11.42
287.99	34.12	121.25	25.60
288.40	34.07	121.26	13.72
288.76	34.02	121.24	16.20
289.42	33.85	121.39	35.35
289.72	33.81	121.44	21.74

DRIFTER 10



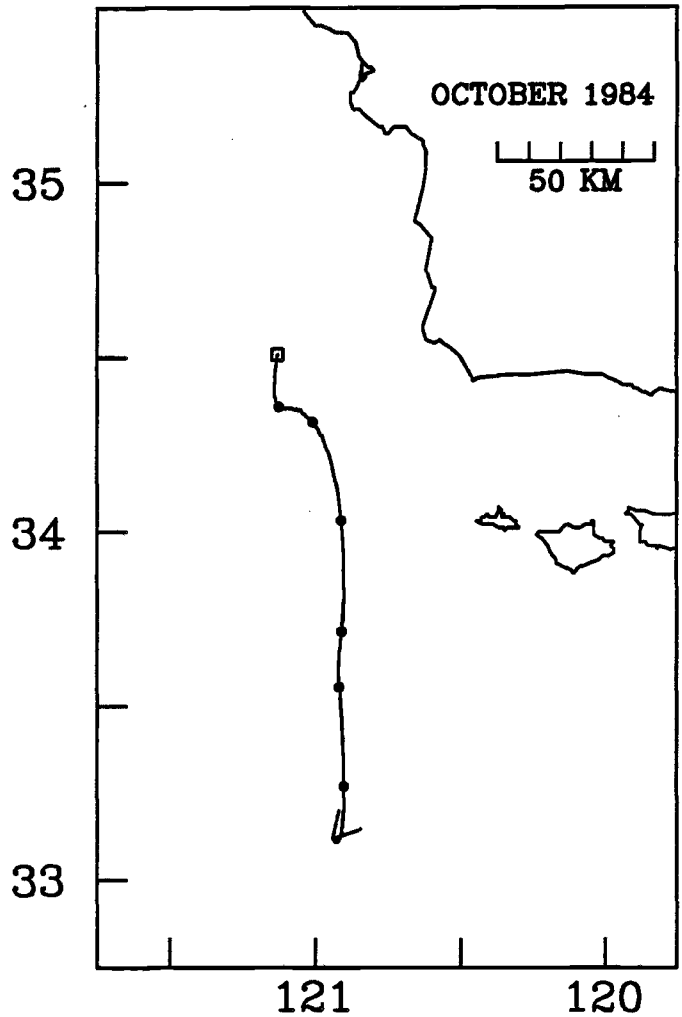
NDBC Buoy 46011



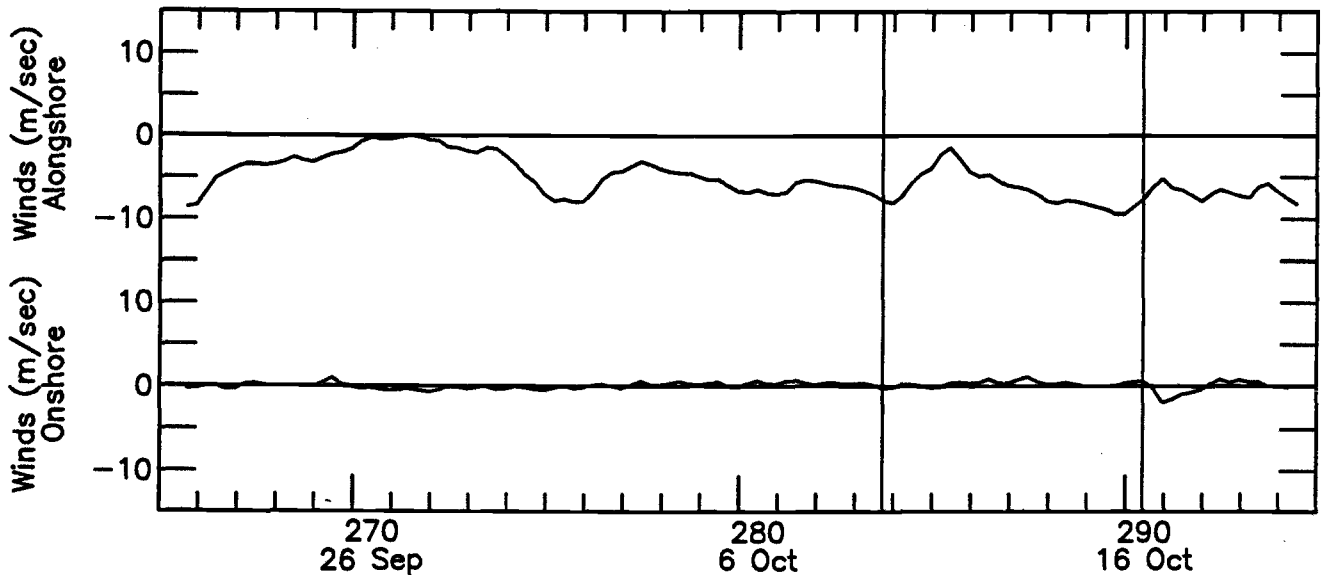
DRIFTER 11

DRIFTER 11

TIME (days)	LAT (deg N)	LON (deg W)	SPEED (km/day)
283.72	34.55	121.14	
283.98	34.47	121.14	32.88
284.44	34.44	121.12	10.05
284.68	34.42	121.10	12.80
284.99	34.38	121.10	11.53
285.58	34.35	121.03	12.50
285.98	34.27	120.94	30.50
286.43	34.10	120.89	41.85
286.73	33.97	120.88	48.98
287.01	33.84	120.91	52.88
287.63	33.72	120.96	23.23
288.01	33.62	120.93	28.48
288.42	33.57	120.88	18.79
289.44	33.28	120.91	31.45
290.44	33.12	120.94	18.35



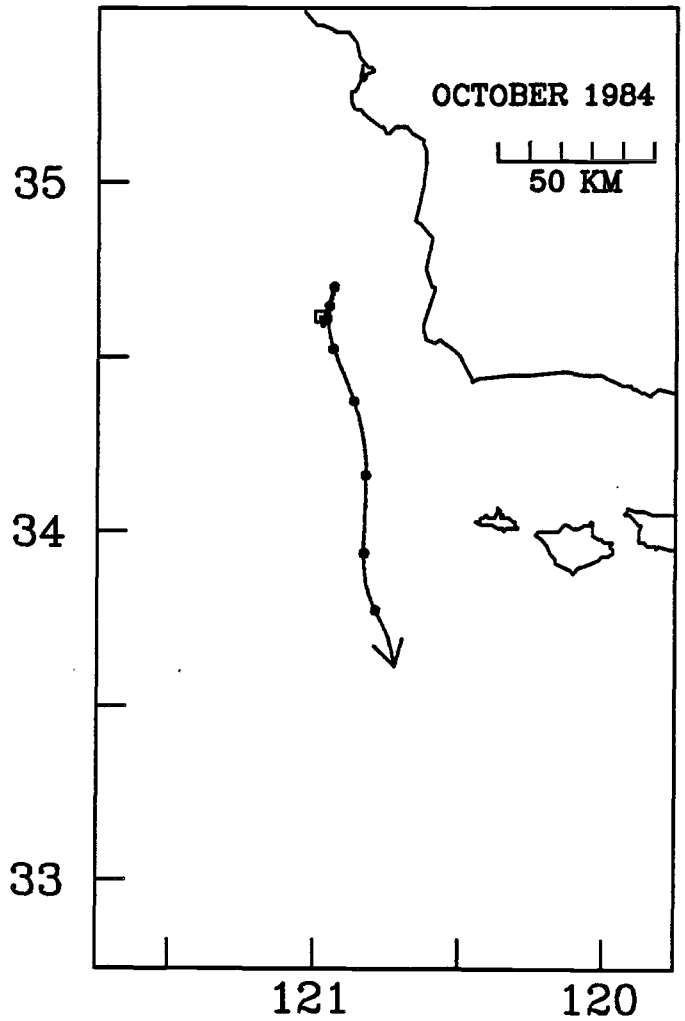
NDBC Buoy 46011



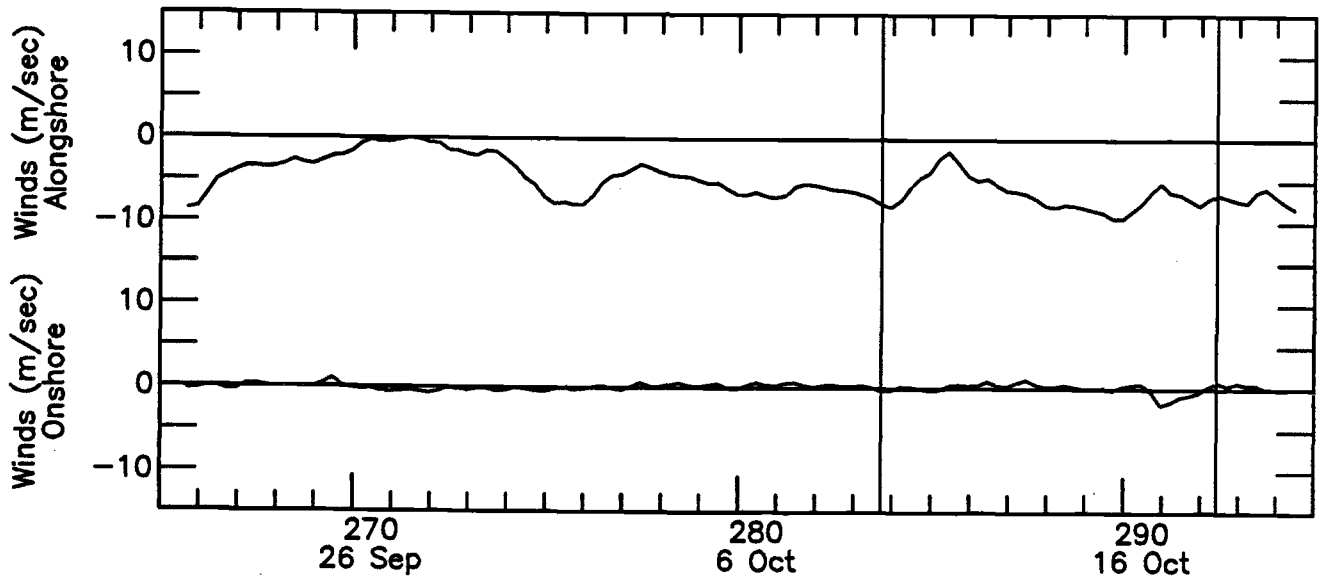
DRIFTER 12

TIME (days)	LAT (deg N)	LON (deg W)	SPEED (km/day)
283.72	34.67	120.98	
283.99	34.64	120.98	9.01
284.45	34.67	120.96	8.41
284.68	34.69	120.95	7.42
285.00	34.72	120.96	10.74
285.59	34.79	120.93	13.89
286.00	34.74	120.94	12.64
286.45	34.71	120.97	10.90
286.75	34.67	120.94	14.24
286.99	34.62	120.96	24.66
287.68	34.58	120.92	8.45
288.04	34.45	120.91	37.45
288.49	34.39	120.90	15.70
288.80	34.32	120.84	31.66
289.39	34.19	120.82	23.66
289.70	34.13	120.79	25.24
290.37	33.95	120.87	32.41
291.53	33.76	120.77	19.11
292.43	33.60	120.73	20.72

DRIFTER 12



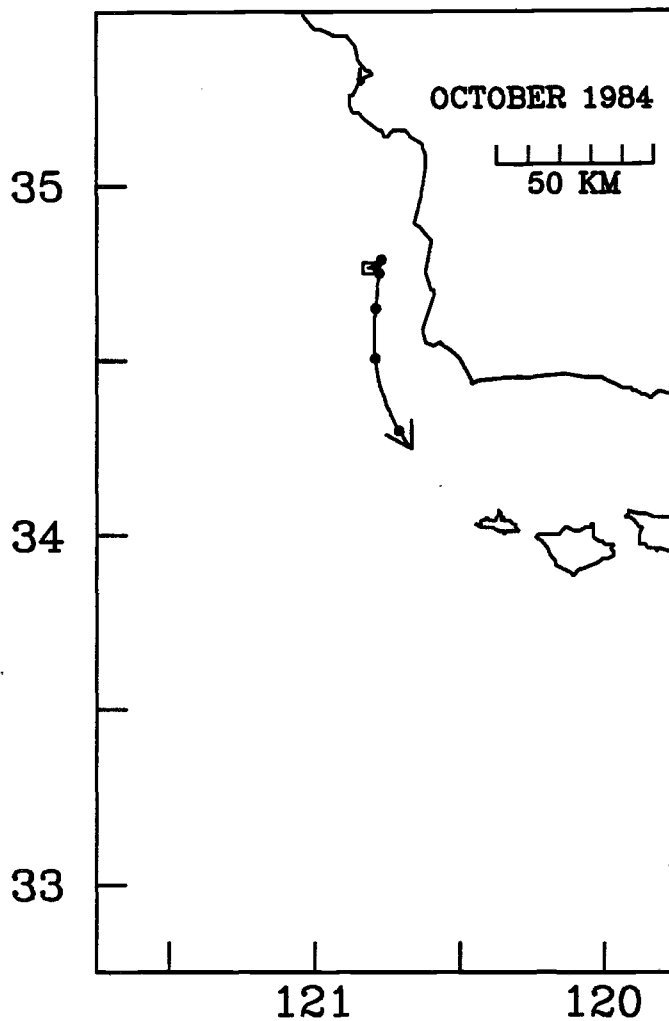
NDBC Buoy 46011



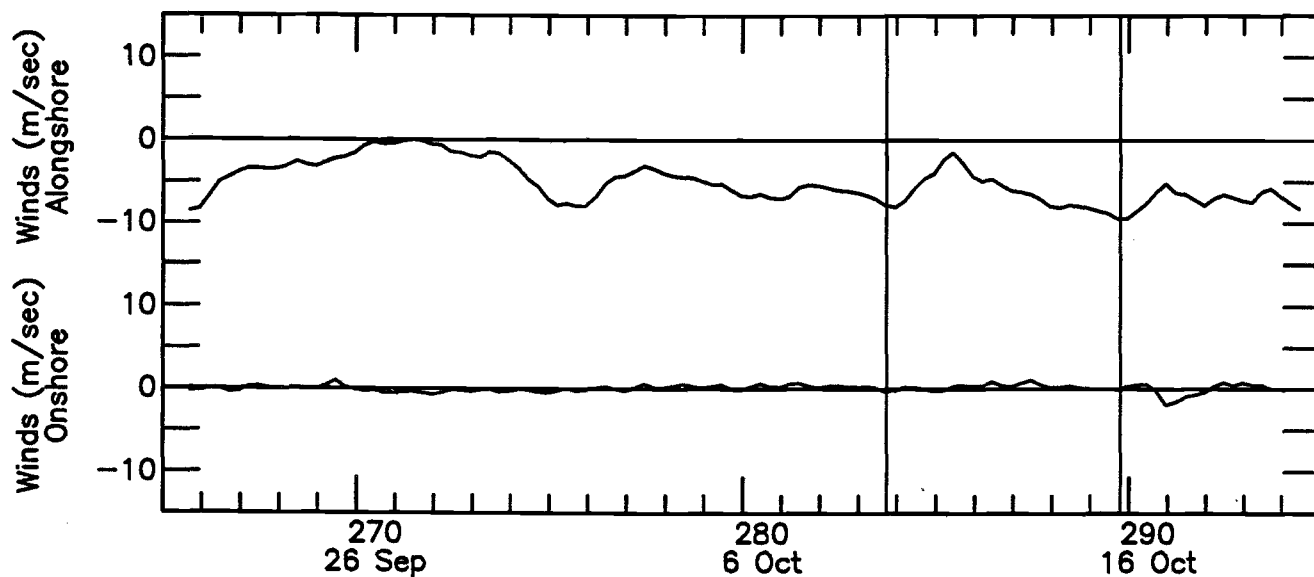
DRIFTER 13

DRIFTER 13

TIME (days)	LAT (deg N)	LON (deg W)	SPEED (km/day)
283.72	34.78	120.81	
284.00	34.77	120.82	7.69
284.46	34.82	120.79	13.51
284.69	34.78	120.77	18.10
285.01	34.78	120.79	7.05
285.60	34.82	120.75	9.79
286.45	34.77	120.80	8.04
286.77	34.72	120.78	18.39
287.69	34.64	120.79	9.20
288.05	34.57	120.79	21.67
288.50	34.50	120.80	17.30
289.52	34.29	120.71	23.92
289.77	34.24	120.66	31.98



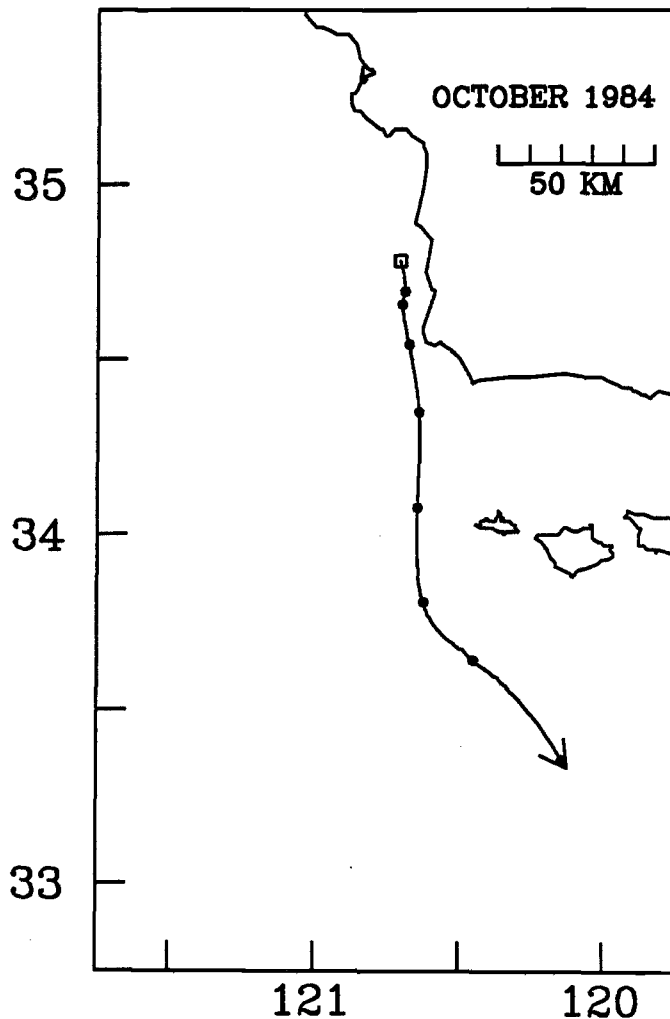
NDBC Buoy 46011



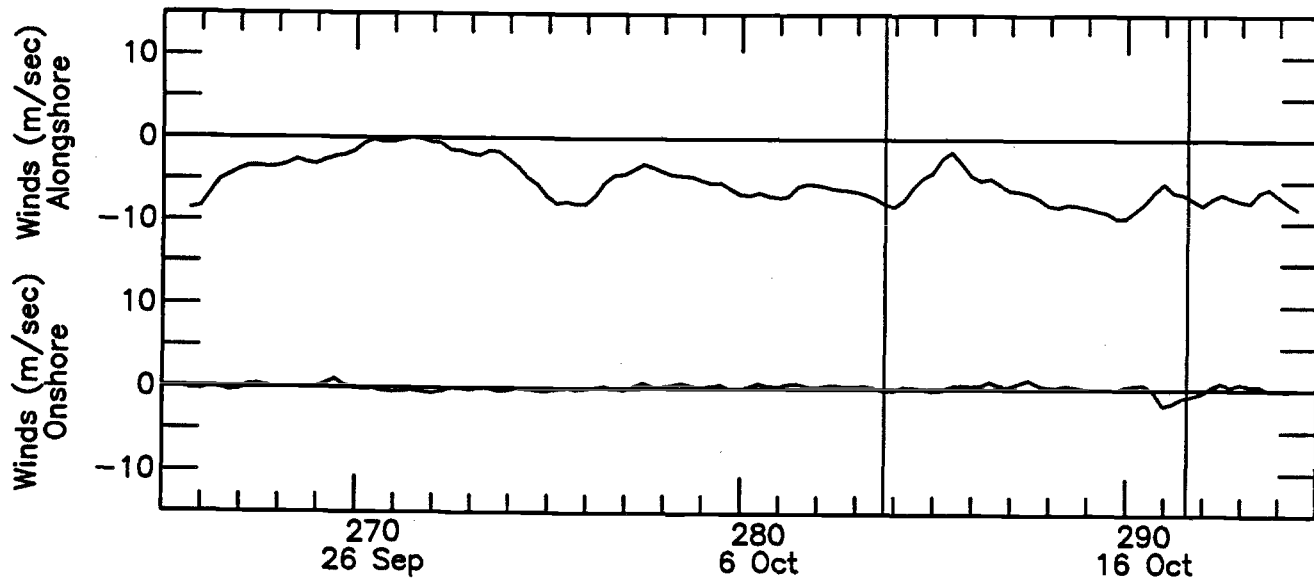
DRIFTER 14

TIME (days)	LAT (deg N)	LON (deg W)	SPEED (km/day)
283.74	34.84	120.70	
284.00	34.79	120.70	23.03
284.47	34.79	120.72	3.77
284.70	34.76	120.67	25.23
285.01	34.71	120.68	18.30
285.61	34.74	120.69	5.41
286.01	34.67	120.72	18.41
286.46	34.59	120.69	21.09
286.77	34.52	120.67	25.62
287.09	34.46	120.63	25.03
287.67	34.35	120.62	21.58
288.03	34.21	120.66	43.95
288.46	34.08	120.66	31.10
288.78	33.97	120.65	40.13
289.47	33.79	120.62	28.49
289.74	33.74	120.59	25.50
290.38	33.64	120.49	22.20
291.58	33.30	120.12	42.59

DRIFTER 14



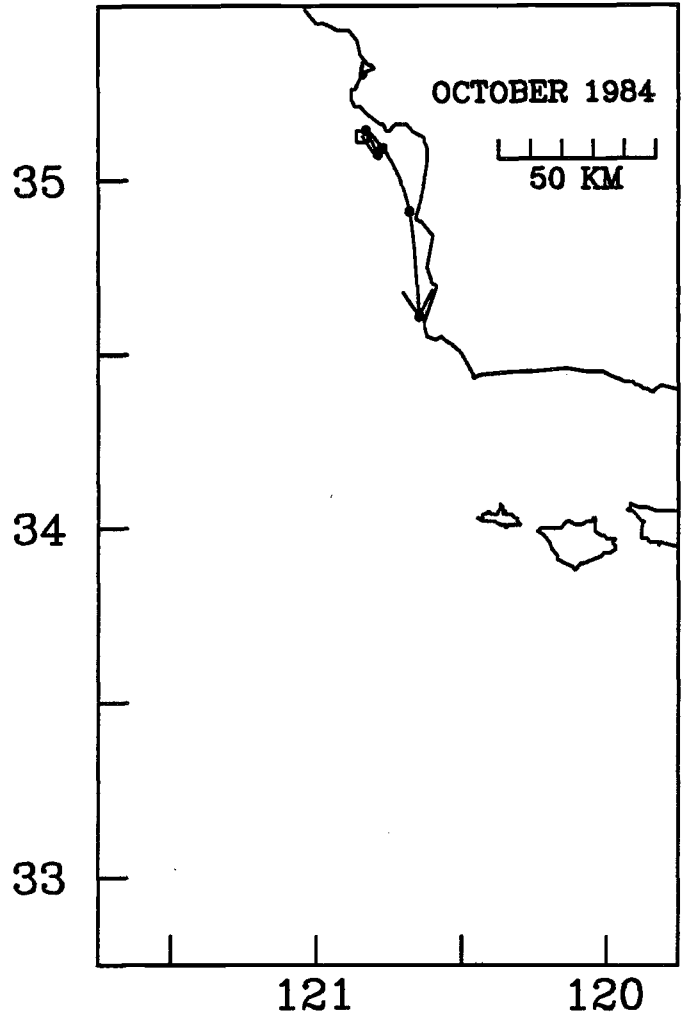
NDBC Buoy 46011



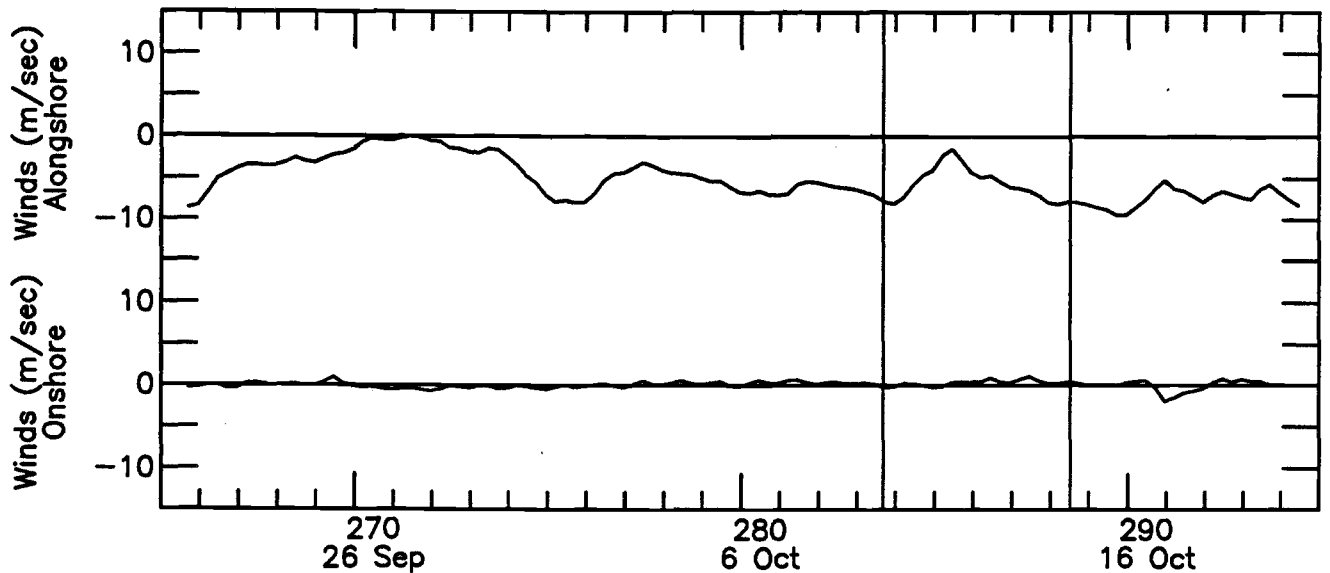
DRIFTER 15

TIME (days)	LAT (deg N)	LON (deg W)	SPEED (km/day)
283.89	35.14	120.84	
283.96	35.07	120.80	31.15
284.40	35.09	120.81	7.16
284.65	35.10	120.78	10.55
284.96	35.12	120.78	3.80
285.55	35.17	120.86	14.80
285.95	35.14	120.85	7.31
286.38	35.13	120.78	15.05
286.68	35.08	120.73	21.45
286.97	35.01	120.70	30.83
287.55	34.92	120.71	16.67
288.06	34.74	120.66	41.43
288.52	34.81	120.64	32.23

DRIFTER 15

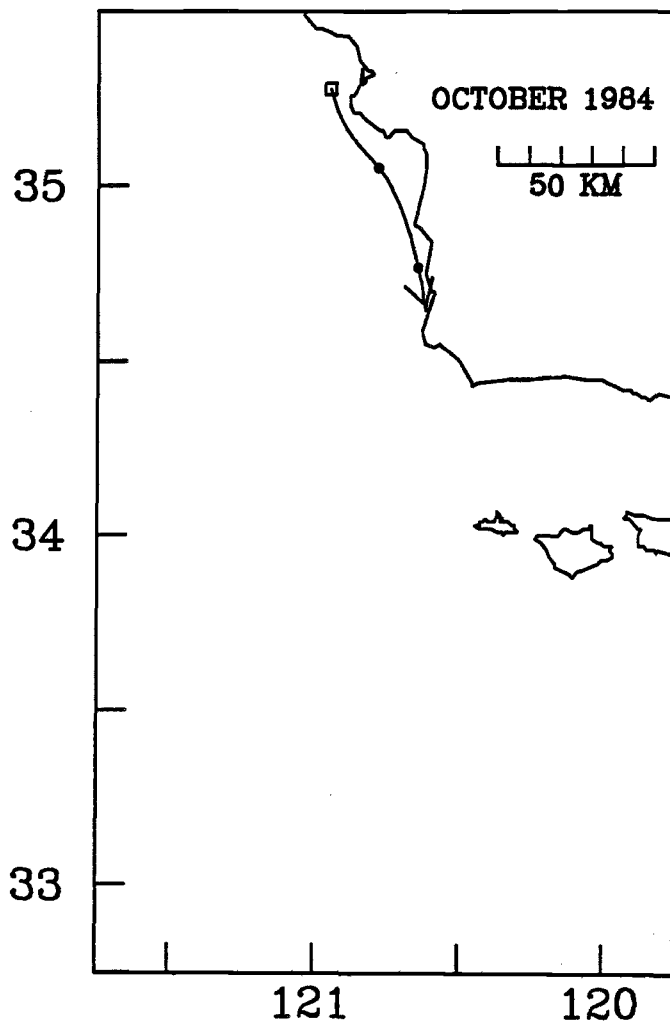


NDBC Buoy 46011

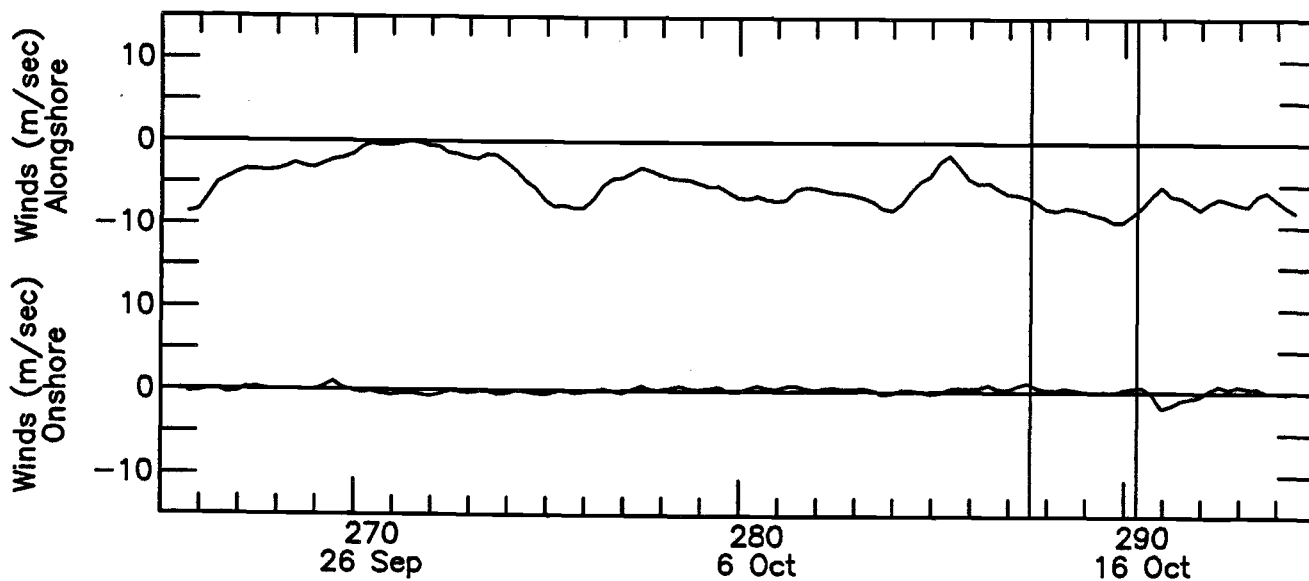


DRIFTER 16

TIME (days)	LAT (deg N)	LON (deg W)	SPEED (km/day)
287.57	35.28	120.94	
287.96	35.14	120.87	41.86
288.36	35.08	120.84	19.43
288.73	35.02	120.72	34.89
289.36	34.81	120.67	37.92
289.67	34.72	120.64	33.35
290.33	34.67	120.62	9.42



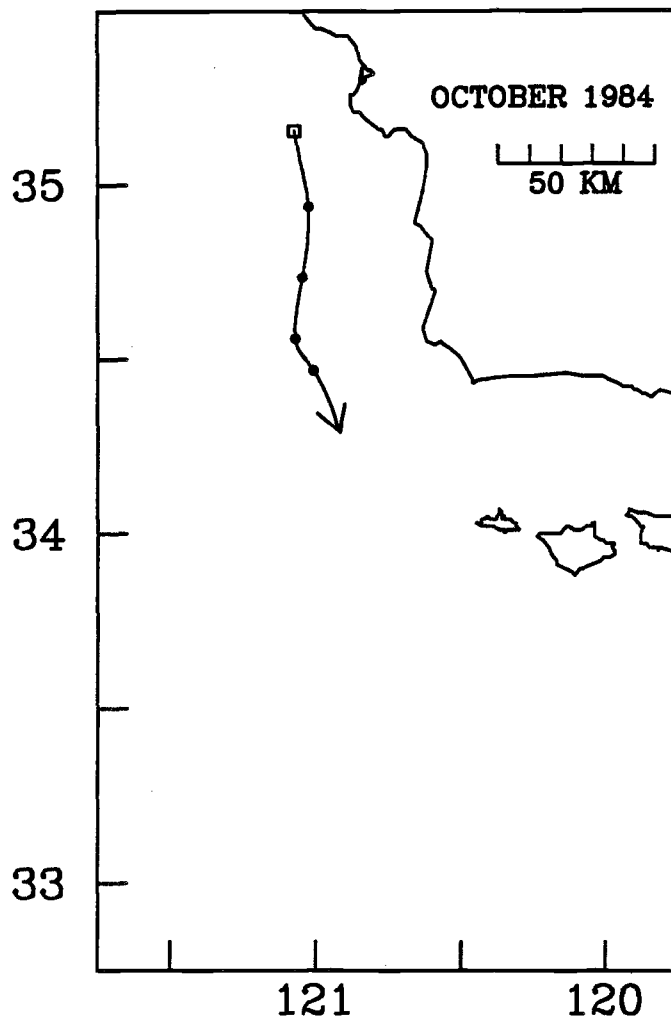
NDBC Buoy 46011



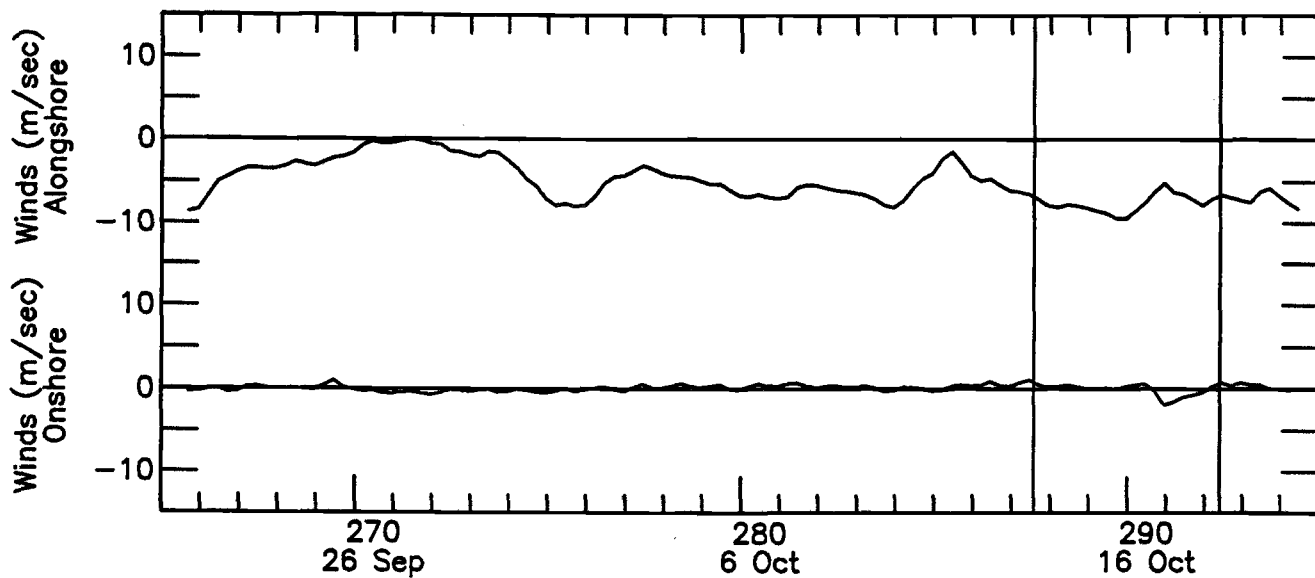
DRIFTER 17

TIME (days)	LAT (deg N)	LON (deg W)	SPEED (km/day)
287.57	35.16	121.07	
287.96	35.03	121.03	40.18
288.37	34.97	121.04	15.12
288.73	34.92	121.02	18.34
289.36	34.77	121.05	26.15
289.68	34.69	121.03	28.60
290.34	34.59	121.09	18.31
291.46	34.47	121.00	13.74
292.40	34.29	120.92	22.91

DRIFTER 17



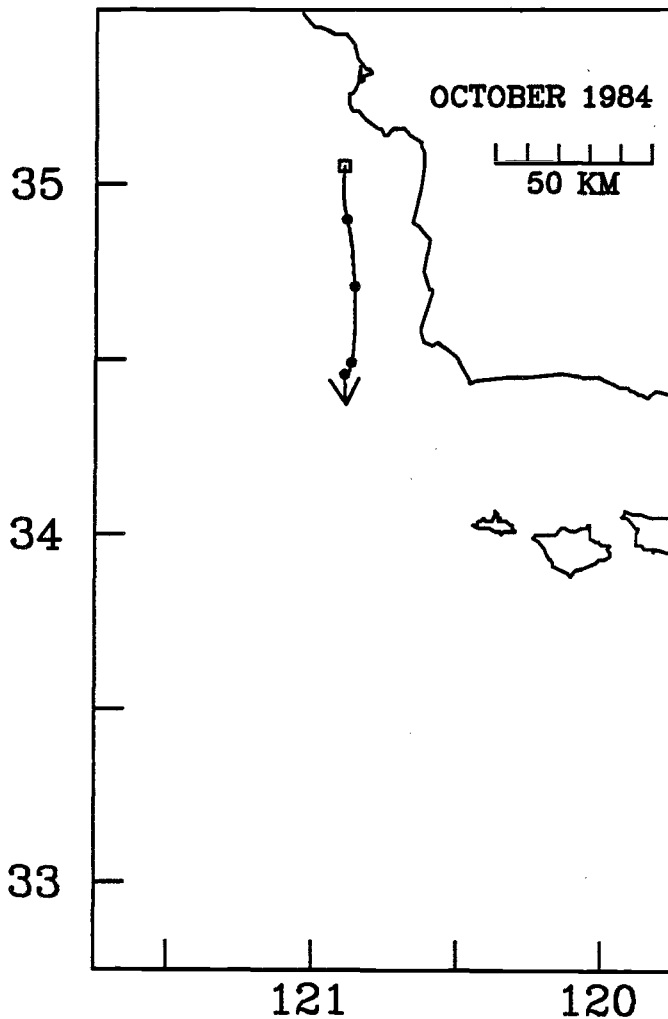
NDBC Buoy 46011



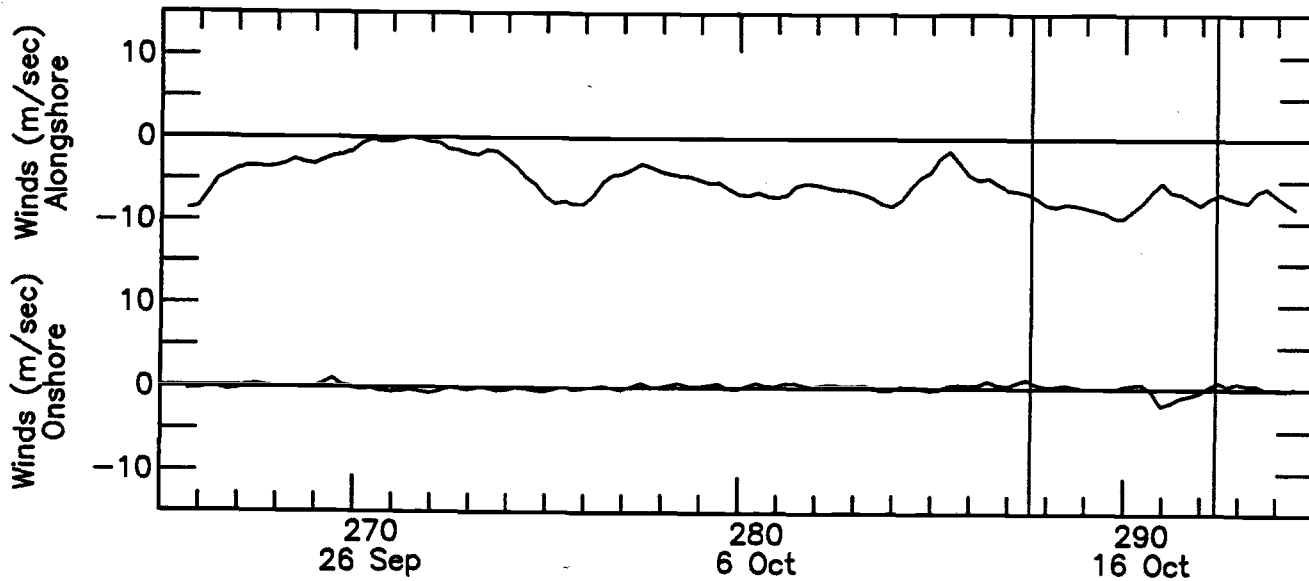
DRIFTER 18

TIME (days)	LAT (deg N)	LON (deg W)	SPEED (km/day)
287.58	35.08	120.90	
287.97	34.96	120.87	28.72
288.37	34.93	120.92	13.60
288.74	34.89	120.87	16.93
289.37	34.73	120.88	27.71
289.68	34.68	120.82	25.53
290.34	34.51	120.87	28.86
290.71	34.47	120.89	12.47
291.45	34.48	120.88	2.75
292.39	34.38	120.89	11.34

DRIFTER 18



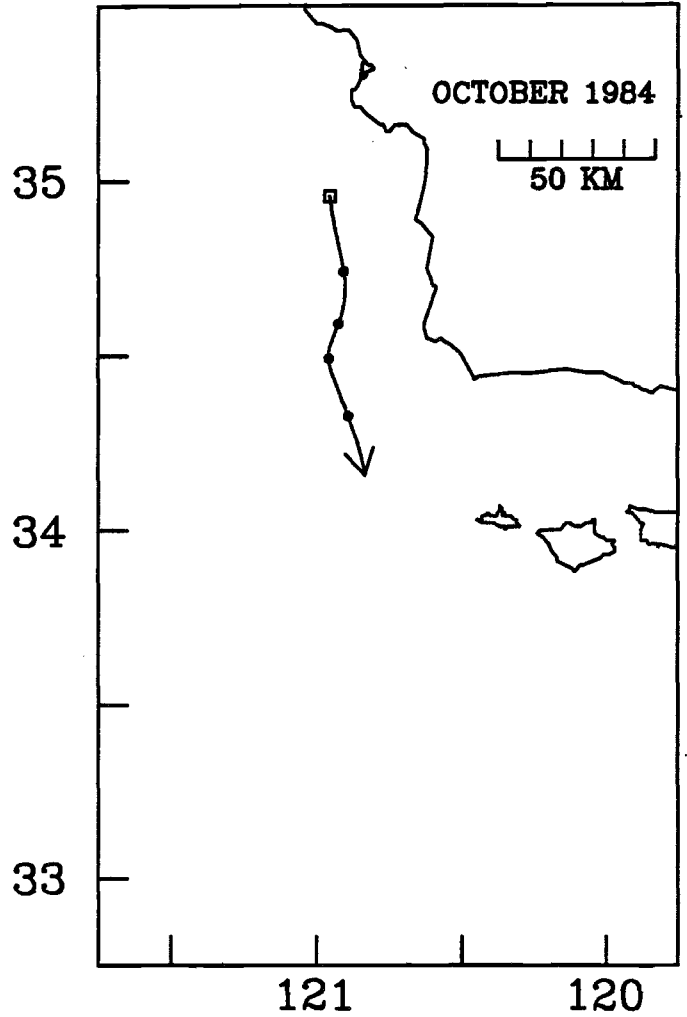
NDBC Buoy 46011



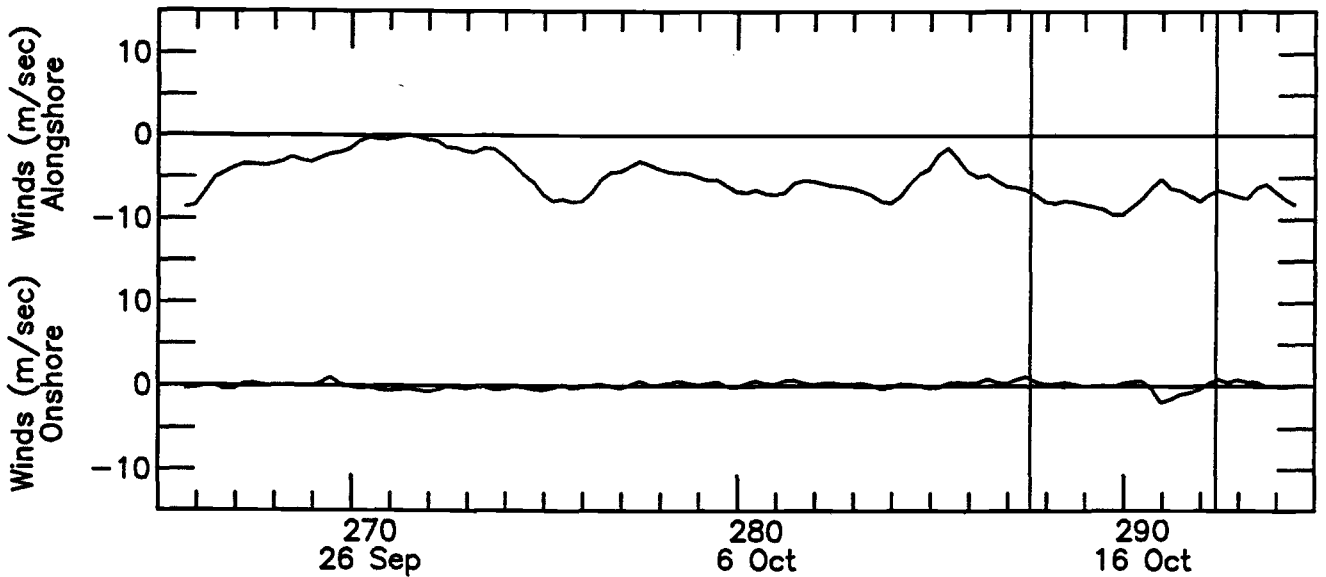
DRIFTER 19

DRIFTER 19

TIME (days)	LAT (deg N)	Lon (deg W)	SPEED (km/day)
287.58	34.97	120.95	
287.97	34.83	120.93	40.68
288.38	34.80	120.92	8.28
288.74	34.72	120.90	25.34
289.38	34.60	120.92	20.22
289.69	34.58	120.91	7.26
290.35	34.51	120.96	13.36
290.71	34.48	120.98	11.30
291.45	34.34	120.88	24.98
292.40	34.15	120.84	21.73



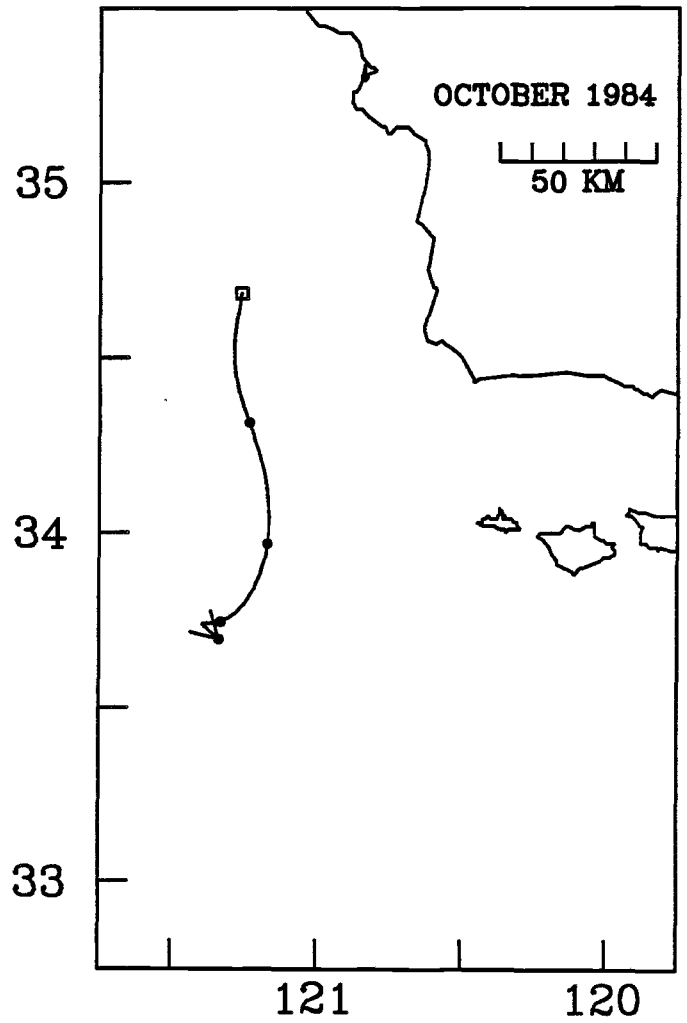
NDBC Buoy 46011



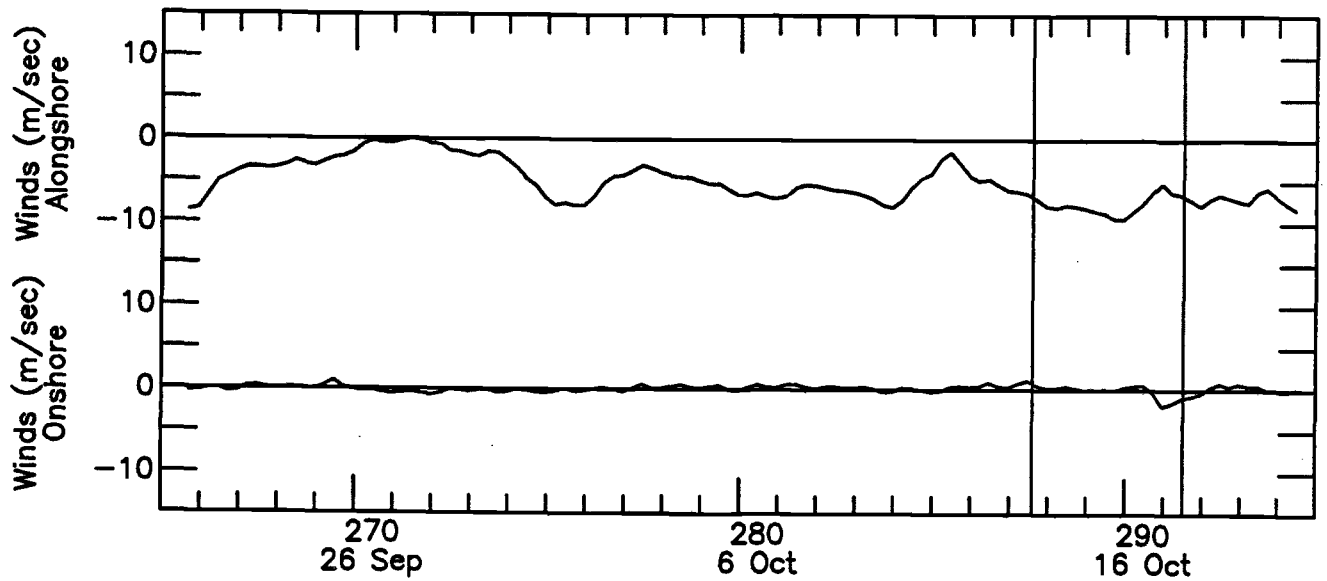
DRIFTER 20

TIME (days)	LAT (deg N)	LON (deg W)	SPEED (km/day)
287.59	34.87	121.26	
287.98	34.47	121.29	57.87
288.39	34.36	121.24	32.47
288.76	34.25	121.22	31.68
289.40	34.01	121.17	42.61
289.71	33.89	121.15	44.18
290.46	33.76	121.35	31.37
291.52	33.69	121.33	6.98

DRIFTER 20



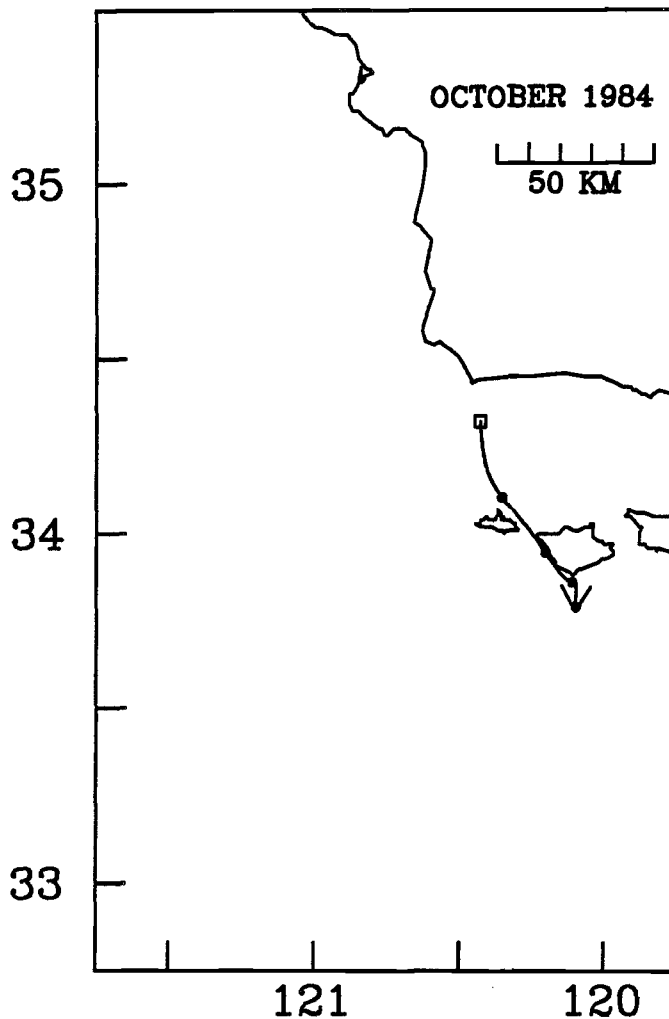
NDBC Buoy 46011



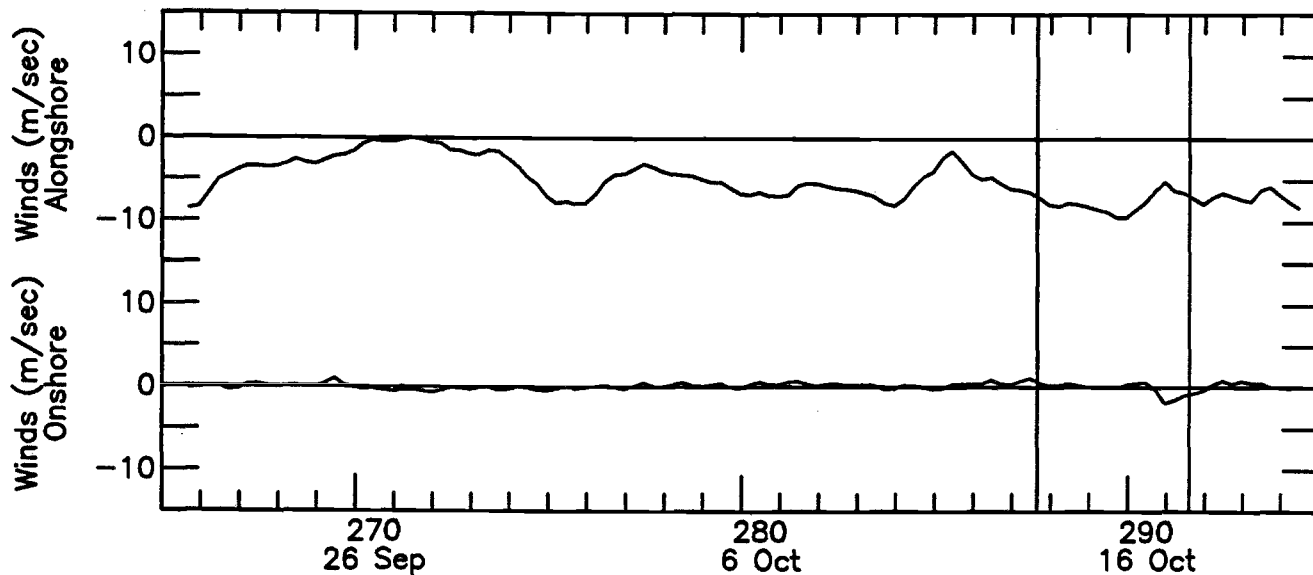
DRIFTER 21

DRIFTER 21

TIME (days)	LAT (deg N)	LON (deg W)	SPEED (km/day)
287.66	34.33	120.42	
288.03	34.18	120.43	44.68
288.47	34.12	120.35	23.32
288.79	34.08	120.30	19.71
289.55	33.94	120.20	23.48
289.76	33.91	120.18	19.92
290.40	33.87	120.11	11.29
291.59	33.76	120.10	9.83

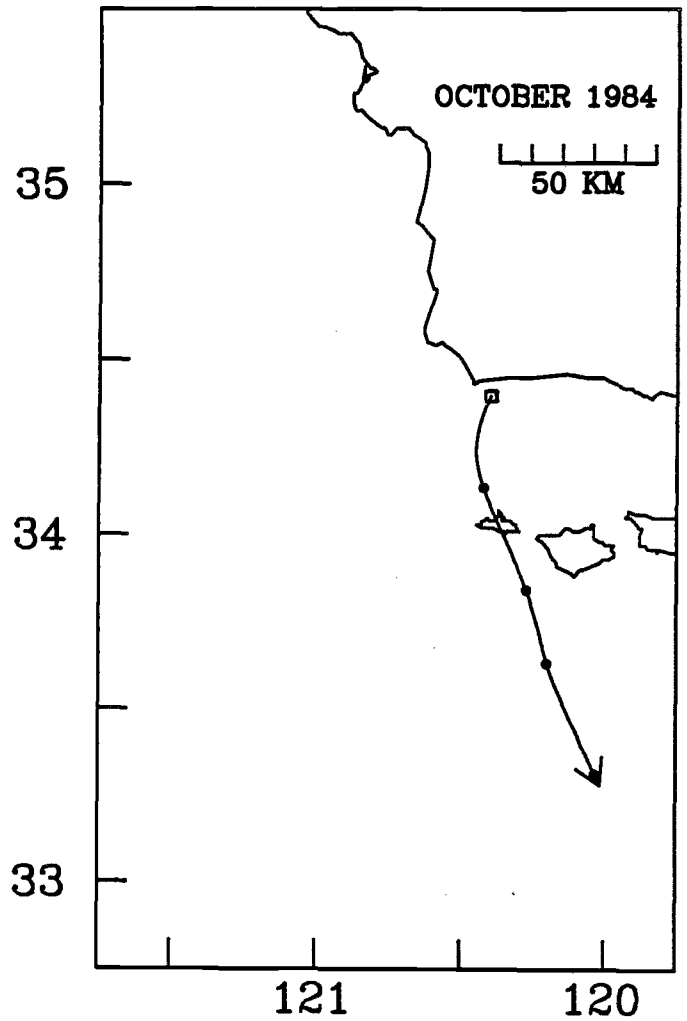


NDBC Buoy 46011

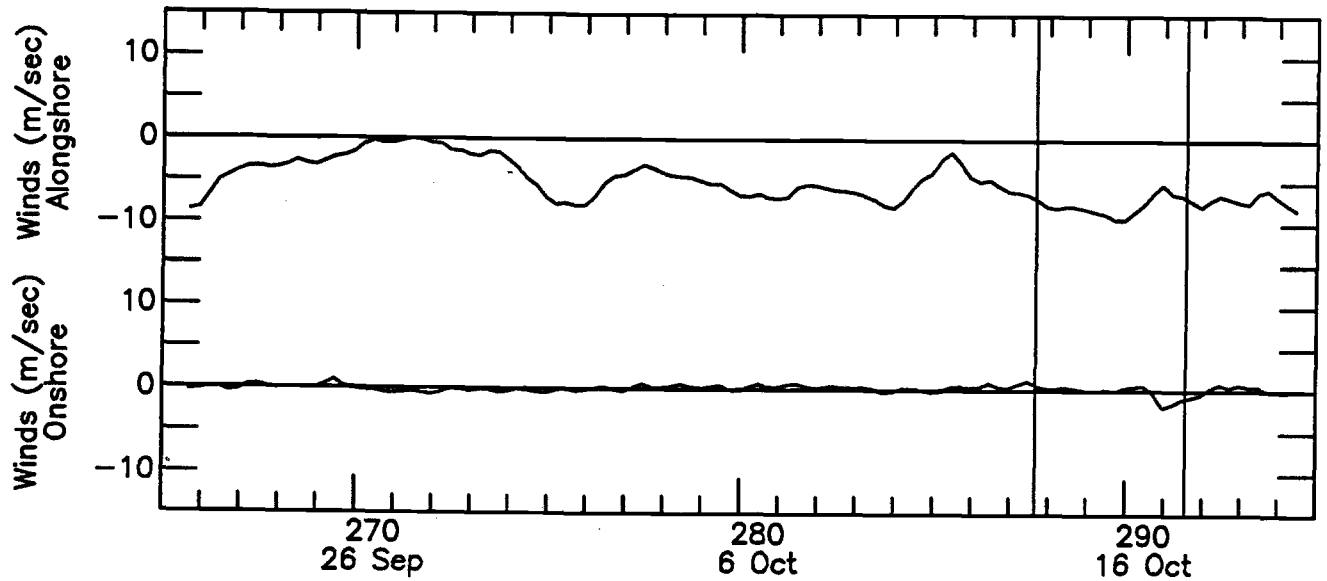


DRIFTER 22

DRIFTER	22		
TIME (days)	LAT (deg N)	LON (deg W)	SPEED (km/day)
287.86	34.41	120.40	
288.03	34.27	120.44	42.20
288.48	34.14	120.45	33.99
288.79	34.09	120.38	27.79
289.54	33.83	120.25	40.88
289.75	33.78	120.25	28.99
290.41	33.66	120.23	20.36
291.57	33.27	120.01	41.23



NDBC Buoy 46011

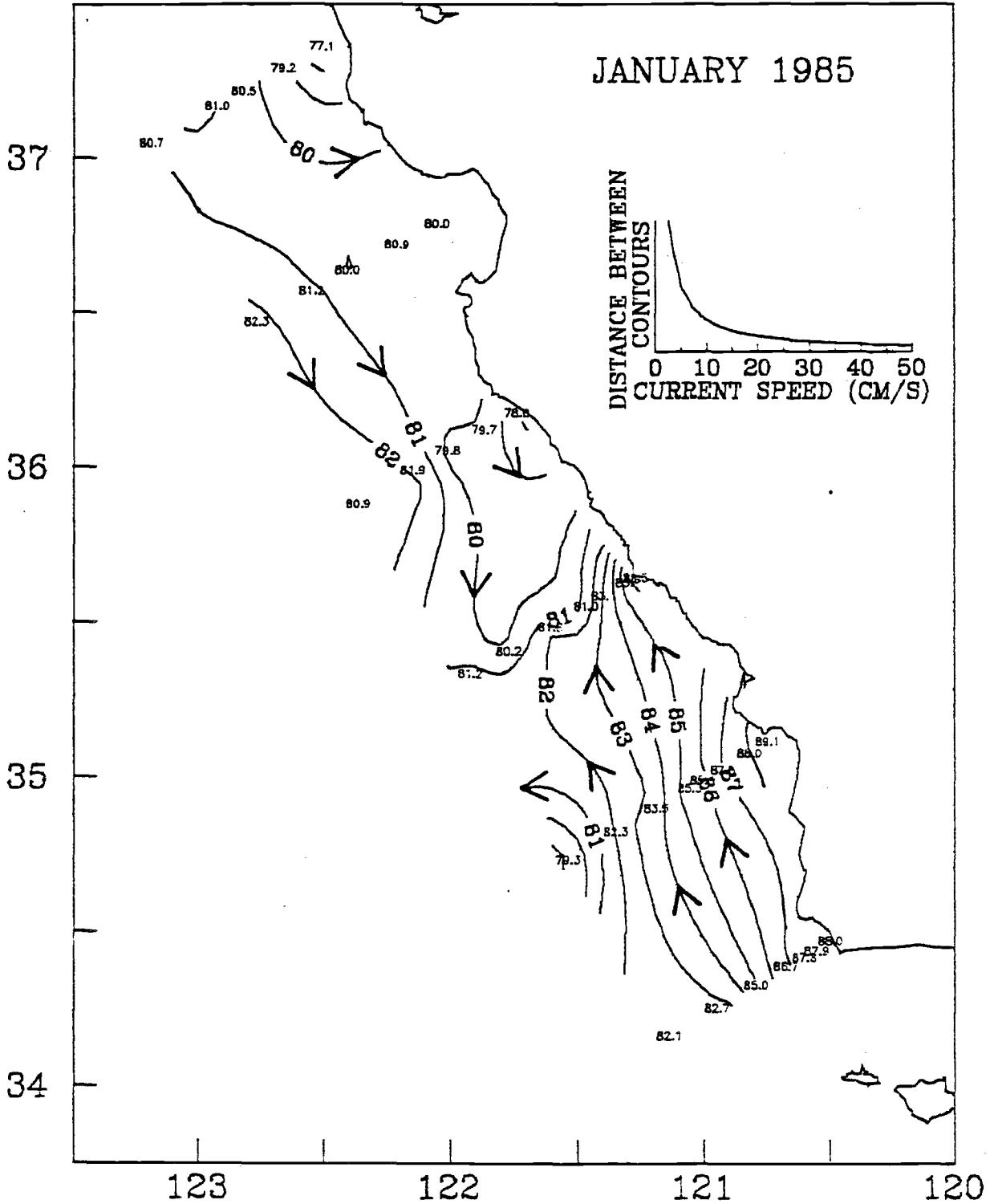


CRUISE 8501, JANUARY 1985

DYNAMIC HEIGHT (DYN CM)

0/500 M

JANUARY 1985



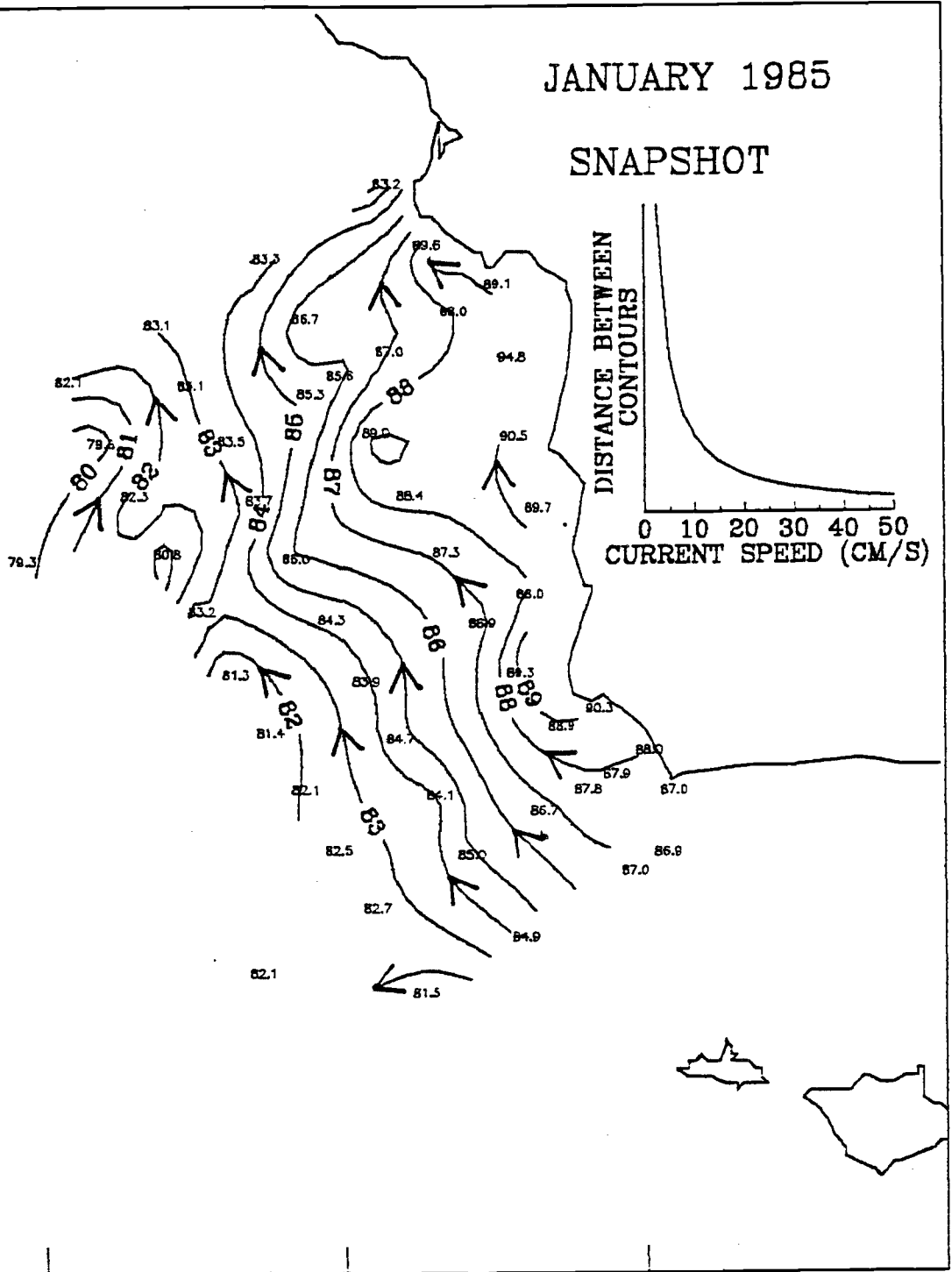
DYNAMIC HEIGHT (DYN CM)

0/500 M

JANUARY 1985

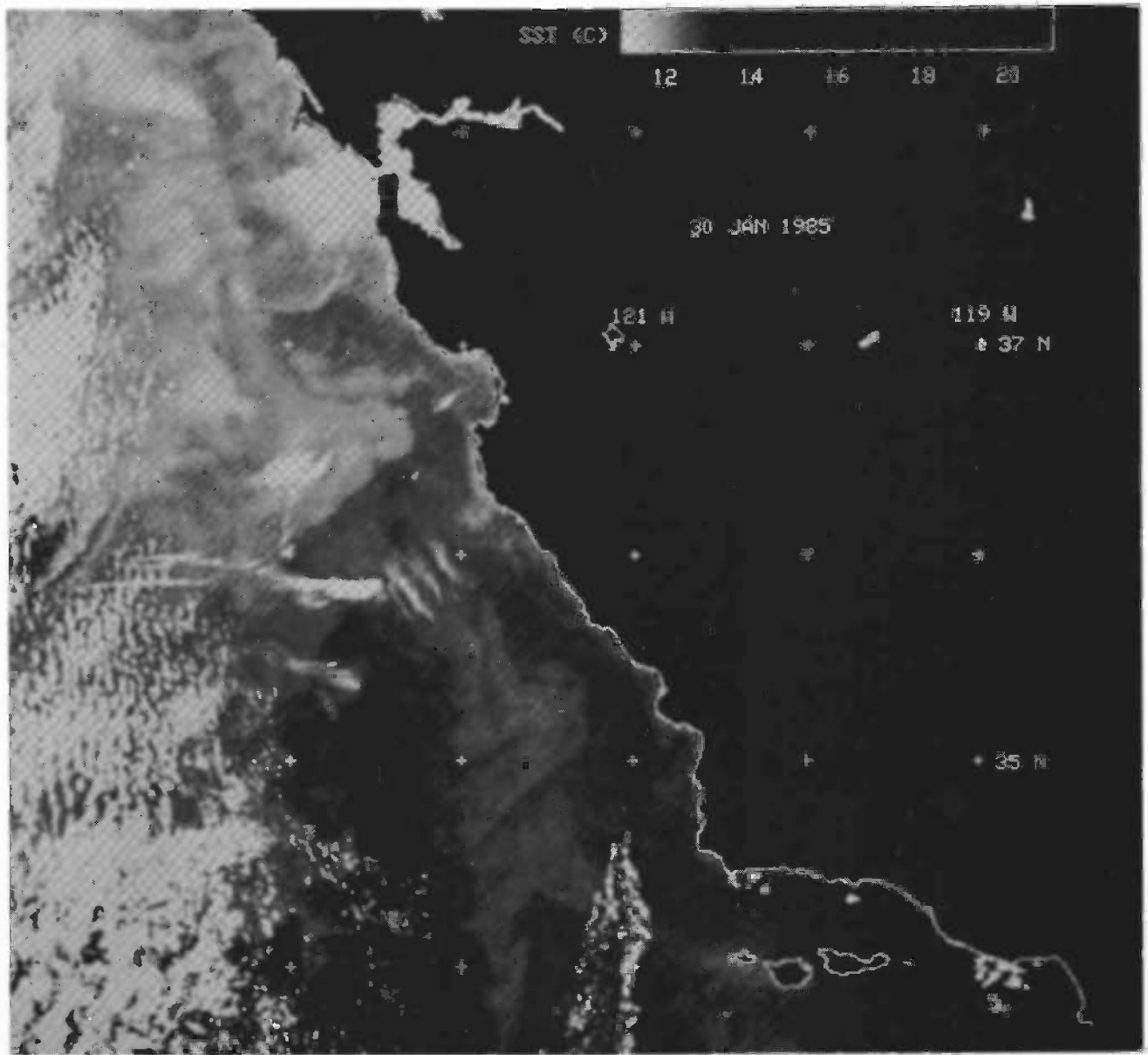
SNAPSHOT

35



121

120



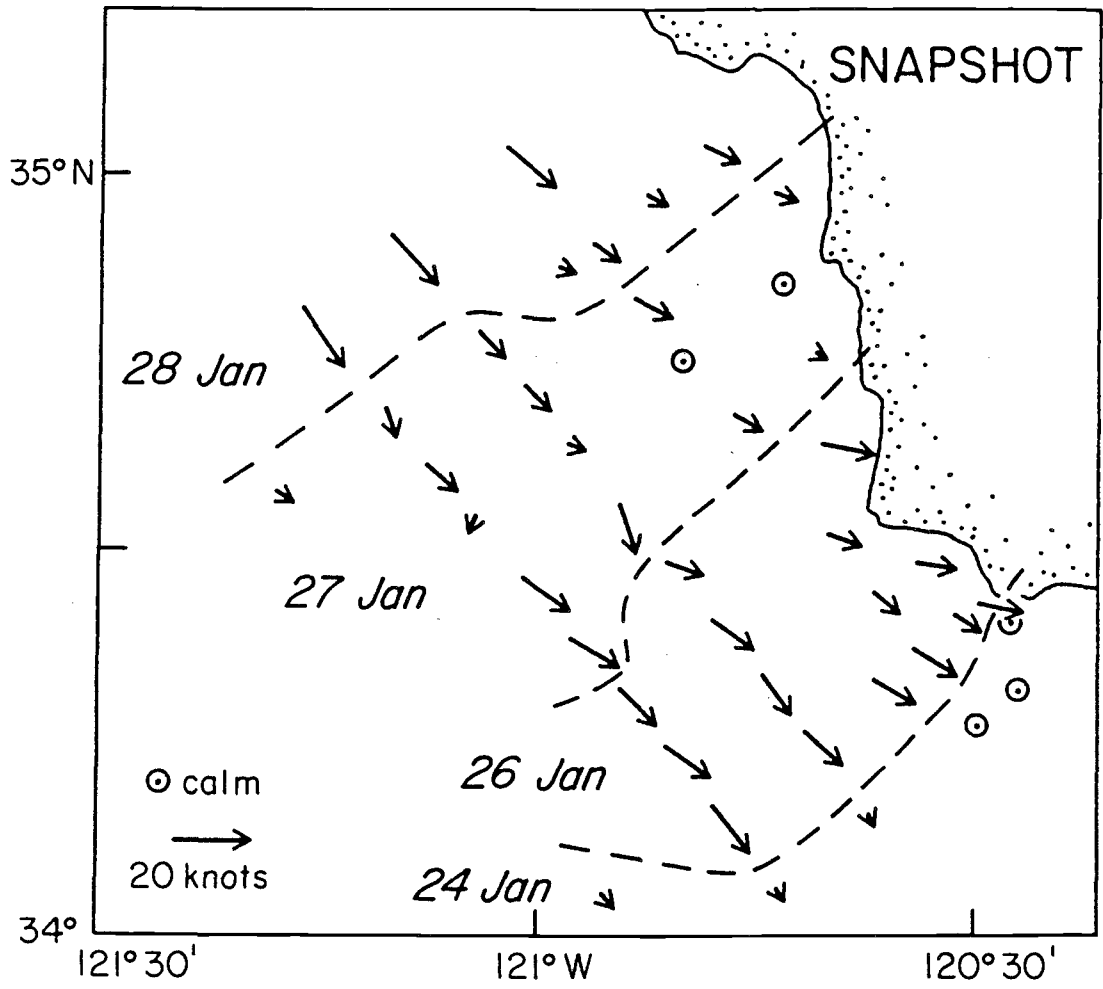


Table 4

CRUISE 8501 - JANUARY 1985

DRIFTER NUMBER	NUMBER OBS	RELEASE LAT	RELEASE LON	RELEASE TIME	LAST OBS TIME
	1	35.13	120.89	19.70 (19 Jan.)	19.70 (19 Jan.)
1	31	35.04	121.04	19.71 (19 Jan.)	31.03 (31 Jan.)
2	22	34.94	121.17	19.71 (19 Jan.)	30.07 (30 Jan.)
3	24	34.82	121.31	19.71 (19 Jan.)	27.43 (27 Jan.)
4	40	34.57	121.13	19.72 (19 Jan.)	30.60 (30 Jan.)
5	23	34.68	121.00	19.73 (19 Jan.)	29.03 (29 Jan.)
6	33	34.77	120.87	19.73 (19 Jan.)	30.39 (30 Jan.)
7	26	34.87	120.72	19.73 (19 Jan.)	28.67 (28 Jan.)
8	18	34.94	121.23	24.01 (24 Jan.)	31.05 (31 Jan.)
	2	34.98	121.24	24.39 (24 Jan.)	24.69 (24 Jan.)
9	22	34.60	121.20	24.00 (24 Jan.)	31.39 (31 Jan.)
	2	34.64	121.28	24.38 (24 Jan.)	24.68 (24 Jan.)
10	27	34.68	121.07	24.00 (24 Jan.)	33.50 (2 Feb.)
11	27	34.74	120.89	23.99 (23 Jan.)	33.49 (2 Feb.)
12	18	34.41	120.39	23.98 (23 Jan.)	30.00 (30 Jan.)
13	25	34.30	120.35	23.98 (23 Jan.)	33.45 (2 Feb.)
	3	34.27	120.41	29.98 (29 Jan.)	30.99 (30 Jan.)
	3	34.36	120.40	29.99 (29 Jan.)	31.00 (31 Jan.)
14	10	34.72	120.69	29.65 (29 Jan.)	33.46 (2 Feb.)
15	10	34.65	120.79	29.65 (29 Jan.)	33.47 (2 Feb.)
16	27	34.86	120.92	29.64 (29 Jan.)	33.44 (2 Feb.)
17	27	34.88	120.89	29.64 (29 Jan.)	33.43 (2 Feb.)
18	27	34.90	120.85	29.64 (29 Jan.)	33.43 (2 Feb.)
19	28	34.92	120.81	29.64 (29 Jan.)	33.42 (2 Feb.)

CRUISE 8501 DRIFTERS 1 - 7

36

19 JANUARY 1985

50 KM

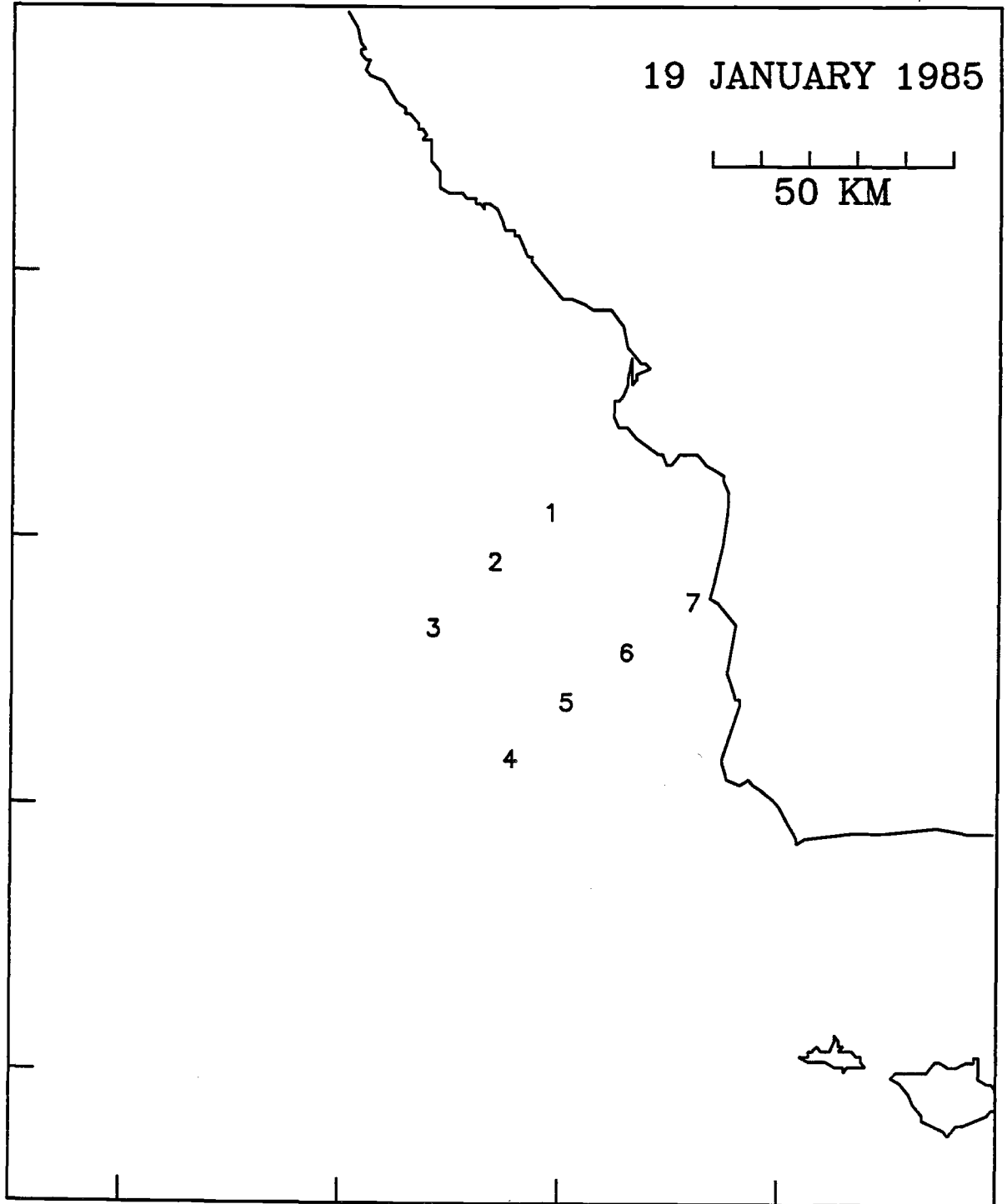
35

34

122

121

120



CRUISE 8501 DRIFTERS 8 - 13

36

24 JANUARY 1985

50 KM

35

8

11

10

9

12

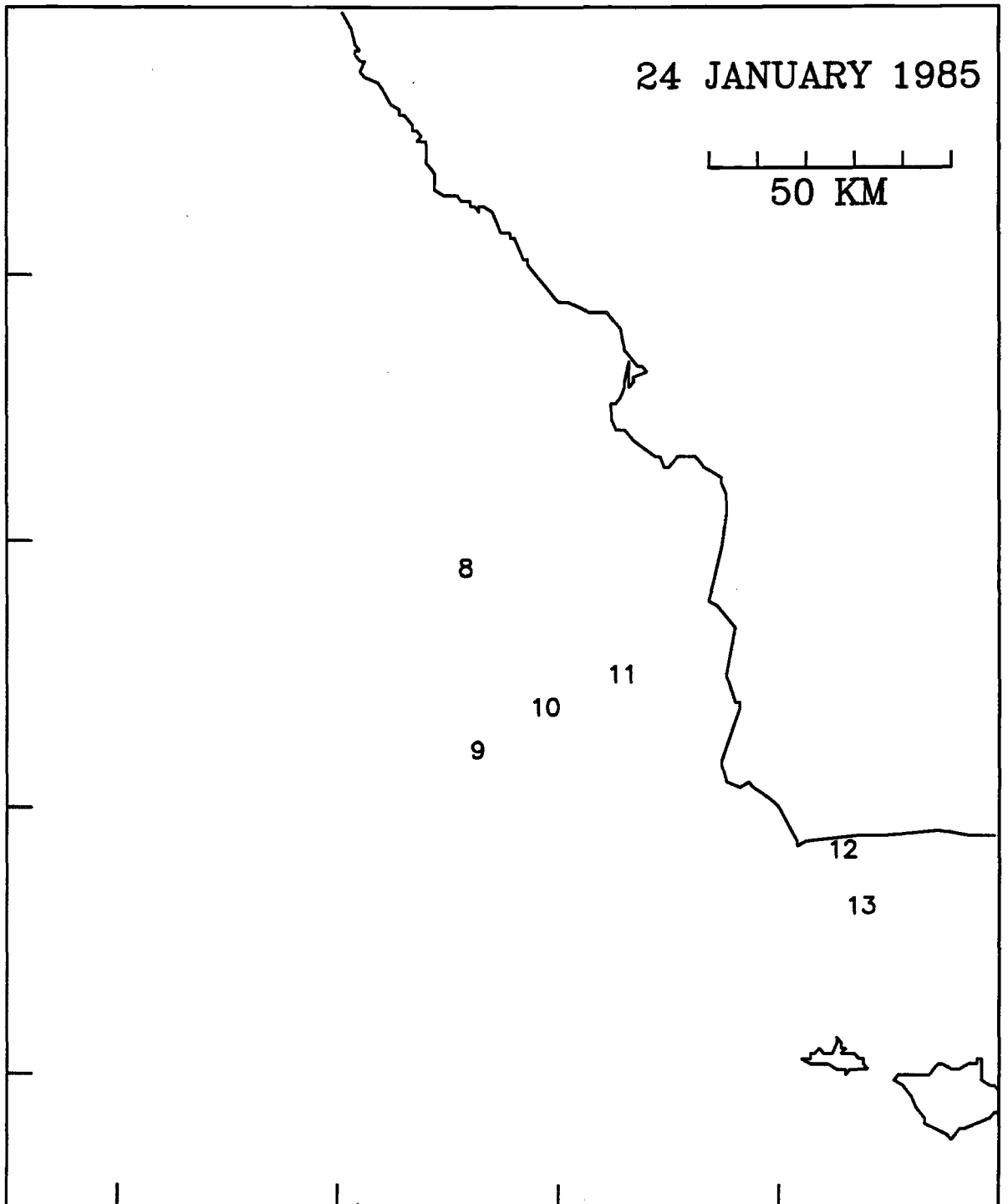
13

34

122

121

120



CRUISE 8501 DRIFTERS 14 - 19

36

29 JANUARY 1985

50 KM

35

16 18 19

14

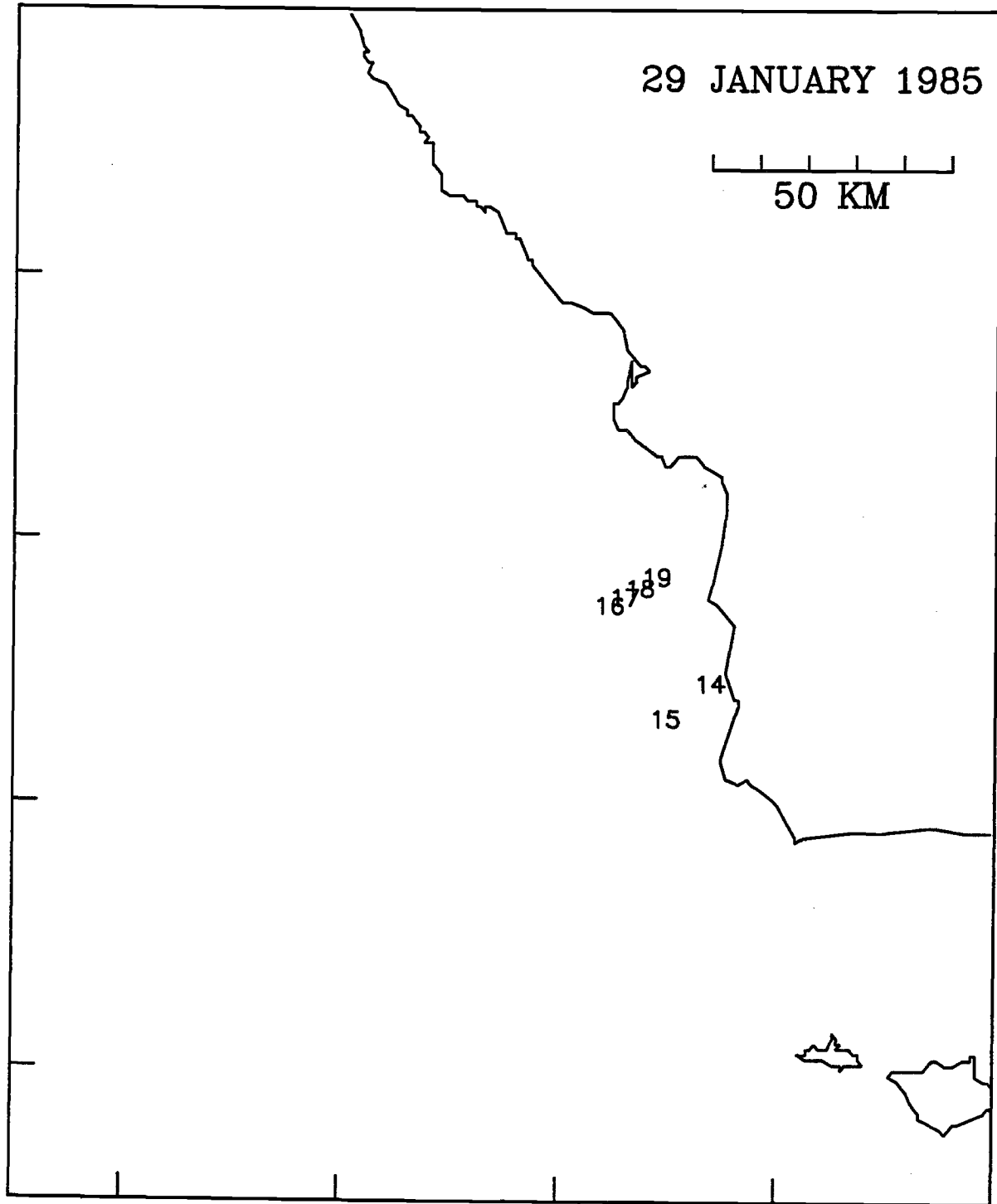
15

34

122

121

120



CRUISE 8501 DRIFTERS 1 - 19

36

JANUARY 1985

50 KM

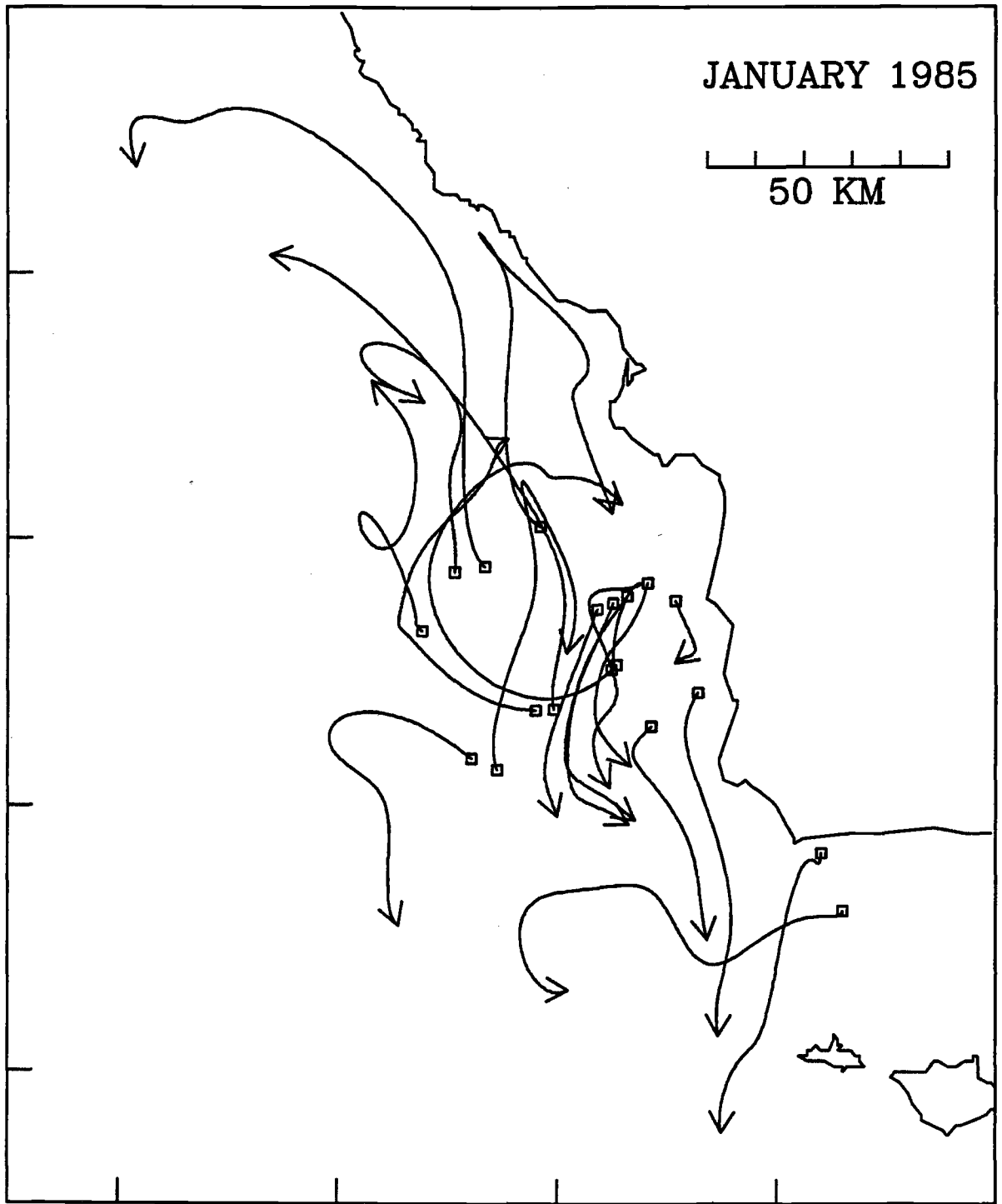
35

34

122

121

120



CRUISE 8501 DRIFTERS 1 - 7

36

19 JANUARY 1985

50 KM

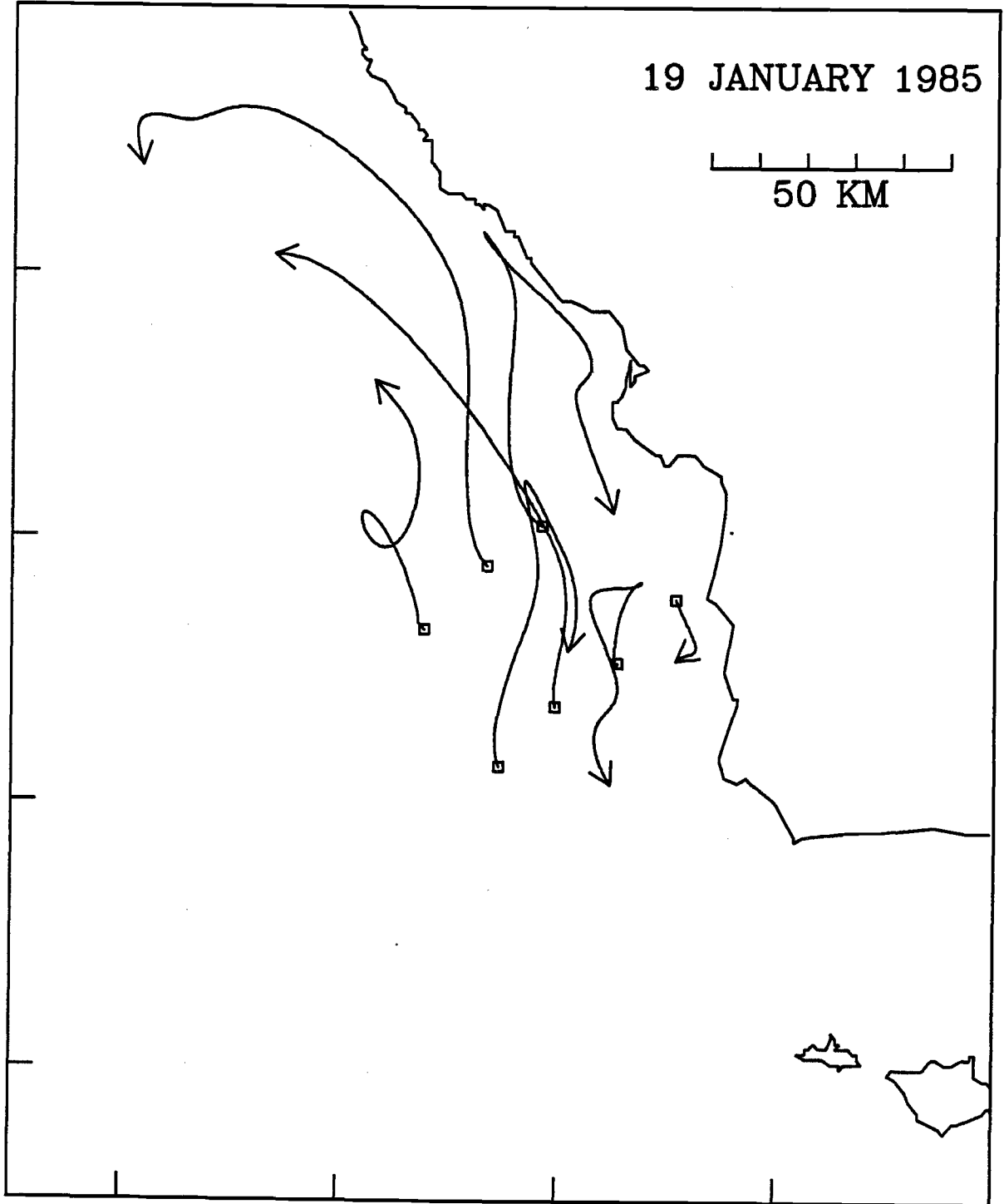
35

34

122

121

120



CRUISE 8501 DRIFTERS 8 - 13

36

24 JANUARY 1985

50 KM

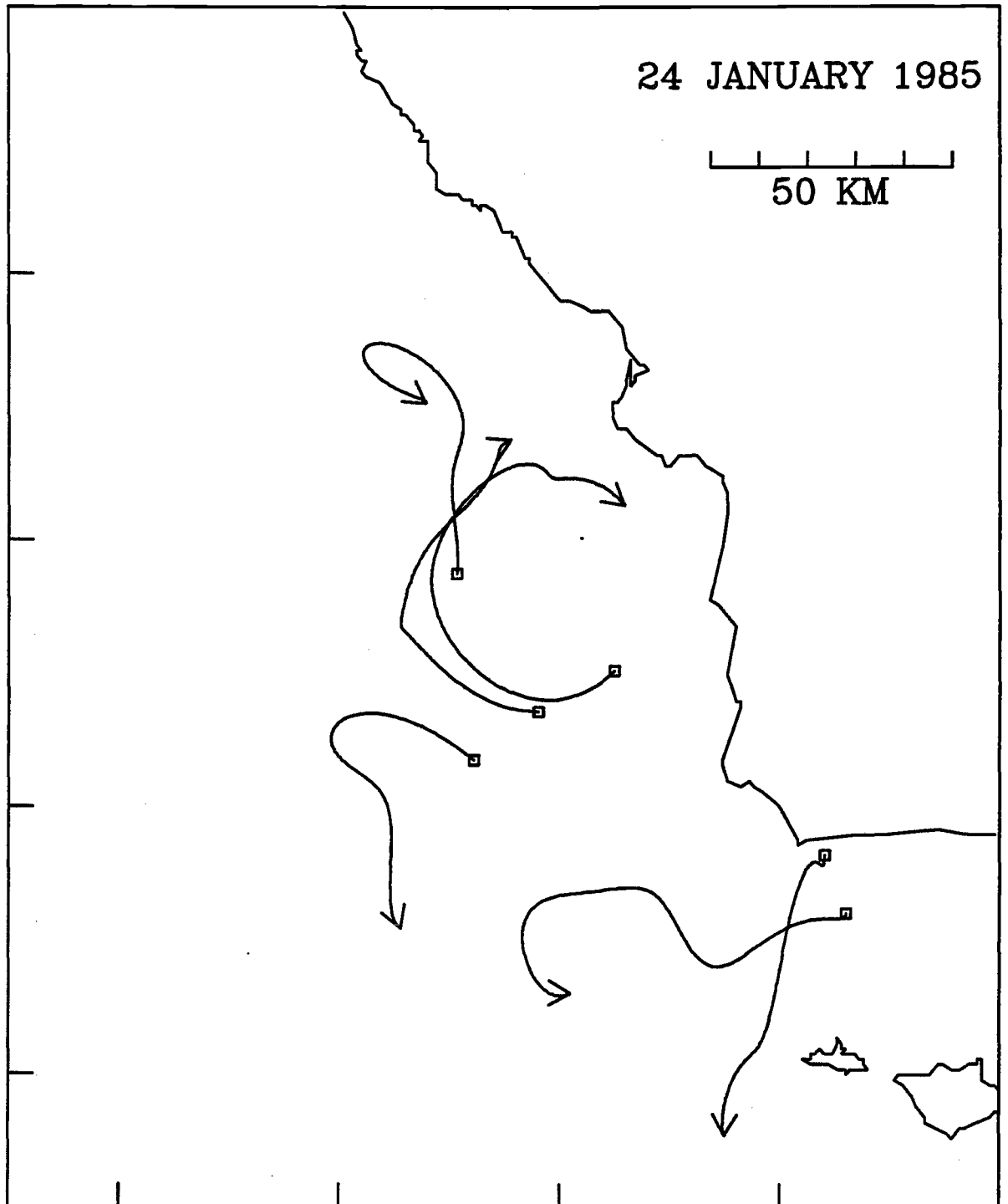
35

34

122

121

120



CRUISE 8501 DRIFTERS 14 - 19

36

29 JANUARY 1985

50 KM

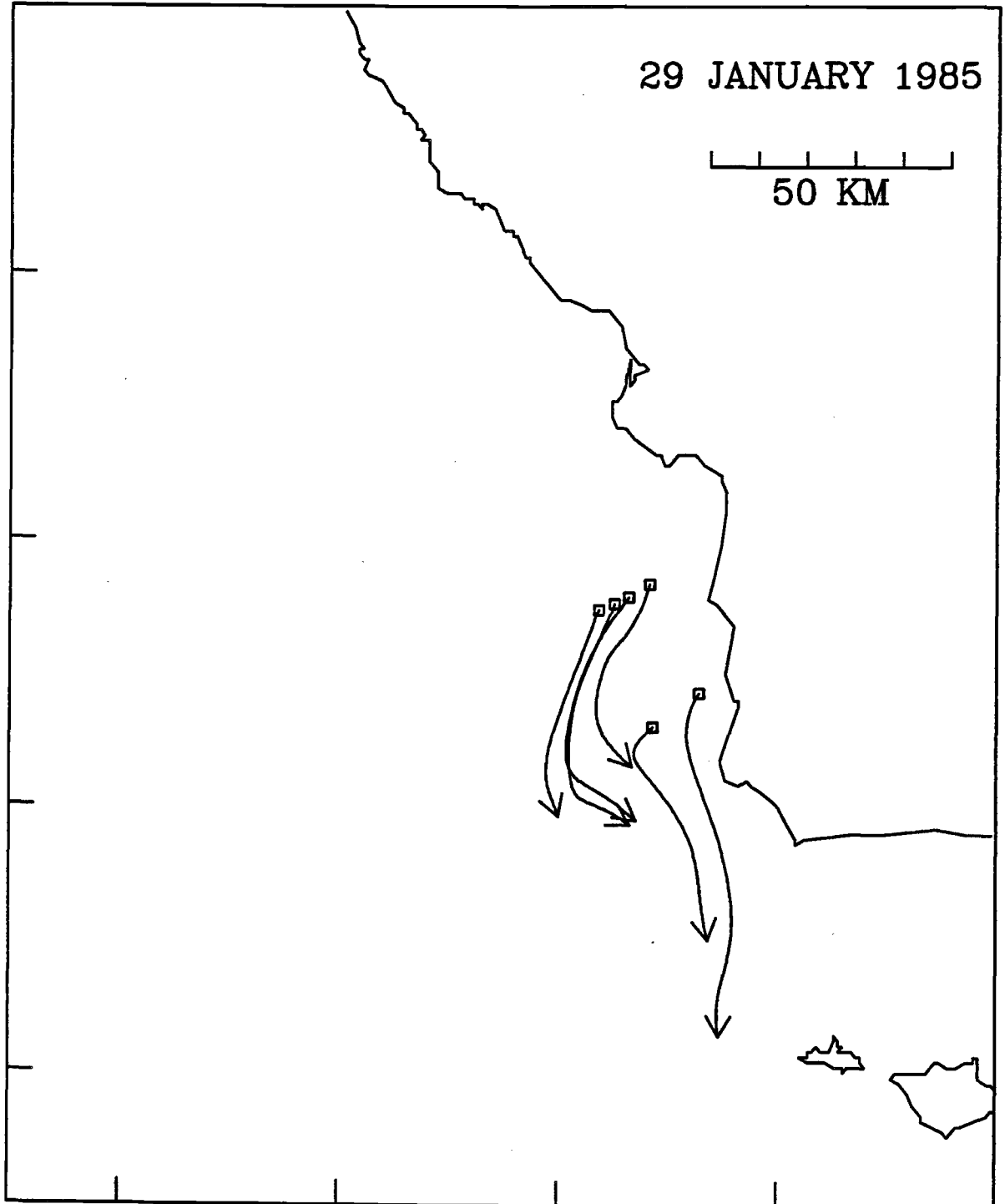
35

34

122

121

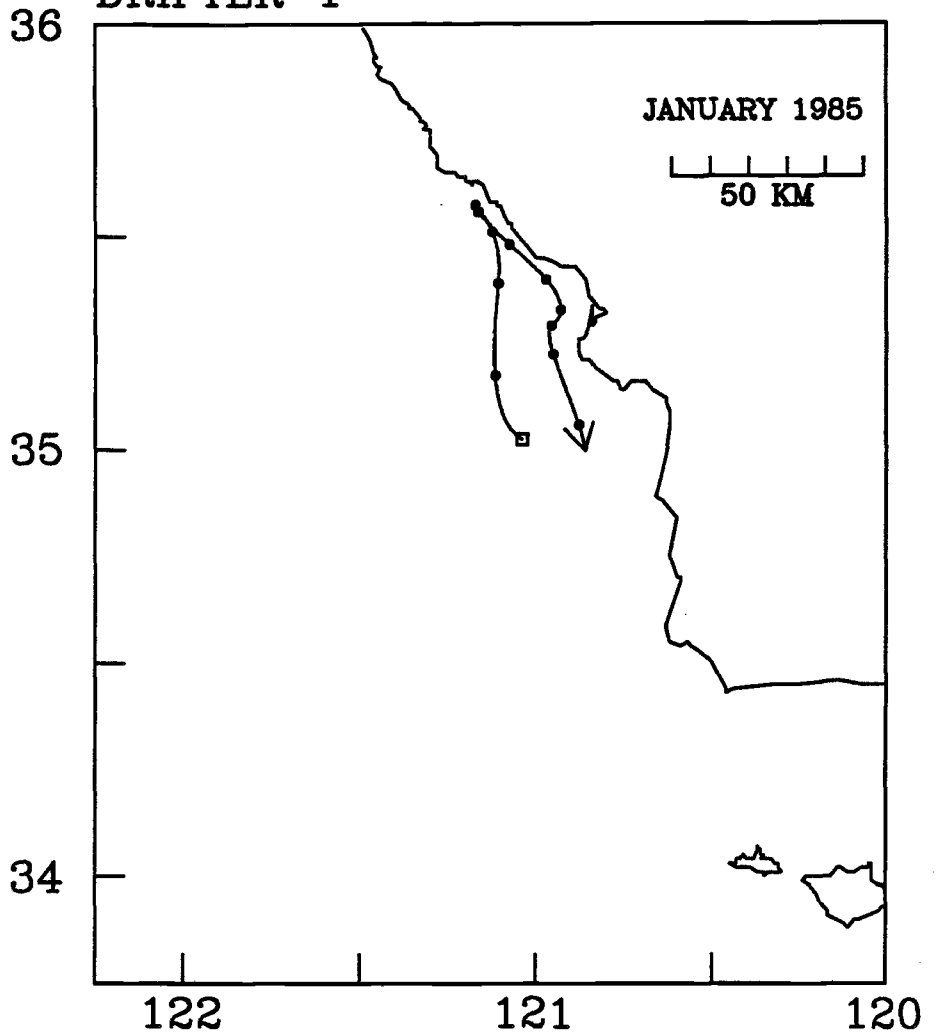
120



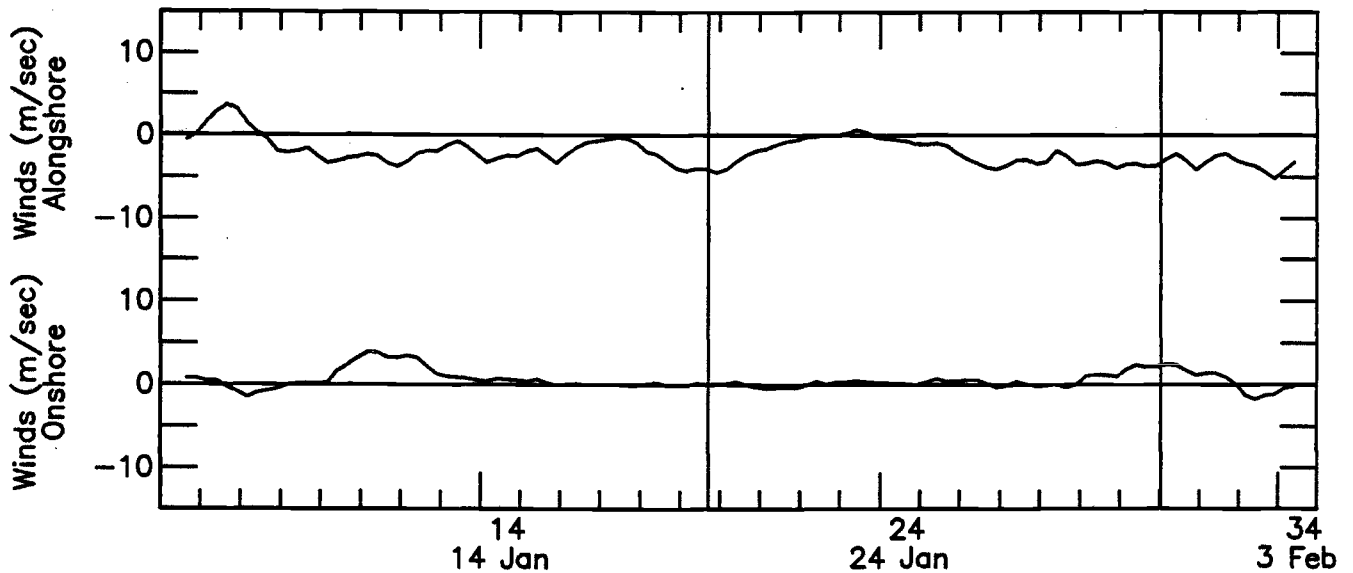
DRIFTER 1

TIME (days)	LAT (deg N)	LON (deg W)	SPEED (km/day)
19.71	35.04	121.04	
19.98	35.05	121.08	14.90
20.35	35.13	121.12	24.60
20.71	35.24	121.13	33.48
20.96	35.30	121.12	28.08
21.35	35.38	121.11	22.75
21.68	35.41	121.10	11.75
21.97	35.47	121.11	21.22
22.34	35.49	121.13	8.12
22.66	35.53	121.14	15.92
22.97	35.57	121.12	14.57
23.34	35.56	121.19	17.31
23.69	35.60	121.18	11.80
24.03	35.58	121.17	5.81
24.41	35.57	121.17	3.50
25.03	35.52	121.11	12.78
25.42	35.49	121.09	9.07
25.73	35.47	121.04	17.83
26.05	35.45	121.04	5.56
27.05	35.35	120.93	14.91
27.45	35.34	120.93	3.46
27.71	35.32	120.93	7.81
28.06	35.29	120.94	10.41
28.75	35.28	120.94	1.94
29.06	35.26	120.97	9.84
29.43	35.24	120.97	6.19
29.72	35.19	120.93	22.34
30.08	35.12	120.91	22.77
30.57	35.05	120.87	17.03
30.72	35.01	120.84	31.35
31.03	34.99	120.87	11.95

DRIFTER 1

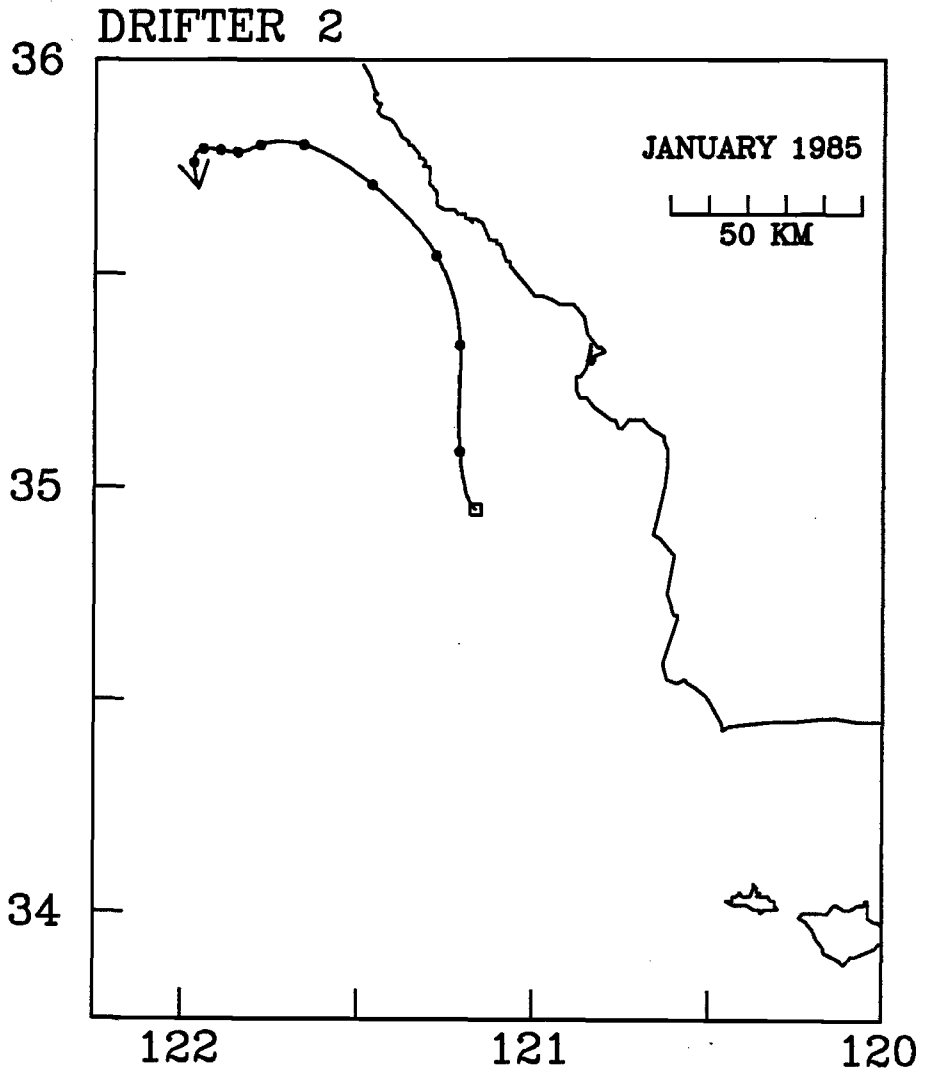


NDBC Buoy 46011

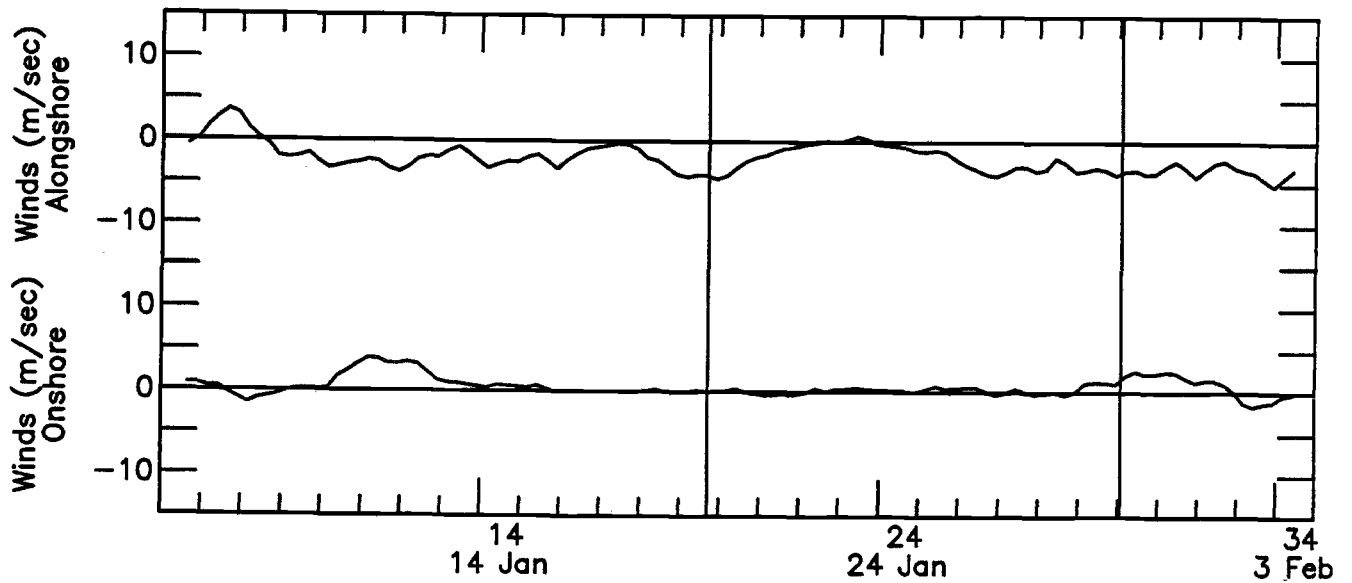


DRIFTER 2

TIME (days)	LAT (deg N)	LON (deg W)	SPEED (km/day)
19.71	34.94	121.17	
19.98	34.98	121.18	14.56
20.36	35.04	121.19	18.28
20.71	35.13	121.21	31.09
20.97	35.19	121.22	22.68
21.36	35.31	121.21	34.66
21.68	35.36	121.21	16.16
21.97	35.44	121.22	32.35
22.34	35.51	121.24	22.97
22.66	35.57	121.30	25.43
22.97	35.62	121.34	19.82
23.35	35.69	121.44	31.84
23.70	35.74	121.52	25.86
24.04	35.77	121.57	16.96
24.43	35.81	121.64	20.32
25.04	35.81	121.72	11.84
25.41	35.81	121.78	15.55
26.03	35.79	121.83	7.06
27.04	35.80	121.88	4.52
28.04	35.79	121.92	4.07
29.04	35.79	121.97	4.34
30.07	35.70	121.96	9.78



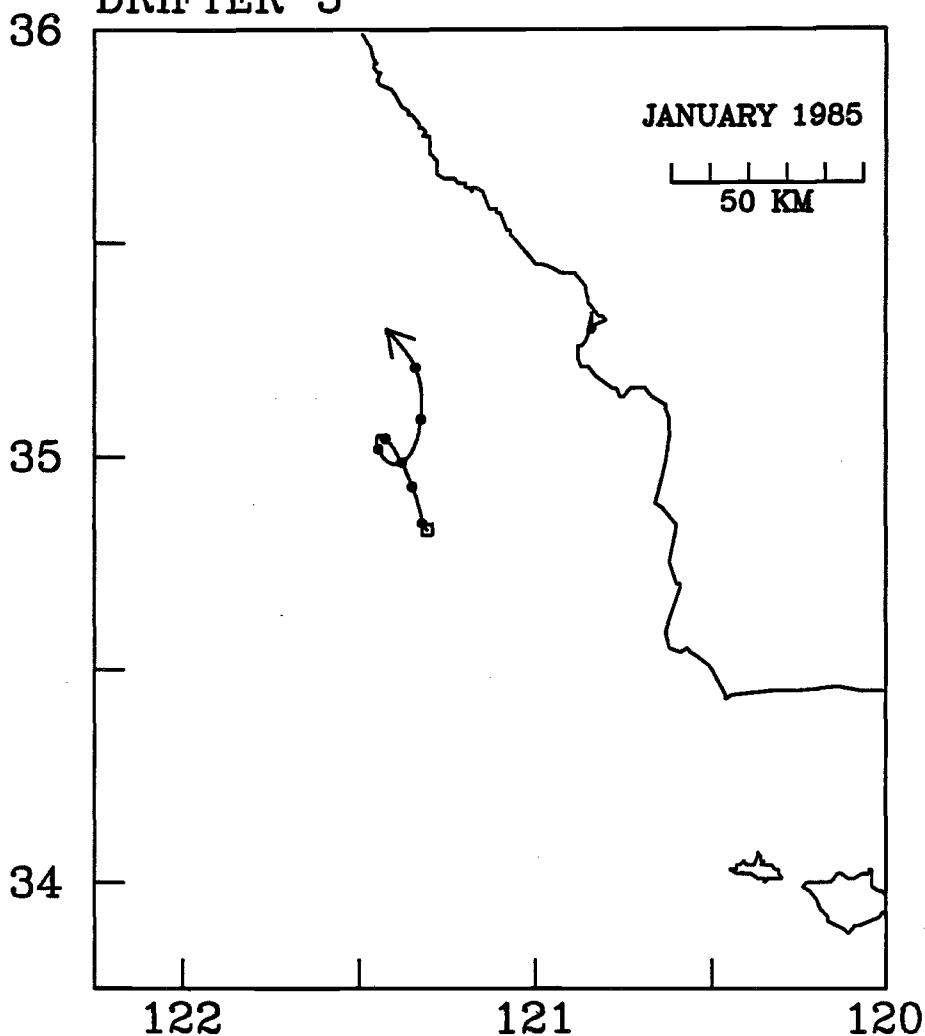
NDBC Buoy 46011



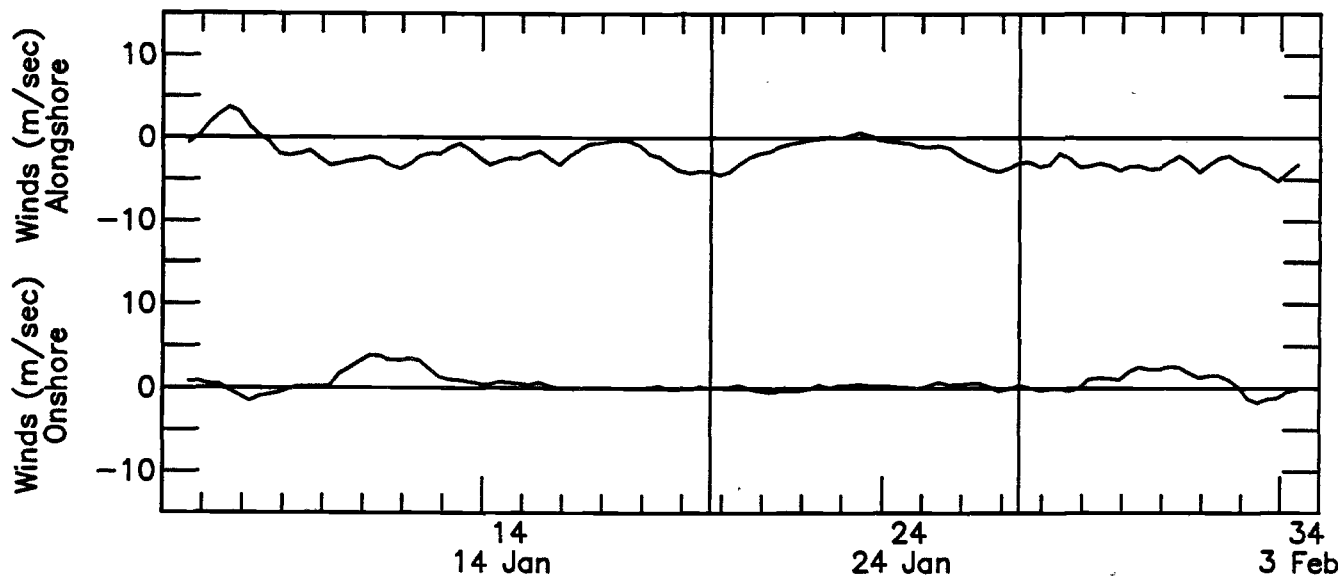
DRIFTER 3

DRIFTER 3

TIME (days)	LAT (deg N)	LON (deg W)	SPEED (km/day)
19.71	34.82	121.31	
19.99	34.85	121.31	11.60
20.36	34.83	121.33	5.15
20.72	34.85	121.34	5.12
20.97	34.87	121.33	12.51
21.37	34.91	121.34	9.27
21.69	34.94	121.35	11.68
21.99	34.99	121.37	22.23
22.36	35.04	121.44	22.40
22.69	35.04	121.44	1.32
22.99	35.05	121.45	5.69
23.36	35.03	121.46	4.52
23.72	34.99	121.44	13.97
24.01	34.99	121.39	14.73
24.39	34.99	121.40	2.22
24.70	35.00	121.36	14.13
25.01	35.03	121.34	12.50
25.38	35.08	121.35	15.20
25.69	35.13	121.32	20.13
26.01	35.14	121.34	6.64
26.42	35.21	121.32	18.44
26.72	35.24	121.36	16.75
27.02	35.26	121.37	10.05
27.43	35.31	121.43	17.77



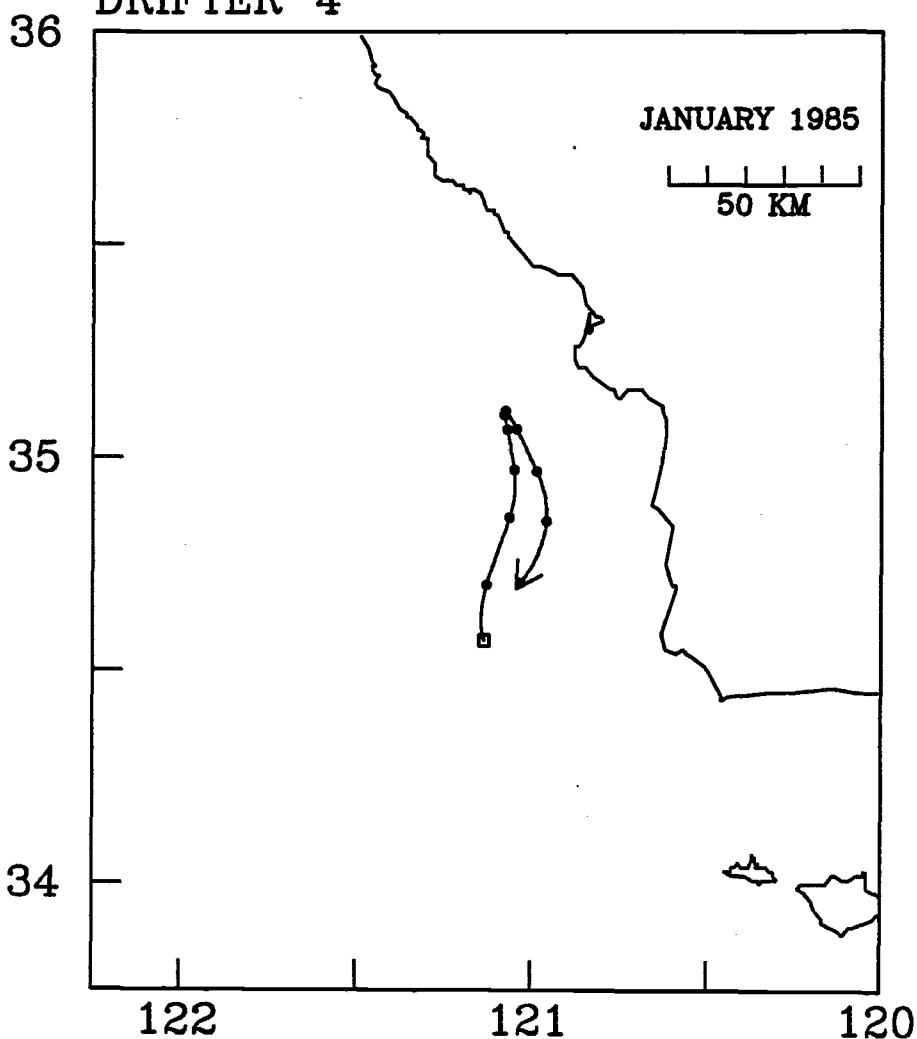
NDBC Buoy 46011



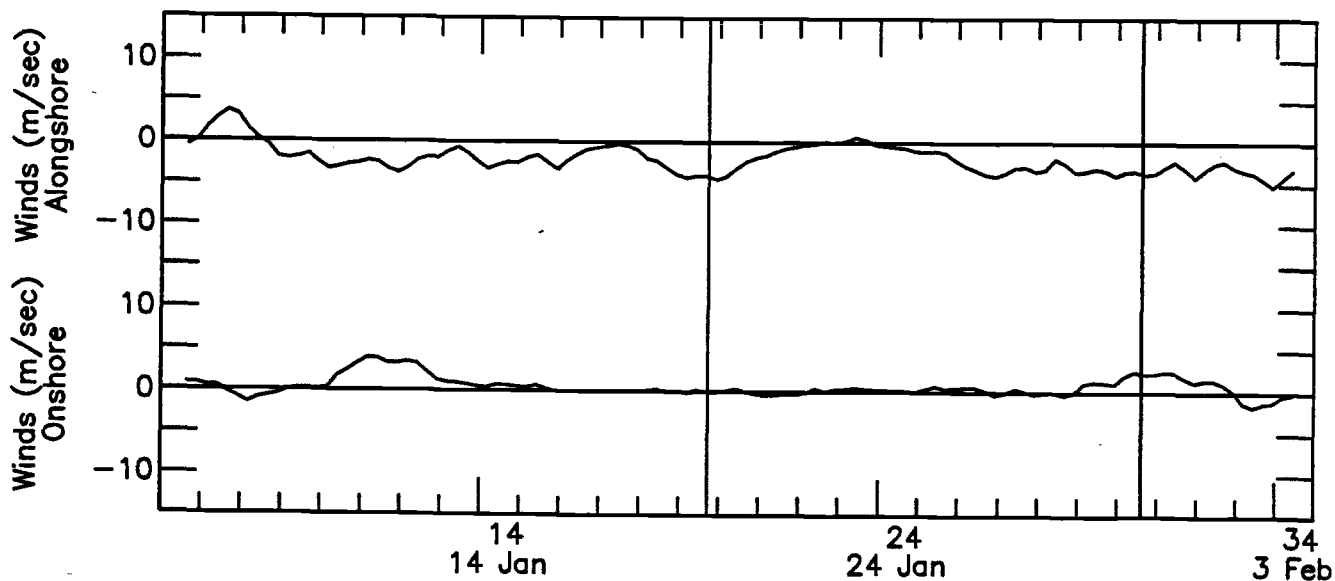
DRIFTER 4

TIME (days)	LAT (deg N)	LON (deg W)	SPEED (km/day)
19.72	34.57	121.13	
19.99	34.61	121.16	15.99
20.37	34.67	121.13	20.67
20.72	34.74	121.13	20.25
20.98	34.79	121.10	25.65
21.37	34.85	121.07	18.40
21.70	34.88	121.05	11.57
21.99	34.92	121.05	14.63
22.37	34.97	121.06	13.58
22.69	35.01	121.05	14.66
22.99	35.01	121.07	5.65
23.37	35.06	121.07	12.62
23.72	35.10	121.08	14.94
24.40	35.12	121.08	3.25
24.70	35.12	121.08	2.20
25.01	35.08	121.06	17.69
25.39	35.11	121.09	12.23
25.70	35.13	121.10	8.25
26.01	35.11	121.09	7.69
26.43	35.13	121.08	4.58
26.73	35.11	121.08	5.55
27.01	35.10	121.03	13.98
27.38	35.09	121.06	7.55
27.69	35.06	121.04	11.35
28.01	35.01	121.00	20.38
28.39	34.99	121.02	7.04
28.74	34.94	120.96	21.70
28.96	34.90	120.95	21.38
29.33	34.87	120.98	11.76
29.64	34.85	120.96	9.72
29.70	34.83	120.95	30.96
29.96	34.77	120.96	28.22
30.09	34.74	120.99	26.08
30.36	34.72	121.03	15.05
30.38	34.72	121.03	15.00
30.42	34.71	121.03	18.67
30.46	34.71	121.03	15.69
30.50	34.70	121.03	15.20
30.54	34.69	121.03	20.65
30.60	34.69	121.03	20.34

DRIFTER 4



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DRIFTER 5

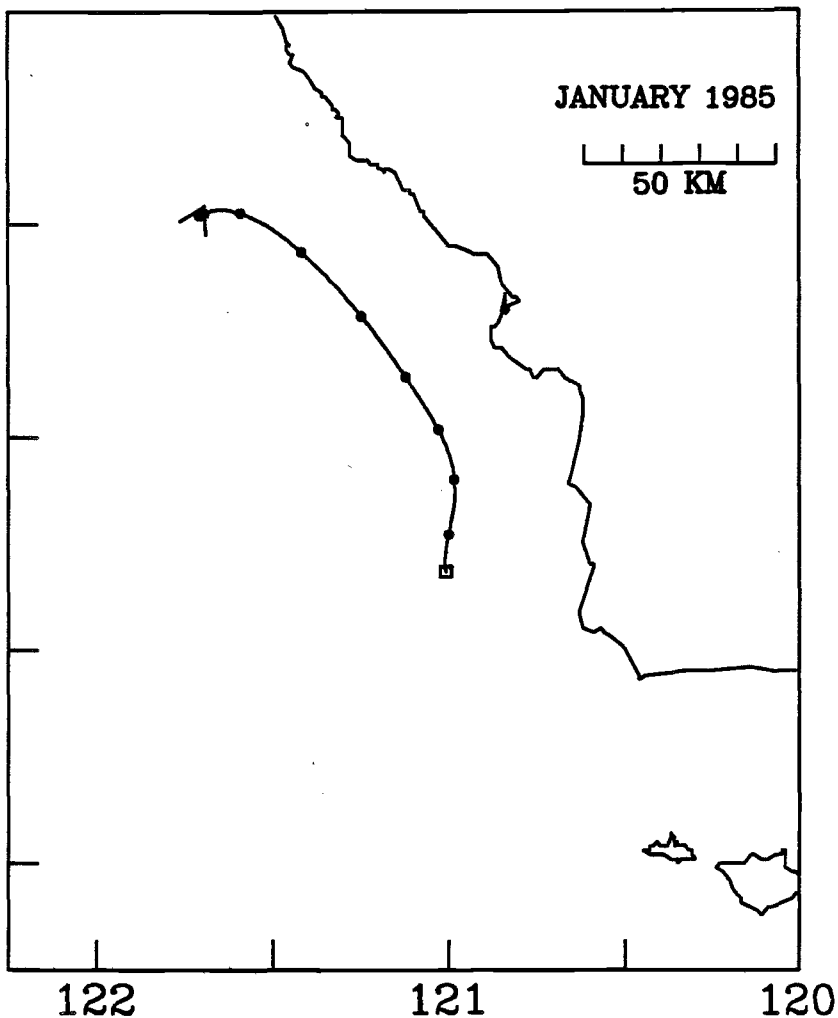
TIME (days)	LAT (deg N)	LON (deg W)	SPEED (km/day)
19.73	34.68	121.00	
20.00	34.70	121.00	8.22
20.37	34.74	121.01	13.32
20.72	34.78	121.00	13.35
20.98	34.83	120.98	22.61
21.37	34.88	120.97	14.10
21.70	34.91	120.97	8.27
21.99	34.95	121.00	17.49
22.37	34.99	121.02	14.27
22.70	35.04	121.06	17.20
23.00	35.06	121.07	11.57
23.38	35.13	121.11	21.48
23.72	35.19	121.14	19.78
24.02	35.20	121.17	8.85
24.40	35.26	121.24	26.00
24.71	35.33	121.30	31.13
25.00	35.36	121.32	11.35
25.40	35.43	121.41	29.25
25.72	35.47	121.47	23.62
26.02	35.49	121.50	11.15
27.03	35.54	121.67	15.84
28.03	35.52	121.71	4.67
29.03	35.55	121.69	3.57

DRIFTER 5

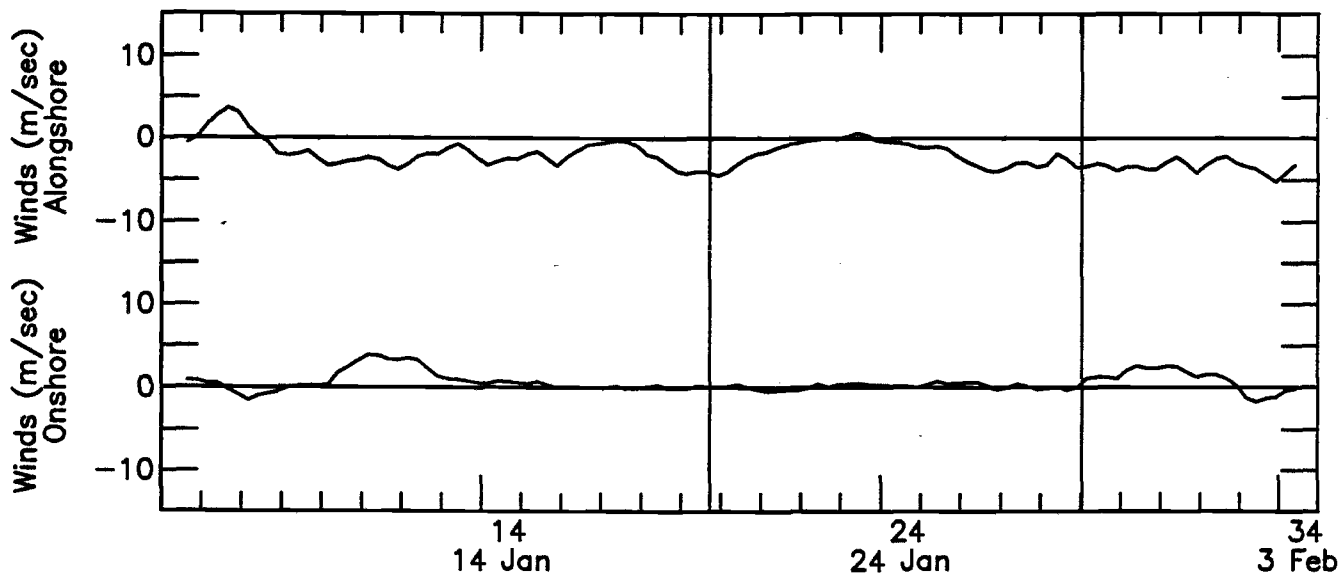
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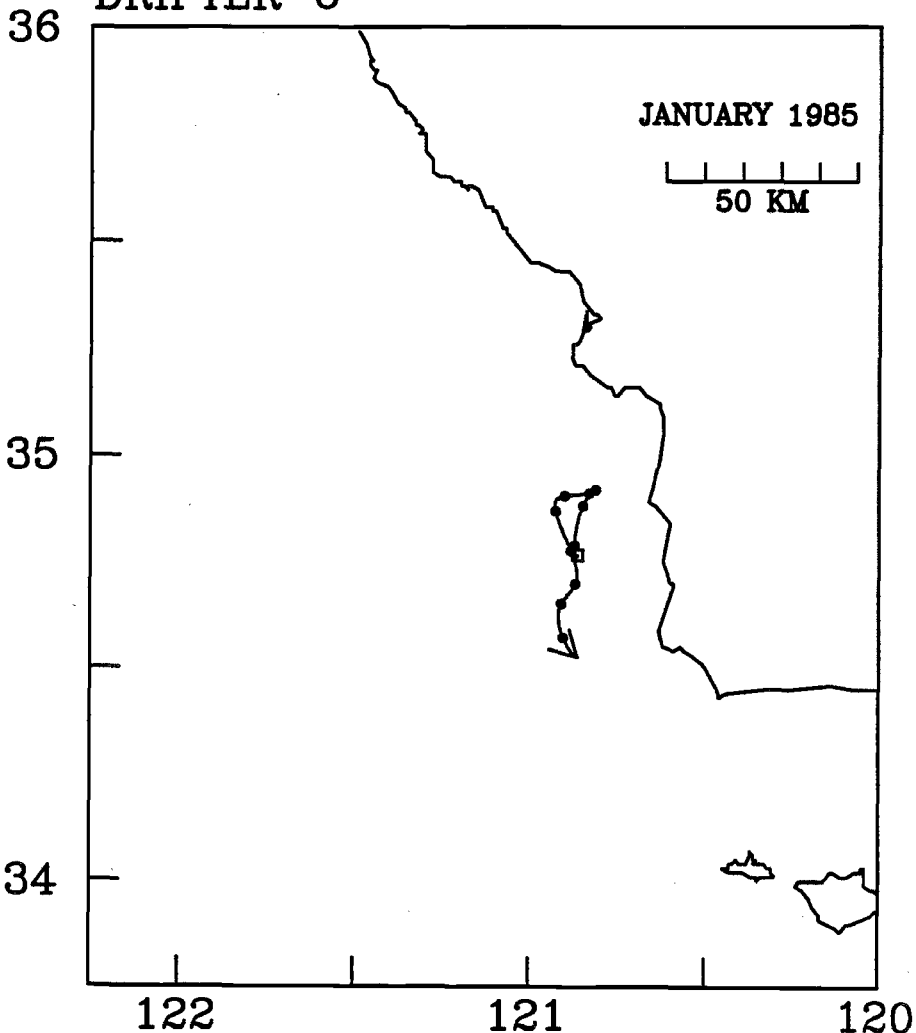
NDBC Buoy 46011



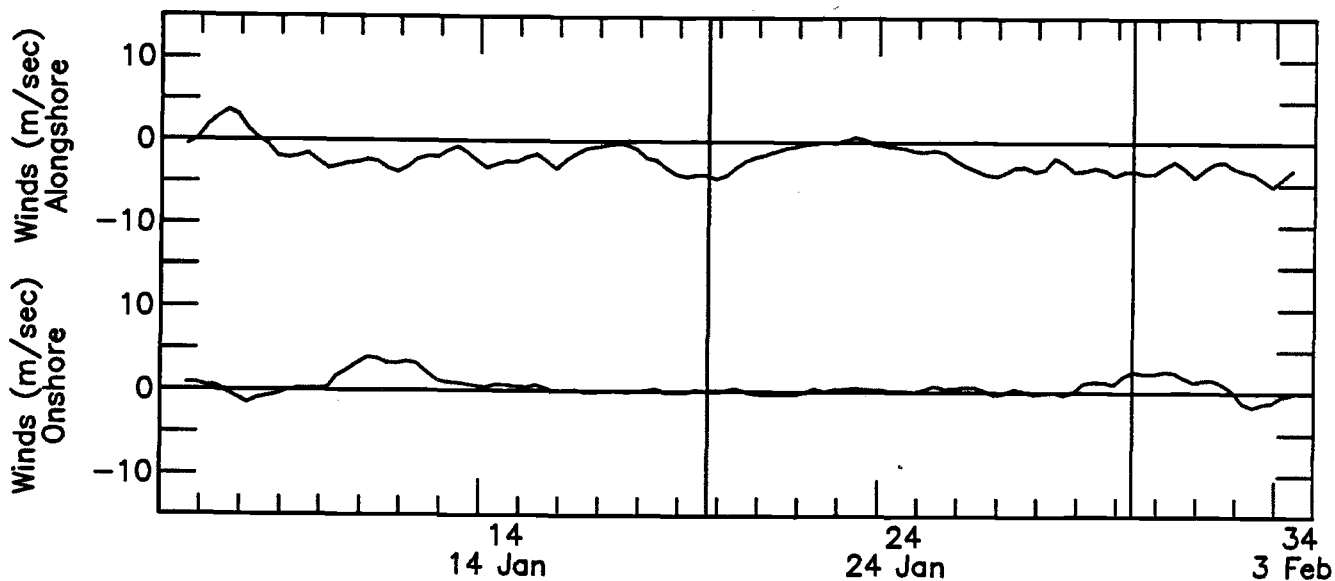
DRIFTER 6

TIME (days)	LAT (deg N)	LON (deg W)	SPEED (km/day)
19.73	34.77	120.87	
20.00	34.76	120.86	6.53
20.38	34.78	120.90	11.39
20.73	34.82	120.86	16.14
20.98	34.84	120.85	11.62
21.38	34.87	120.86	8.71
21.70	34.90	120.85	11.50
22.00	34.92	120.83	7.86
22.38	34.92	120.82	1.70
22.70	34.93	120.81	6.76
23.00	34.92	120.79	5.08
23.39	34.92	120.83	9.01
23.73	34.92	120.85	4.07
23.96	34.91	120.86	8.14
24.33	34.92	120.89	7.47
24.64	34.91	120.90	3.99
24.96	34.89	120.91	8.08
25.32	34.87	120.93	6.37
25.64	34.88	120.92	3.58
25.95	34.82	120.92	21.01
26.35	34.79	120.91	9.86
26.65	34.76	120.88	13.19
26.96	34.72	120.85	17.88
27.32	34.71	120.85	3.36
27.63	34.70	120.87	7.31
27.96	34.66	120.89	12.81
28.32	34.66	120.92	7.32
28.68	34.65	120.91	4.20
28.97	34.60	120.90	19.96
29.36	34.58	120.94	10.91
29.69	34.56	120.89	16.39
29.98	34.51	120.85	21.86
30.39	34.52	120.88	6.00

DRIFTER 6



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DRIFTER 7

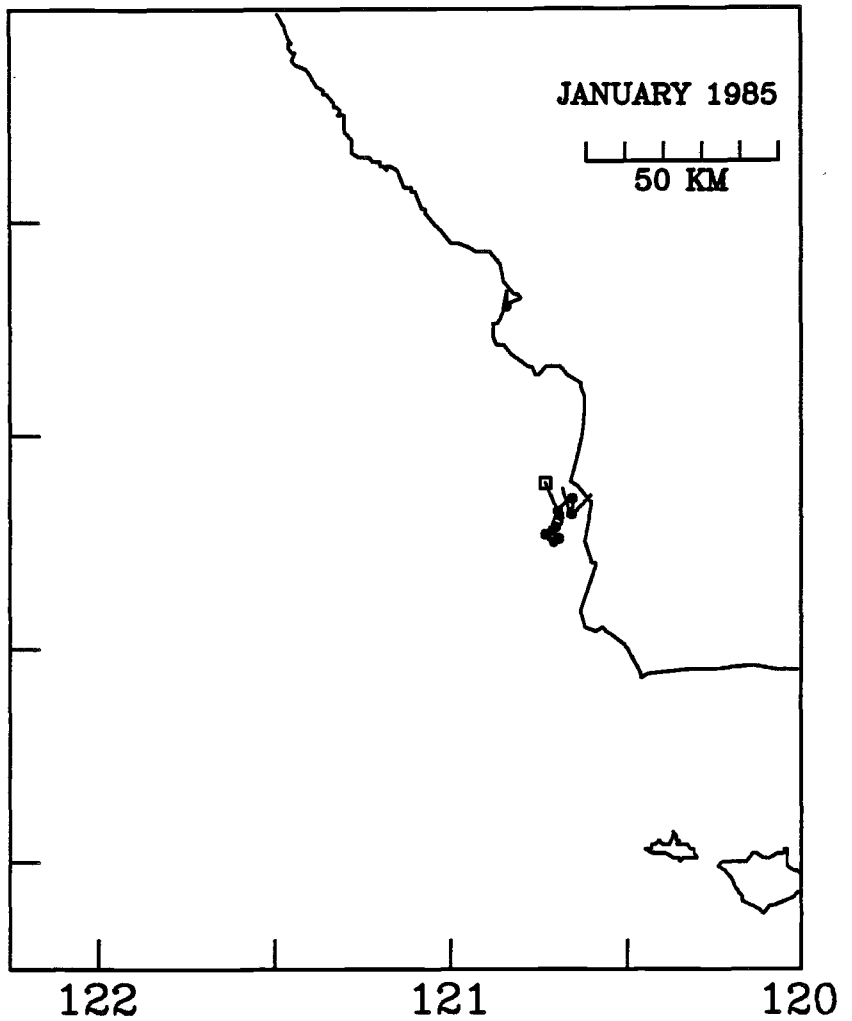
TIME (days)	LAT (deg N)	LON (deg W)	SPEED (km/day)
19.73	34.87	120.72	
20.00	34.88	120.73	6.30
20.39	34.81	120.71	20.52
20.74	34.79	120.68	11.23
21.38	34.78	120.69	1.96
21.70	34.78	120.71	4.56
22.00	34.80	120.72	6.93
22.39	34.75	120.76	16.06
22.71	34.76	120.73	7.30
23.01	34.76	120.72	3.76
23.39	34.75	120.73	2.40
23.74	34.74	120.70	8.99
23.96	34.75	120.68	8.16
24.34	34.75	120.69	2.42
24.64	34.77	120.69	5.93
24.96	34.77	120.69	1.99
25.33	34.77	120.73	8.02
25.65	34.78	120.74	3.90
25.96	34.77	120.71	8.22
26.36	34.81	120.68	12.19
26.66	34.84	120.69	10.64
26.95	34.85	120.66	7.63
27.32	34.85	120.67	0.97
27.62	34.84	120.66	4.10
28.32	34.82	120.66	3.37
28.67	34.81	120.65	5.29

DRIFTER 7

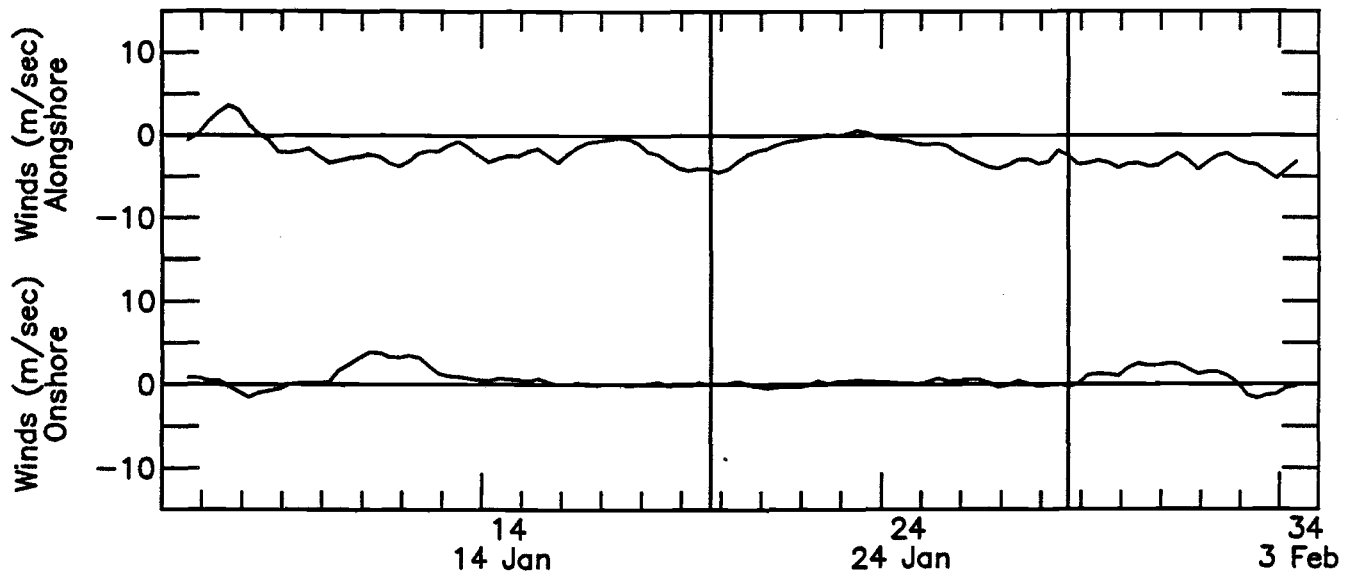
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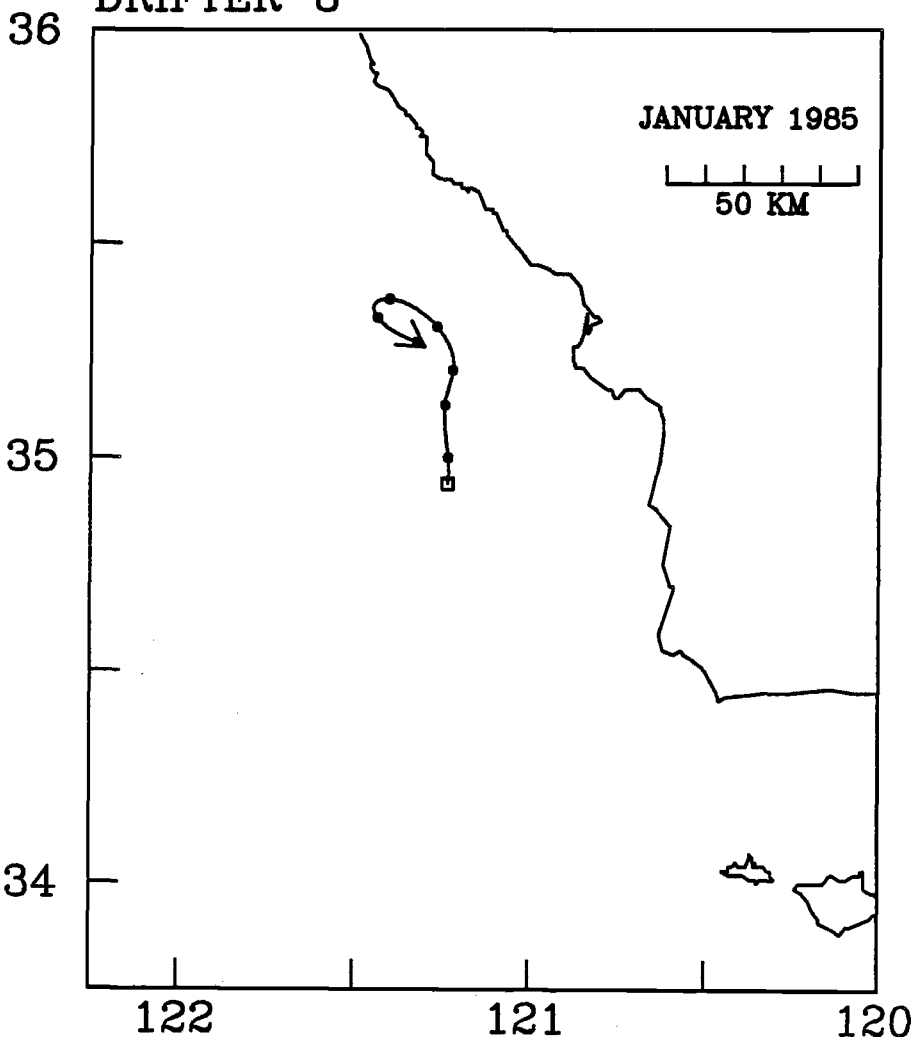
NDBC Buoy 46011



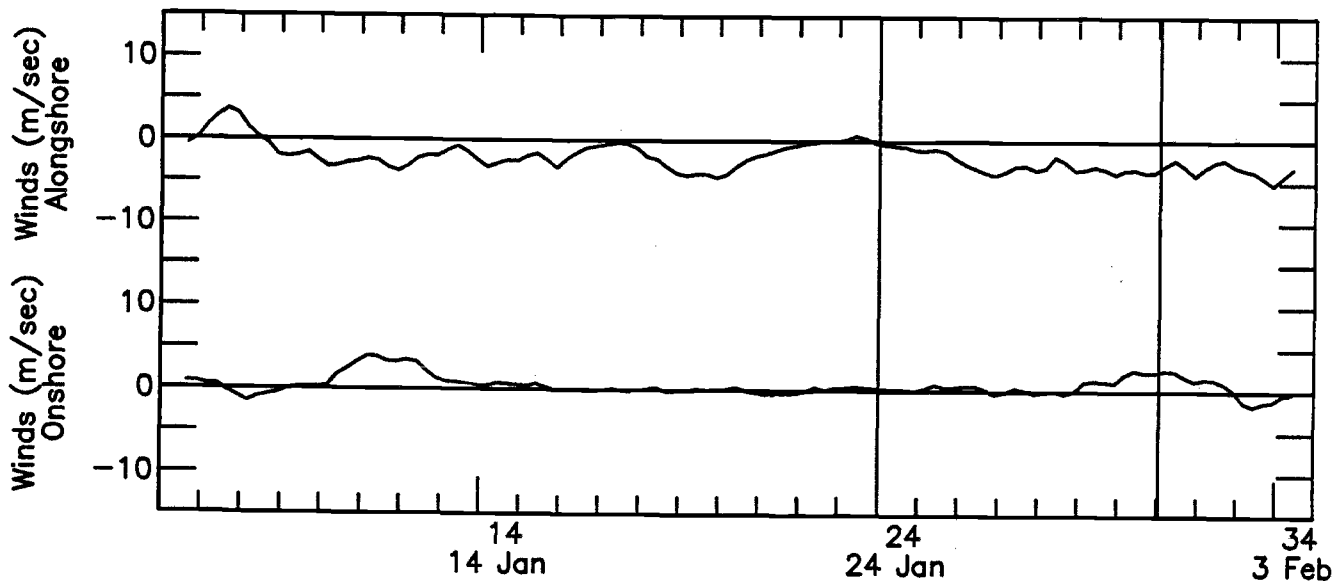
DRIFTER 8

DRIFTER 8

TIME (days)	LAT (deg N)	LON (deg W)	SPEED (km/day)
24.01	34.94	121.23	
24.39	34.98	121.25	14.20
24.89	35.04	121.23	20.45
25.01	35.05	121.23	3.83
25.38	35.11	121.23	19.32
25.70	35.16	121.25	17.16
26.01	35.15	121.24	2.49
26.42	35.21	121.22	16.20
26.72	35.22	121.24	5.83
27.01	35.25	121.21	14.04
27.39	35.29	121.25	16.11
27.70	35.33	121.28	15.42
28.02	35.35	121.33	16.20
28.40	35.39	121.40	19.38
29.02	35.34	121.45	11.84
29.42	35.34	121.45	2.27
30.05	35.30	121.36	14.51
31.05	35.26	121.31	6.41



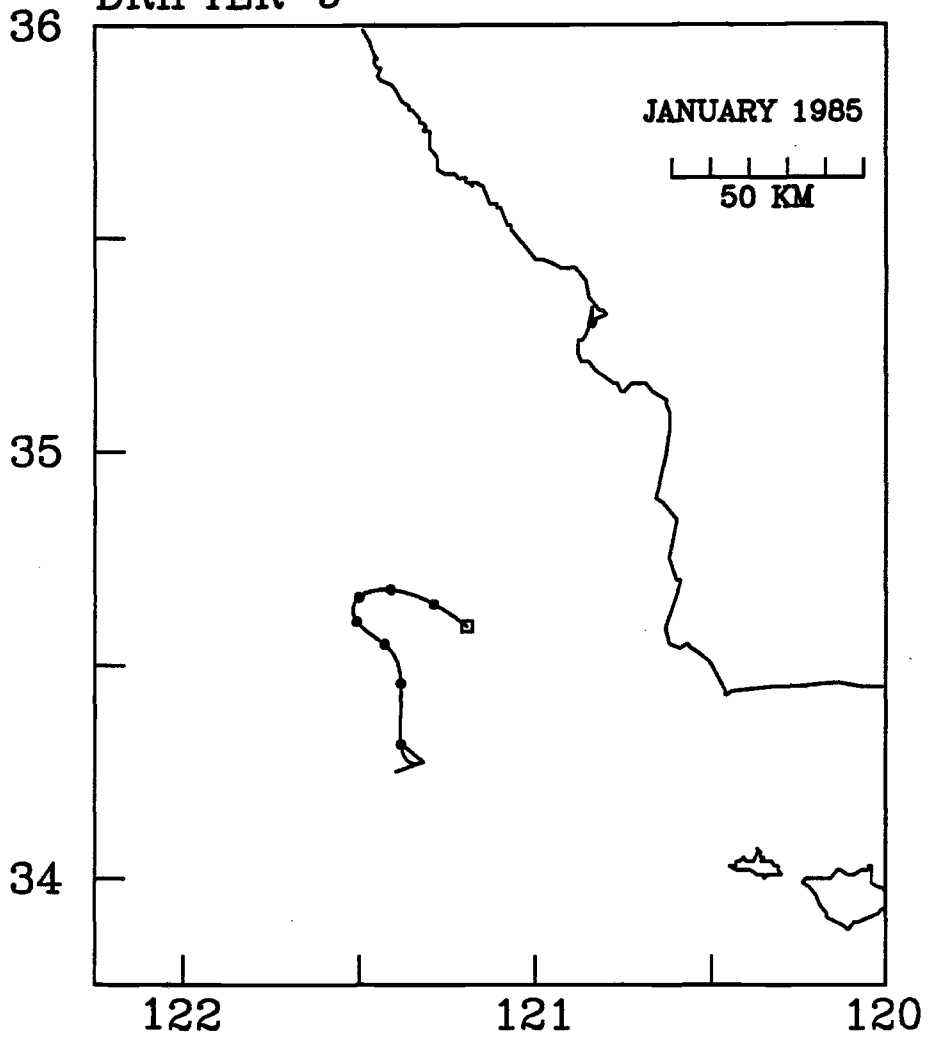
NDBC Buoy 46011



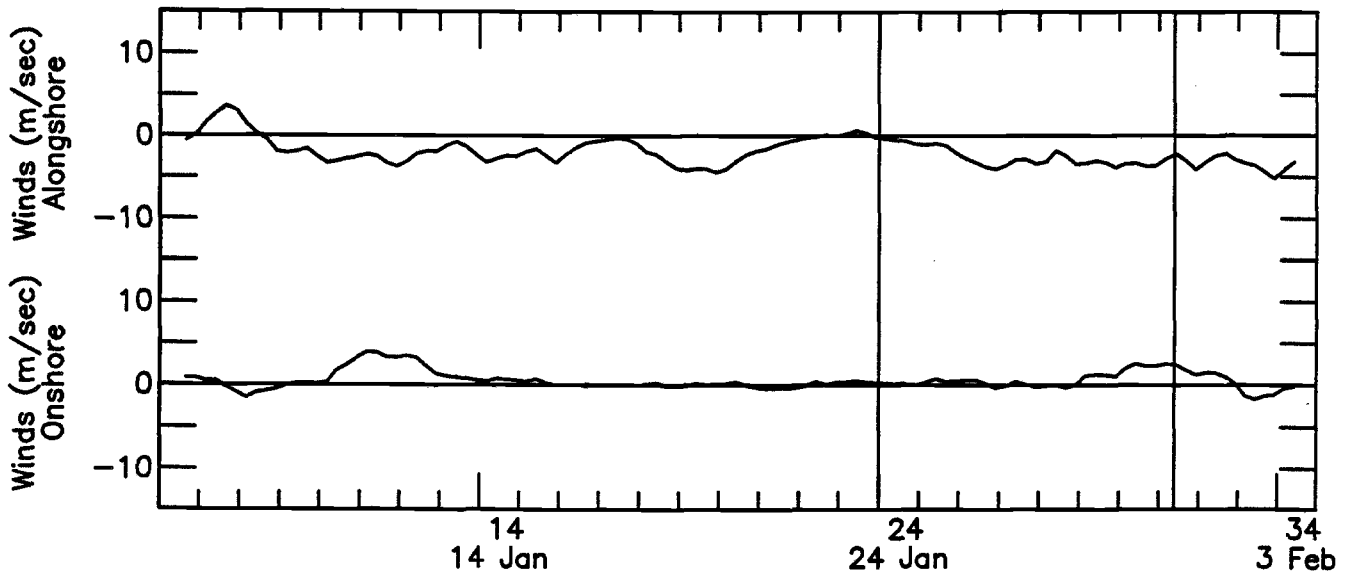
DRIFTER 9

TIME (days)	LAT (deg N)	LON (deg W)	SPEED (km/day)
24.00	34.60	121.20	
24.38	34.64	121.28	22.59
24.68	34.66	121.32	16.12
25.00	34.67	121.34	7.11
25.37	34.67	121.40	14.14
25.68	34.67	121.44	10.71
25.99	34.68	121.45	5.76
26.39	34.67	121.50	11.72
26.70	34.66	121.50	2.98
26.99	34.65	121.51	7.71
27.36	34.61	121.53	12.63
27.67	34.57	121.51	12.45
28.00	34.57	121.49	8.01
28.36	34.56	121.45	8.48
28.72	34.56	121.38	19.28
29.00	34.49	121.37	27.36
29.40	34.48	121.42	10.74
29.68	34.43	121.38	24.25
30.02	34.36	121.39	22.40
30.43	34.35	121.40	4.47
30.98	34.26	121.34	19.53
31.39	34.28	121.32	5.10

DRIFTER 9

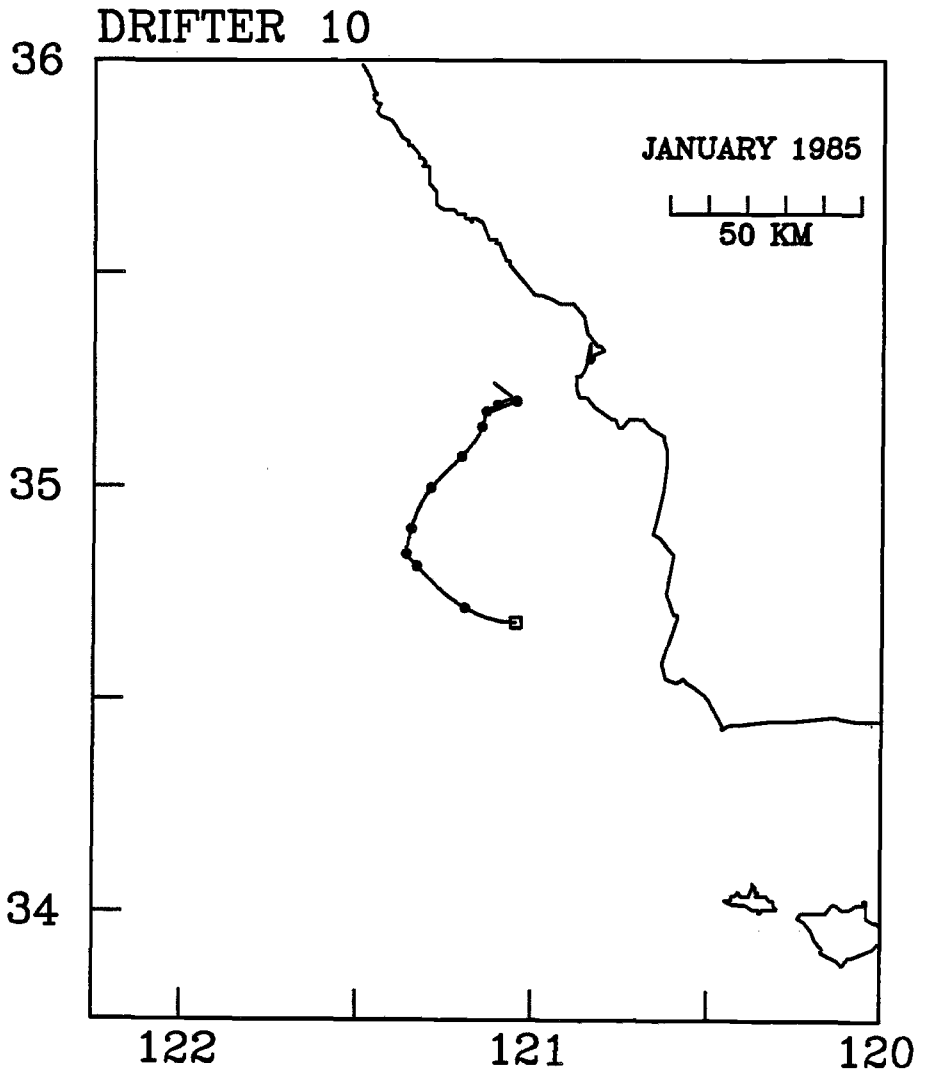


NDBC Buoy 46011

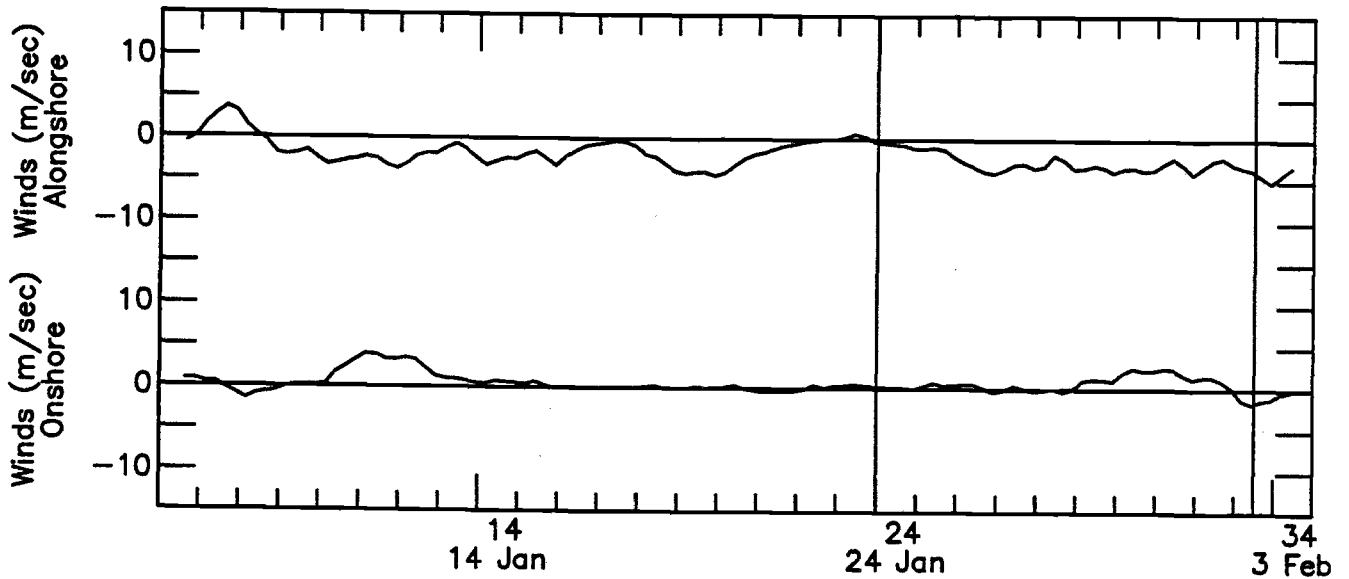


DRIFTER 10

TIME (days)	LAT (deg N)	LON (deg W)	SPEED (km/day)
24.00	34.88	121.07	
24.37	34.70	121.16	23.11
24.68	34.72	121.24	27.33
25.00	34.76	121.29	18.12
25.36	34.79	121.32	12.37
25.68	34.84	121.32	19.32
25.99	34.83	121.36	12.68
26.40	34.82	121.38	3.88
26.71	34.85	121.36	10.79
27.00	34.85	121.35	2.39
27.37	34.88	121.35	8.39
27.67	34.93	121.35	17.11
28.00	34.94	121.33	7.12
28.37	34.99	121.32	15.30
28.73	35.04	121.25	24.05
29.01	35.00	121.23	18.53
29.41	35.08	121.26	23.45
29.72	35.11	121.19	23.29
30.03	35.08	121.16	14.68
30.56	35.17	121.14	19.43
30.72	35.16	121.13	11.48
31.04	35.18	121.14	8.04
31.86	35.20	121.14	3.65
31.96	35.15	121.13	19.06
32.40	35.21	121.11	16.37
32.72	35.21	121.08	7.37
33.50	35.20	121.05	4.05



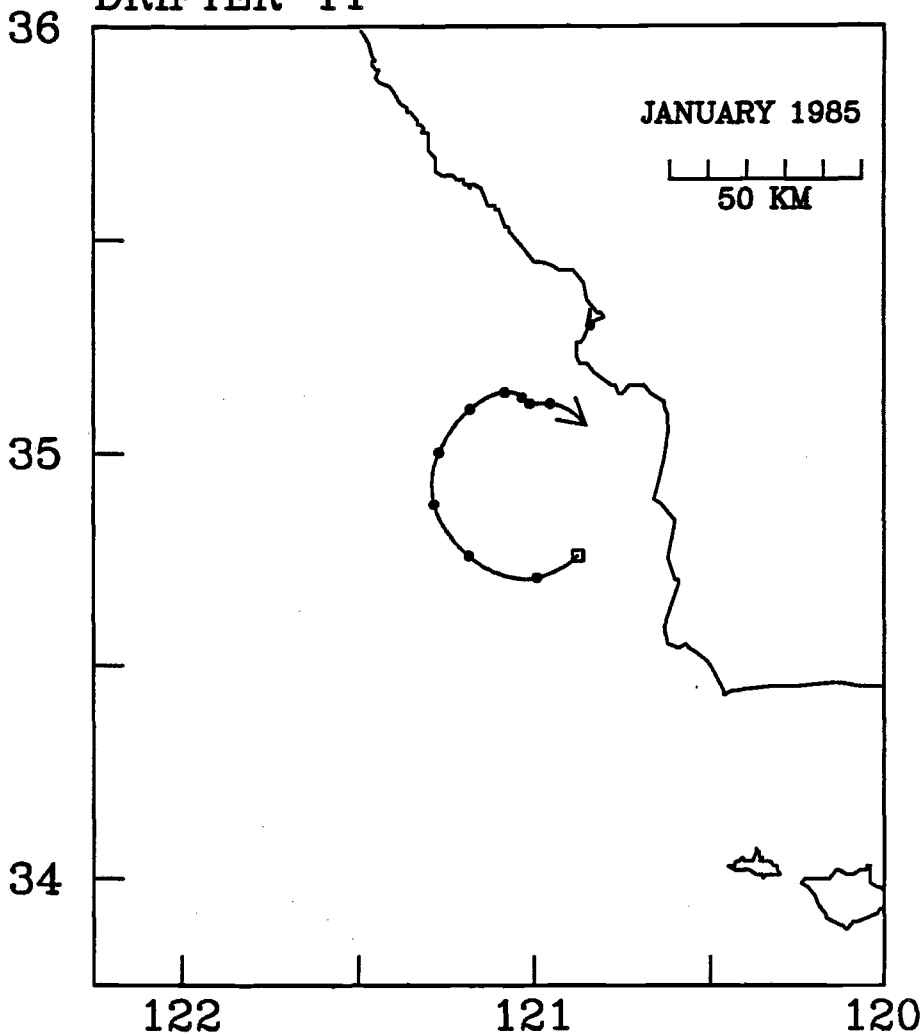
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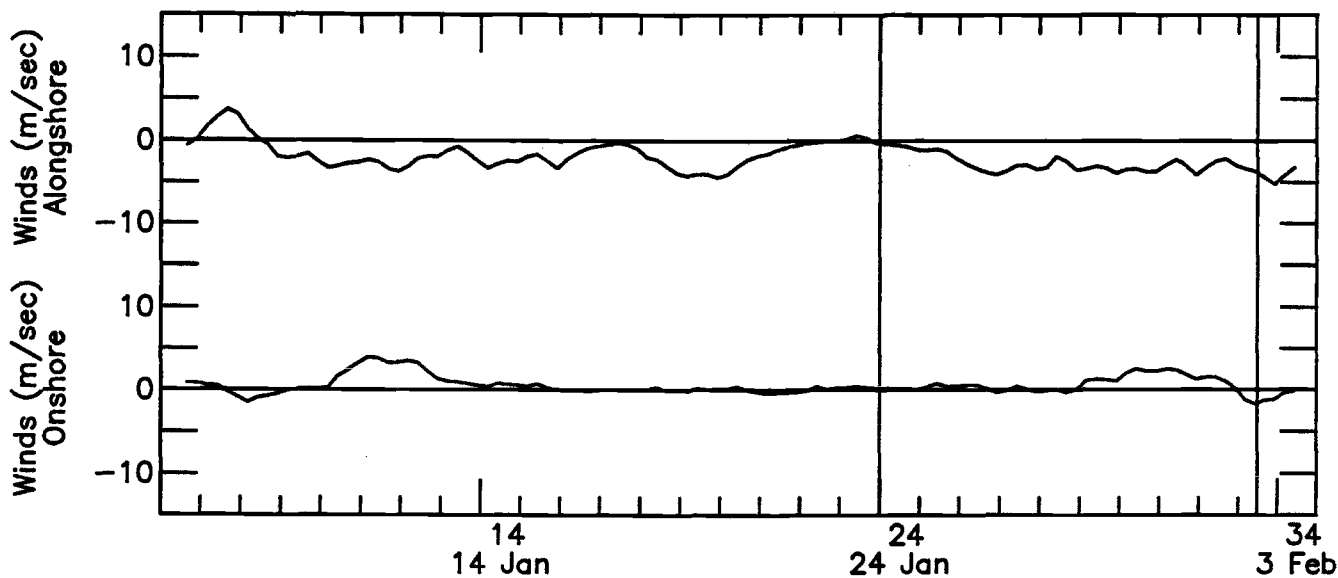
DRIFTER 11

DRIFTER 11

TIME (days)	LAT (deg N)	LON (deg W)	SPEED (km/day)
23.99	34.74	120.89	
24.37	34.72	120.96	18.86
24.67	34.70	121.02	19.92
24.99	34.69	121.09	18.90
25.36	34.72	121.18	23.13
25.68	34.79	121.22	28.58
26.00	34.81	121.26	11.35
26.40	34.86	121.28	14.15
26.71	34.90	121.28	17.42
27.00	34.94	121.26	15.18
27.37	34.98	121.29	11.63
27.68	35.03	121.27	21.31
28.01	35.04	121.25	5.40
28.38	35.11	121.21	24.20
28.73	35.14	121.14	18.48
29.02	35.11	121.10	19.58
29.42	35.17	121.12	19.53
29.72	35.15	121.07	17.88
30.04	35.11	121.04	14.77
30.56	35.15	121.05	8.59
30.72	35.14	121.02	17.54
31.04	35.13	121.03	5.19
31.64	35.15	121.00	5.62
31.95	35.08	120.98	26.55
32.40	35.15	120.98	17.35
32.72	35.12	120.93	18.70
33.49	35.06	120.85	12.19



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DRIFTER 12

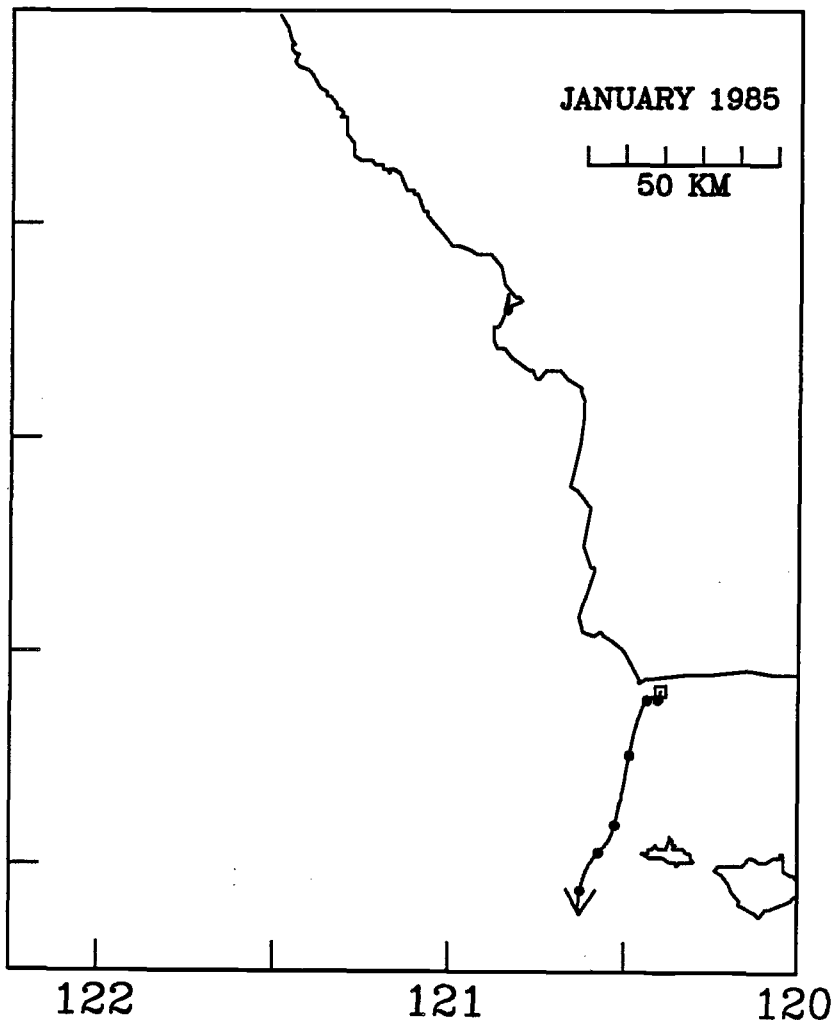
TIME (days)	LAT (deg N)	LON (deg W)	SPEED (km/day)
23.98	34.41	120.39	
24.36	34.40	120.42	6.14
24.66	34.41	120.42	3.18
24.97	34.38	120.39	12.95
25.34	34.38	120.43	10.76
25.66	34.39	120.46	8.84
25.97	34.37	120.45	8.21
26.37	34.30	120.47	20.09
26.68	34.21	120.50	31.23
26.97	34.18	120.51	14.43
27.34	34.10	120.51	22.68
27.64	34.08	120.55	13.57
27.97	34.06	120.53	9.92
28.34	34.04	120.57	11.10
28.69	34.04	120.58	2.35
28.98	33.98	120.59	24.53
29.38	33.96	120.64	14.17
30.00	33.88	120.62	14.05

DRIFTER 12

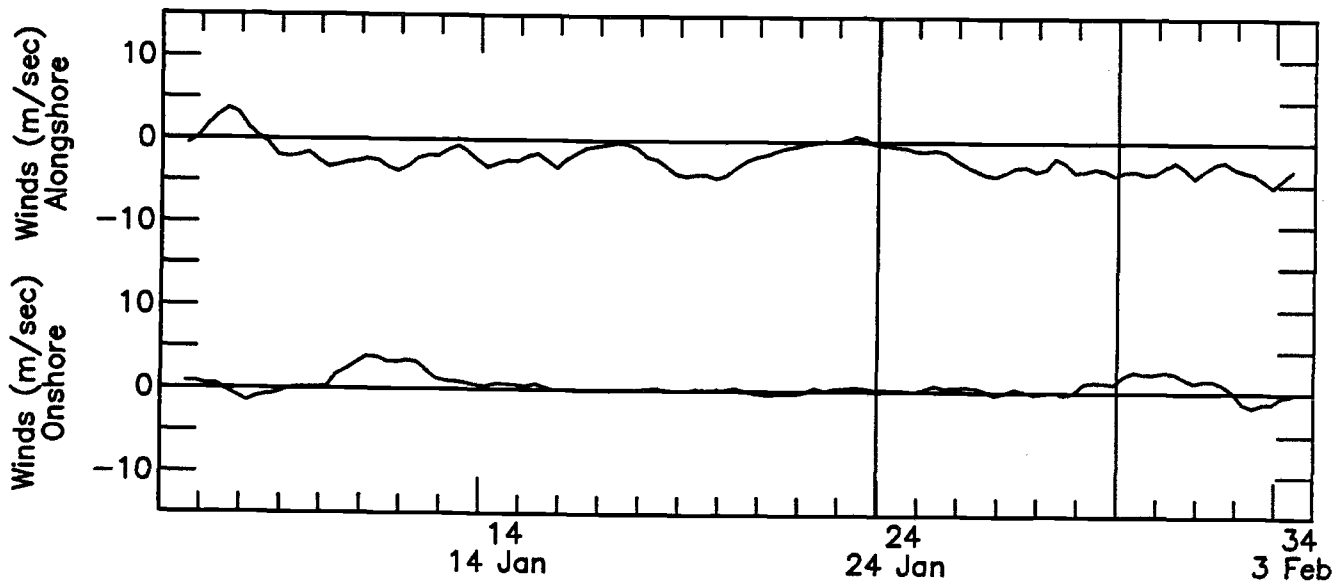
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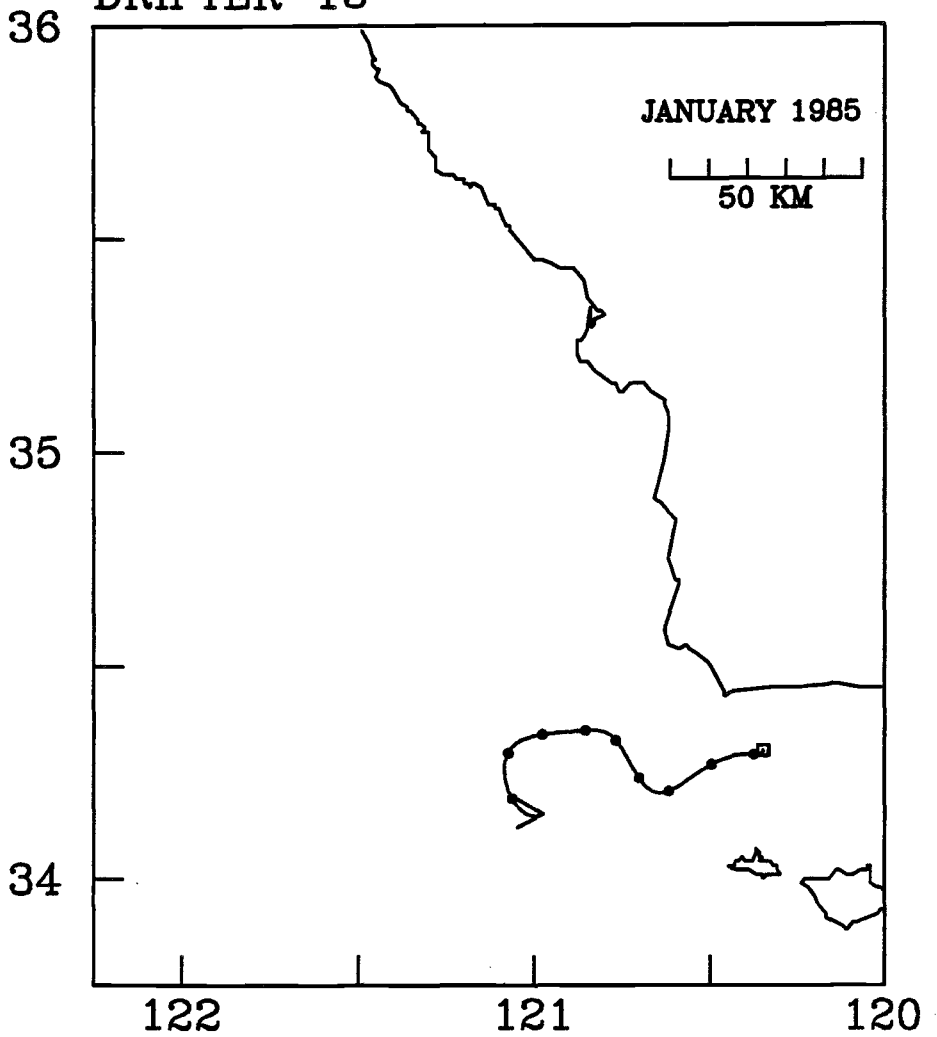
NDBC Buoy 46011



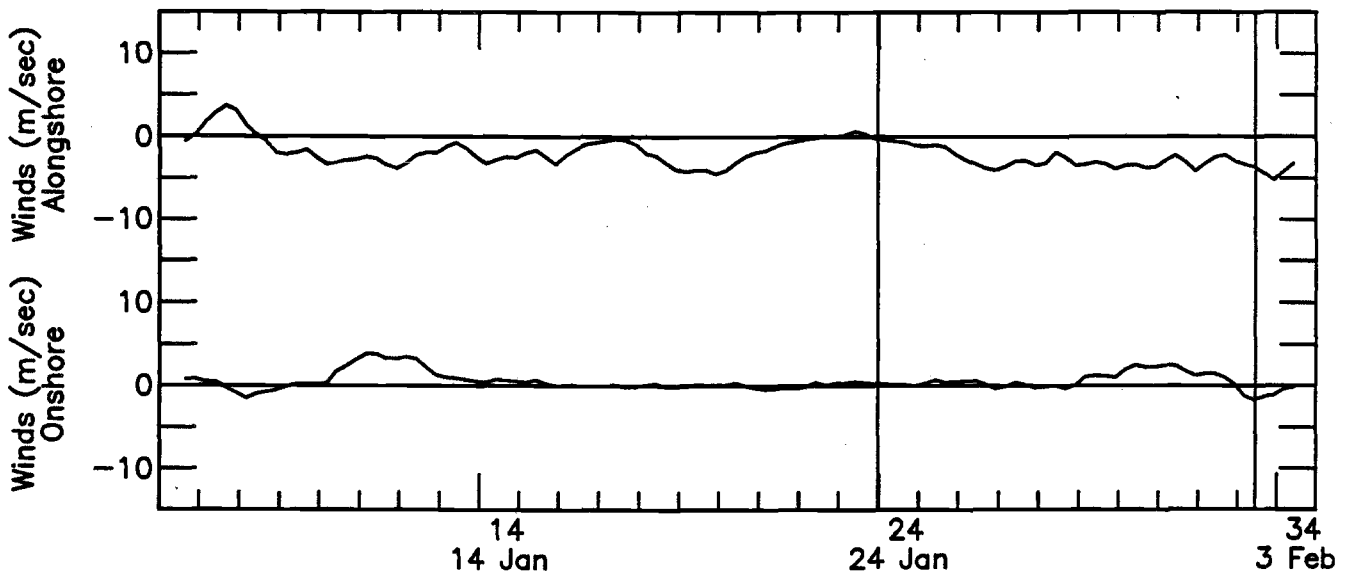
DRIFTER 13

TIME (days)	LAT (deg N)	LON (deg W)	SPEED (km/day)
23.98	34.30	120.35	
24.35	34.29	120.36	3.96
24.66	34.29	120.39	10.33
24.98	34.28	120.39	5.21
25.34	34.28	120.47	20.22
25.66	34.27	120.55	23.39
25.97	34.24	120.55	12.09
26.37	34.21	120.59	12.13
26.67	34.20	120.63	13.06
26.97	34.22	120.64	9.53
27.34	34.22	120.70	14.50
27.65	34.25	120.72	12.76
27.98	34.28	120.73	9.62
28.35	34.31	120.77	13.44
28.70	34.37	120.79	20.27
28.99	34.33	120.78	13.91
29.37	34.35	120.88	23.11
29.67	34.37	120.87	7.09
30.01	34.32	120.89	18.51
30.40	34.35	120.98	24.54
30.97	34.32	121.05	12.09
31.39	34.35	121.07	9.50
31.99	34.21	121.08	25.74
32.68	34.19	121.06	4.63
33.45	34.15	120.98	10.58

DRIFTER 13



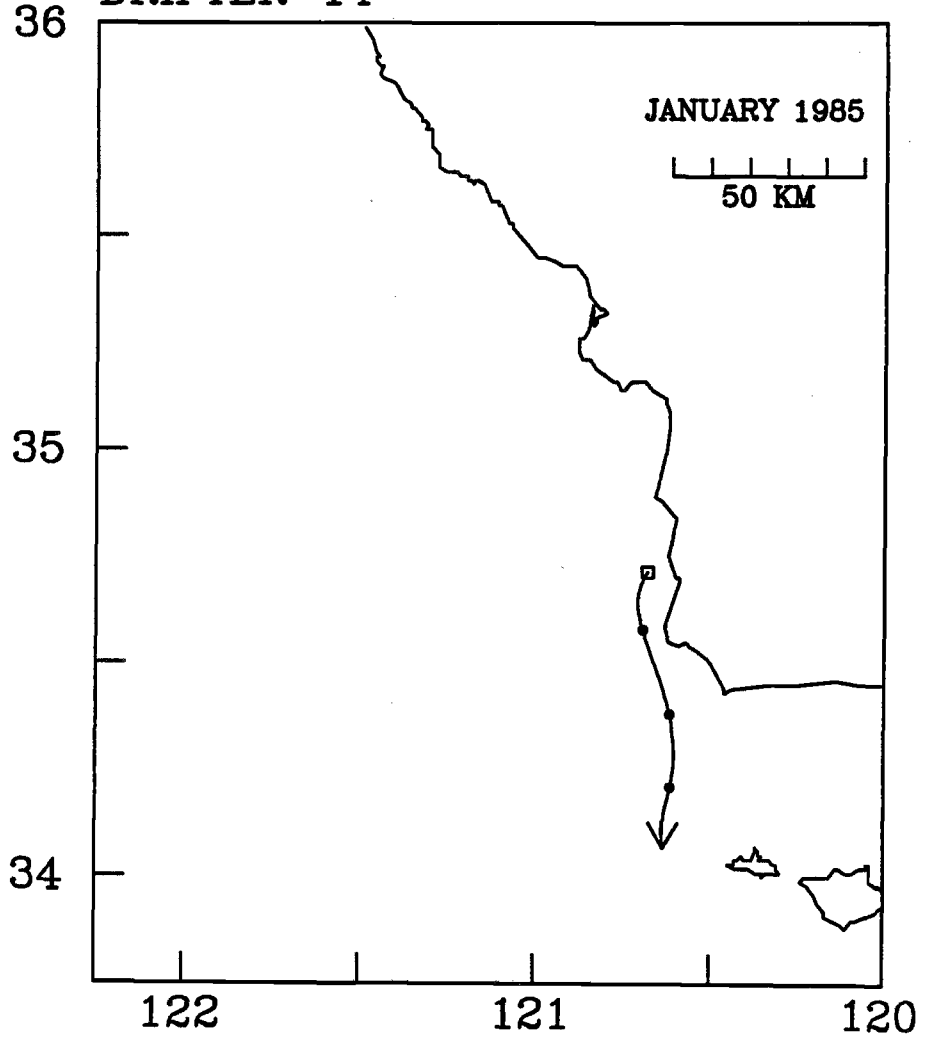
NDBC Buoy 46011



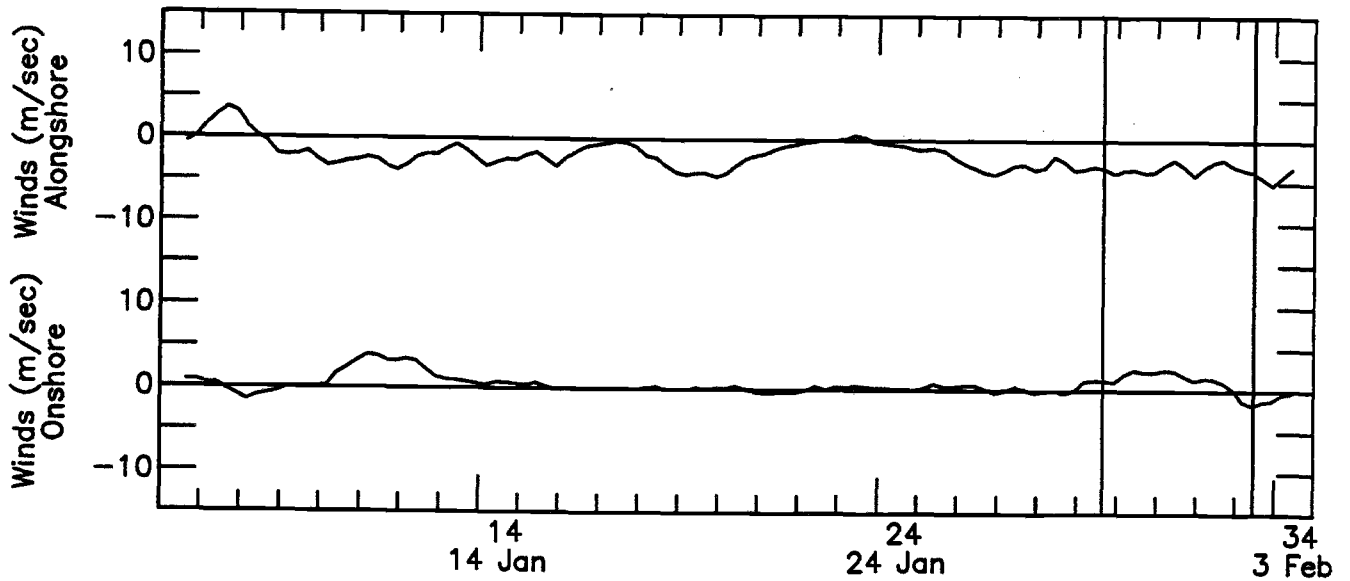
DRIFTER 14

TIME (days)	LAT (deg N)	LON (deg W)	SPEED (km/day)
29.65	34.72	120.89	
29.97	34.65	120.69	22.90
30.47	34.59	120.72	14.54
30.69	34.55	120.68	25.64
31.01	34.47	120.84	27.14
31.40	34.43	120.84	11.88
31.69	34.35	120.58	38.38
31.98	34.26	120.81	35.93
32.67	34.21	120.63	8.38
33.48	34.06	120.63	20.26

DRIFTER 14

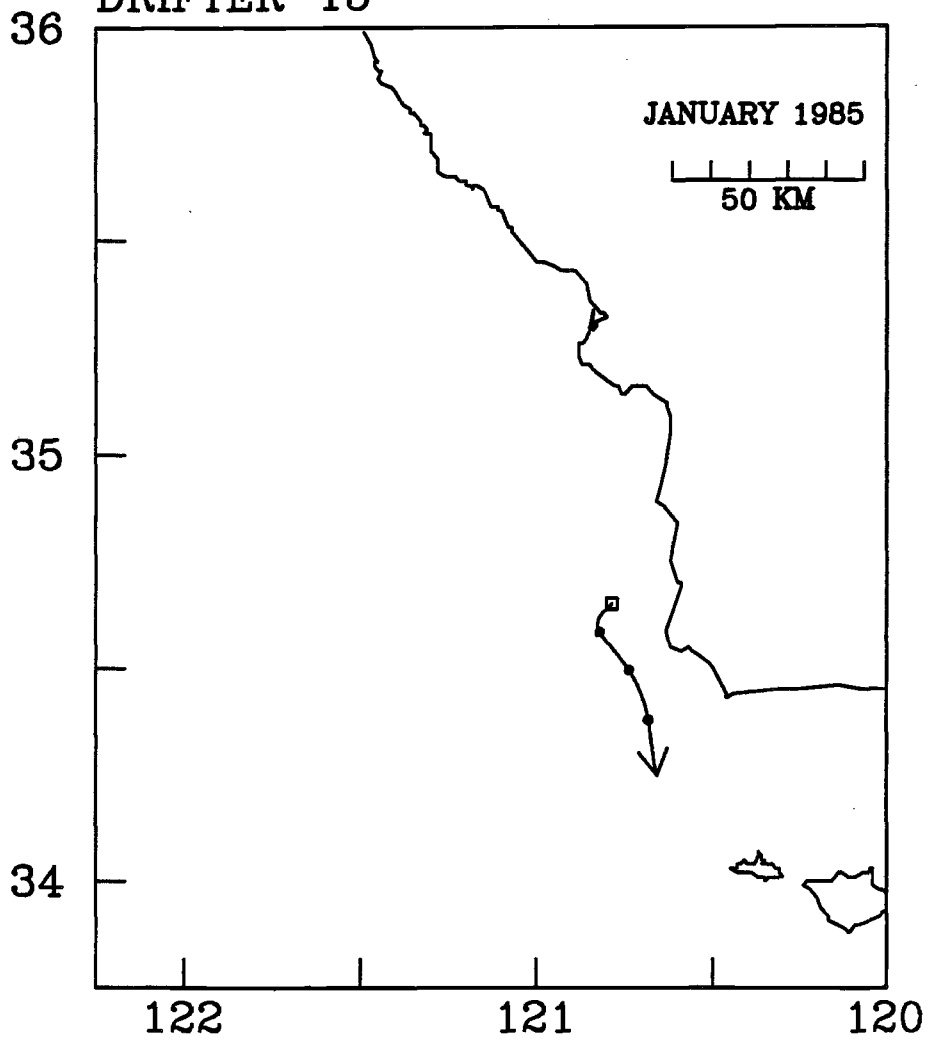


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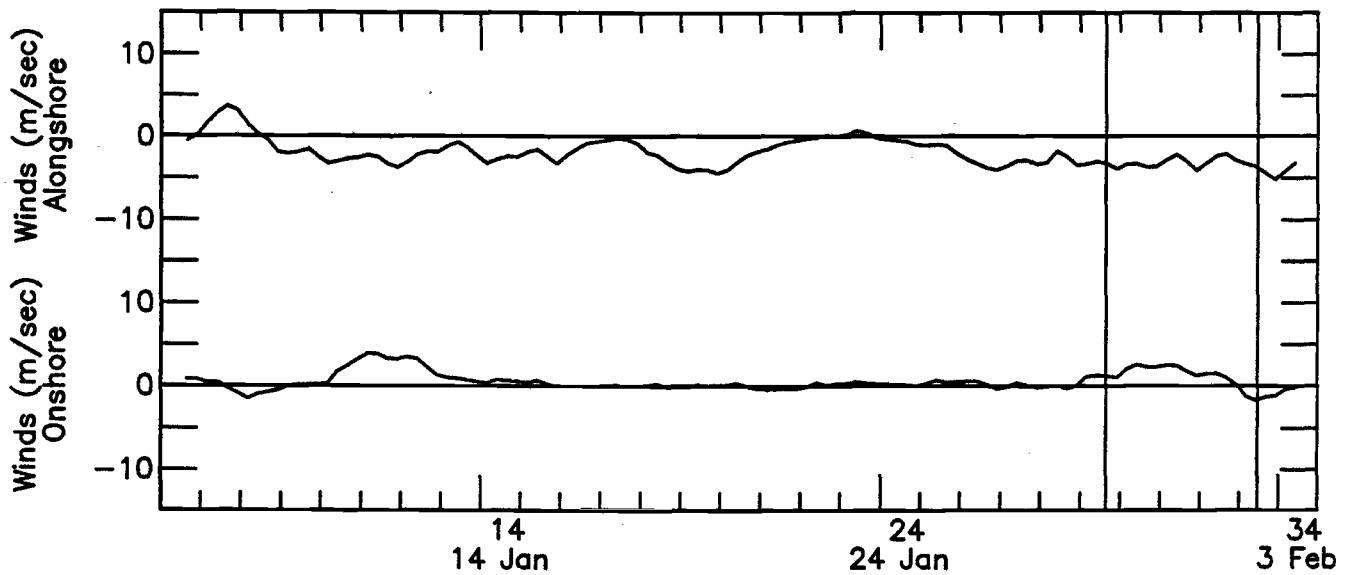


DRIFTER	15		
TIME (days)	LAT (deg N)	LON (deg W)	SPEED (km/day)
29.65	34.65	120.79	
29.97	34.62	120.82	12.91
30.48	34.59	120.83	6.43
30.69	34.56	120.80	19.17
31.01	34.53	120.79	11.69
31.42	34.54	120.77	5.00
31.69	34.49	120.71	29.48
31.98	34.40	120.69	36.65
32.69	34.37	120.69	3.41
33.47	34.24	120.65	19.49

DRIFTER 15



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DRIFTER 16

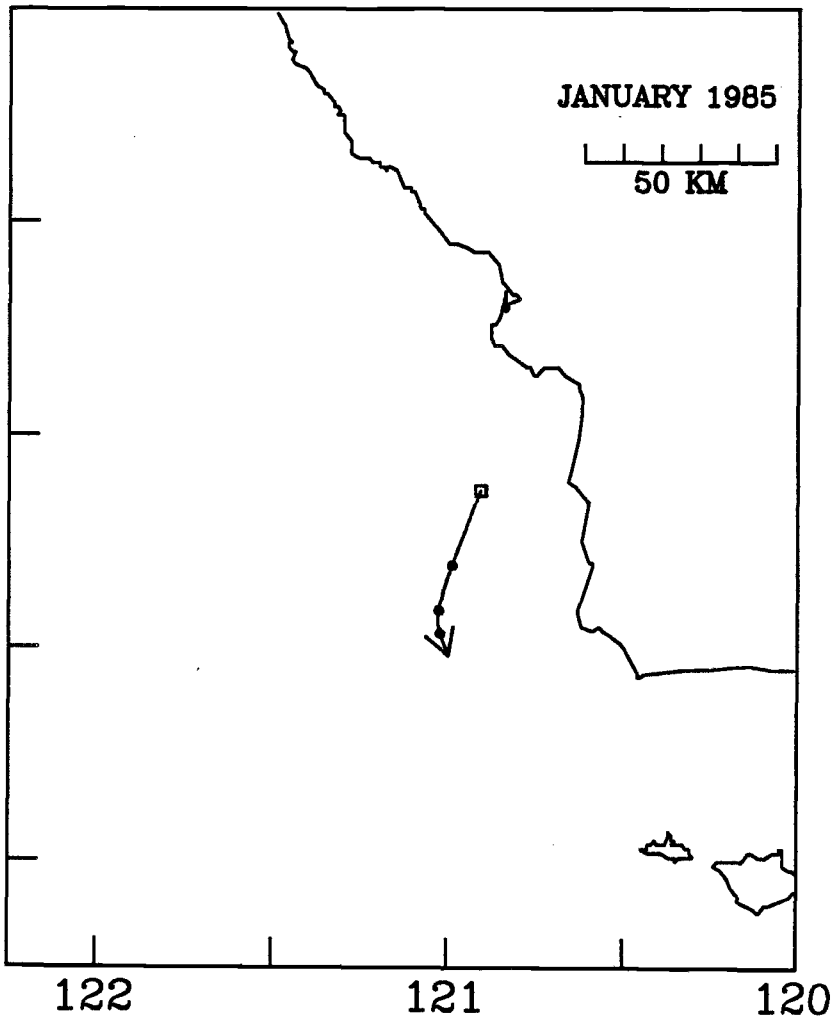
TIME (days)	LAT (deg N)	LON (deg W)	SPEED (km/day)
29.64	34.86	120.92	
29.70	34.85	120.92	23.82
29.96	34.78	120.93	30.78
30.09	34.76	120.96	21.81
30.34	34.73	120.99	19.82
30.37	34.72	120.99	18.17
30.42	34.72	120.99	16.25
30.46	34.71	120.99	23.88
30.50	34.70	120.99	24.98
30.54	34.69	120.99	21.81
30.58	34.68	121.00	27.43
30.62	34.67	121.00	17.56
30.67	34.67	121.00	17.53
30.71	34.66	120.99	15.55
30.75	34.65	120.99	18.50
30.97	34.62	121.01	18.37
31.03	34.62	121.02	17.73
31.09	34.62	121.03	13.94
31.38	34.63	121.05	8.59
31.44	34.63	121.04	14.09
31.62	34.59	121.01	31.74
31.72	34.55	121.00	37.16
31.97	34.49	121.02	27.31
32.01	34.58	121.02	303.66
32.38	34.54	121.06	14.91
32.66	34.54	121.00	19.02
33.44	34.47	121.00	8.70

DRIFTER 16

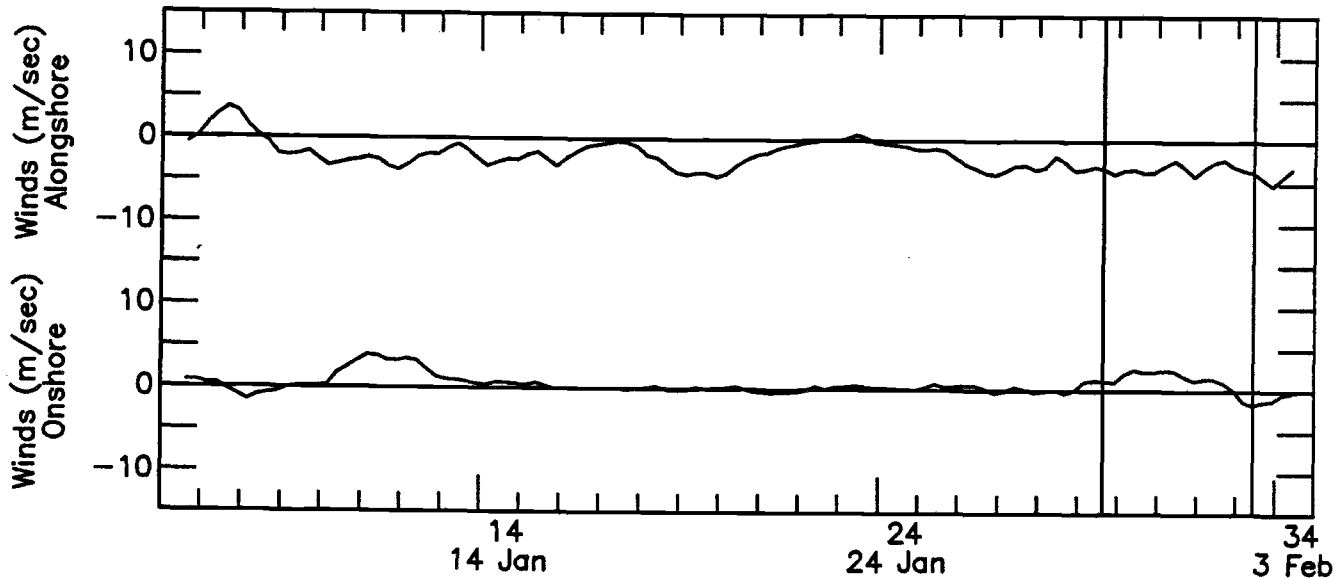
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DRIFTER 17

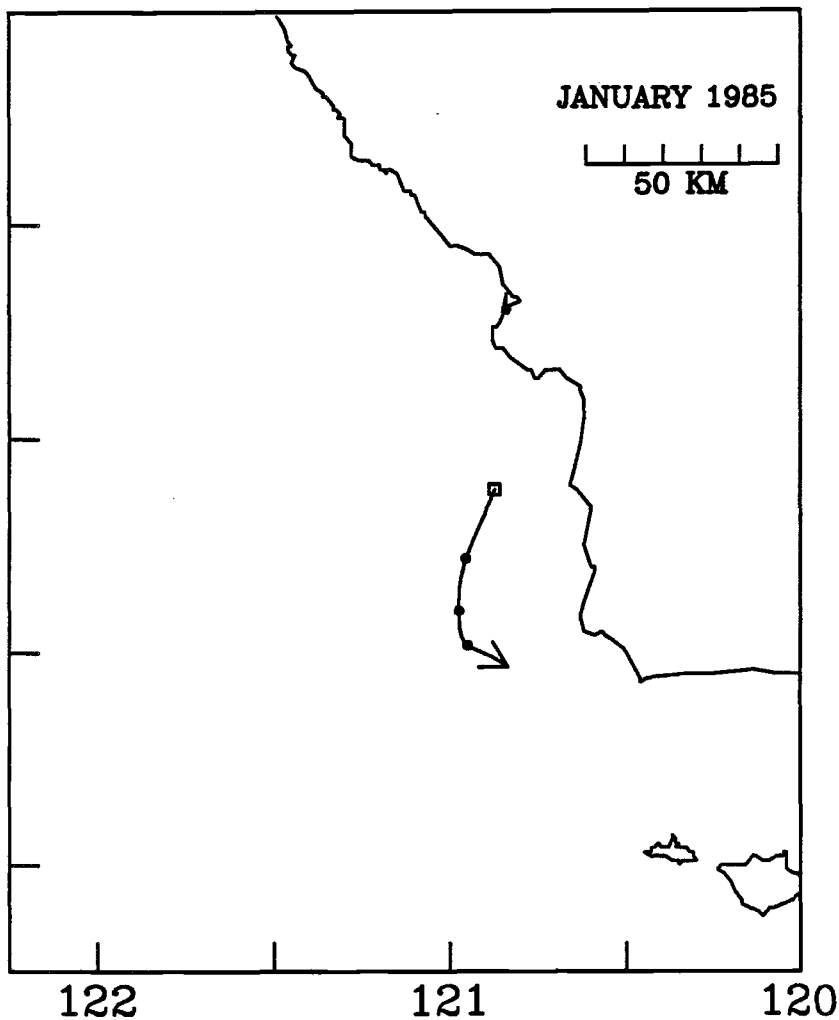
DRIFTER 17

TIME (days)	LAT (deg N)	LON (deg W)	SPEED (km/day)
29.64	34.88	120.89	
29.70	34.86	120.88	38.88
29.96	34.79	120.91	28.43
30.09	34.78	120.92	12.70
30.33	34.75	120.95	18.85
30.37	34.75	120.95	23.18
30.41	34.74	120.95	18.50
30.45	34.73	120.95	23.49
30.50	34.72	120.96	18.72
30.54	34.72	120.96	20.09
30.58	34.71	120.96	20.76
30.62	34.70	120.96	28.40
30.67	34.69	120.96	20.72
30.70	34.69	120.96	12.34
30.75	34.68	120.96	11.97
30.97	34.65	120.98	15.08
31.02	34.65	120.98	8.11
31.09	34.65	120.99	7.69
31.37	34.65	120.99	0.96
31.44	34.65	120.98	17.38
31.61	34.60	120.96	29.35
31.72	34.57	120.96	32.24
31.97	34.50	120.96	32.78
32.01	34.49	120.96	14.11
32.38	34.55	121.00	19.51
32.65	34.53	120.93	22.50
33.43	34.46	120.83	16.71

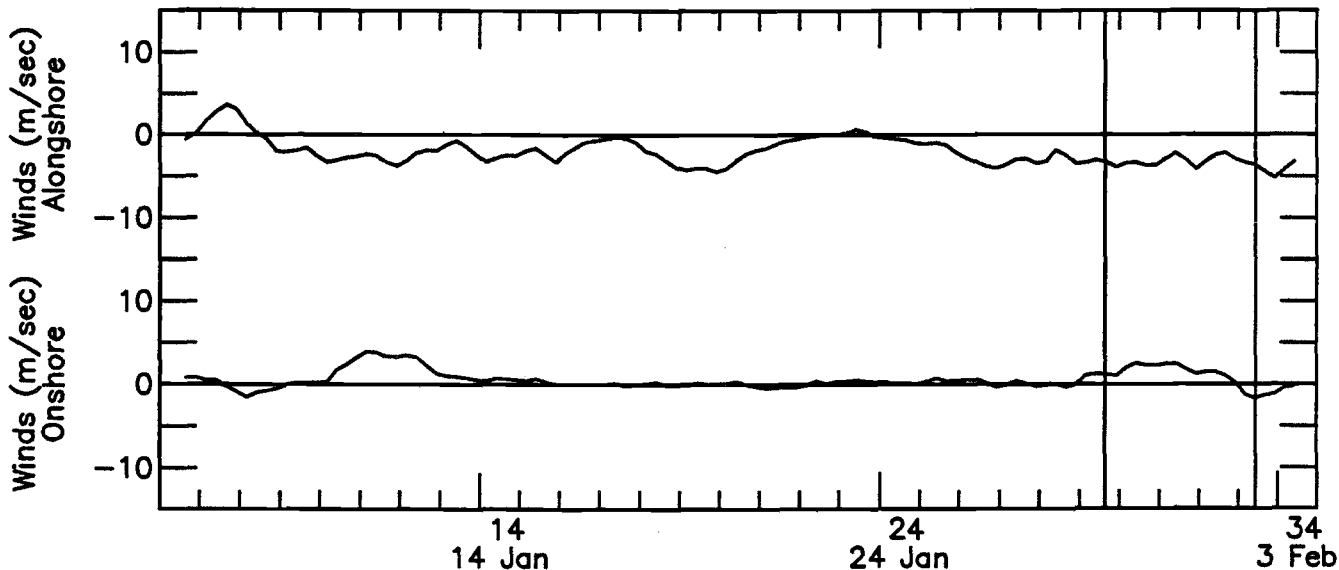
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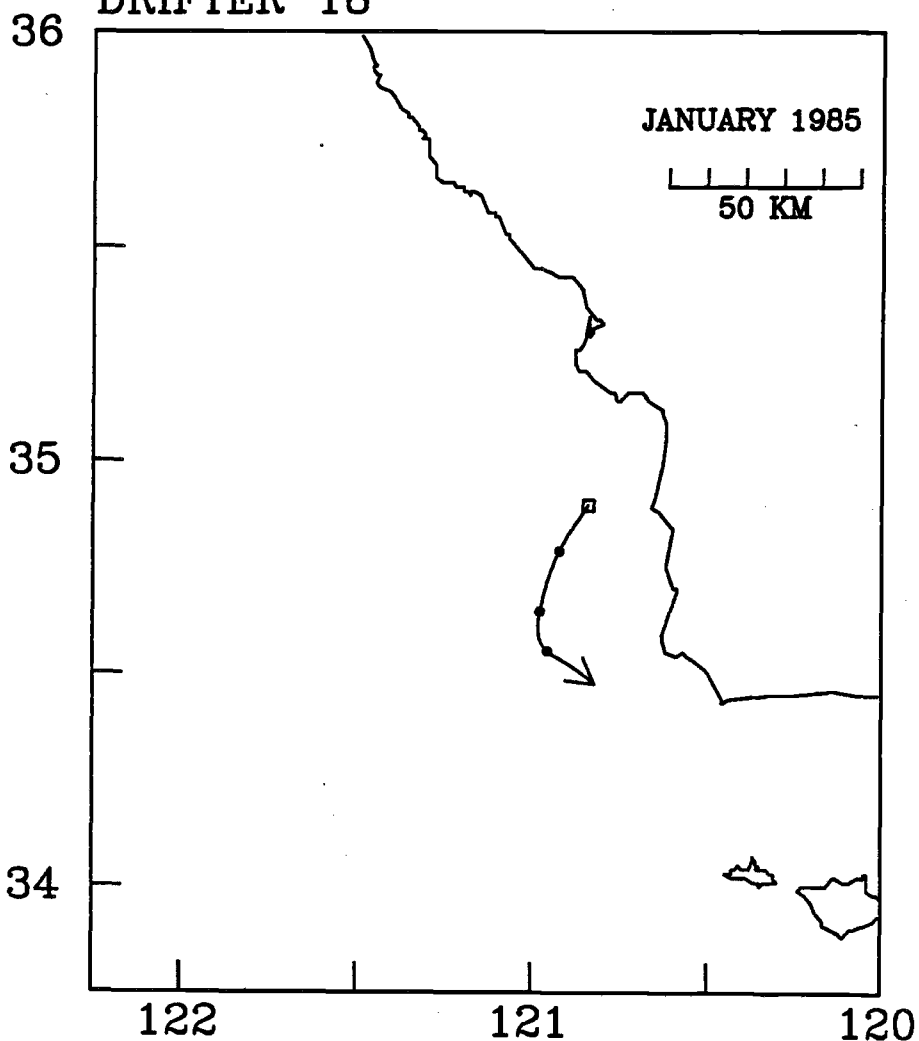
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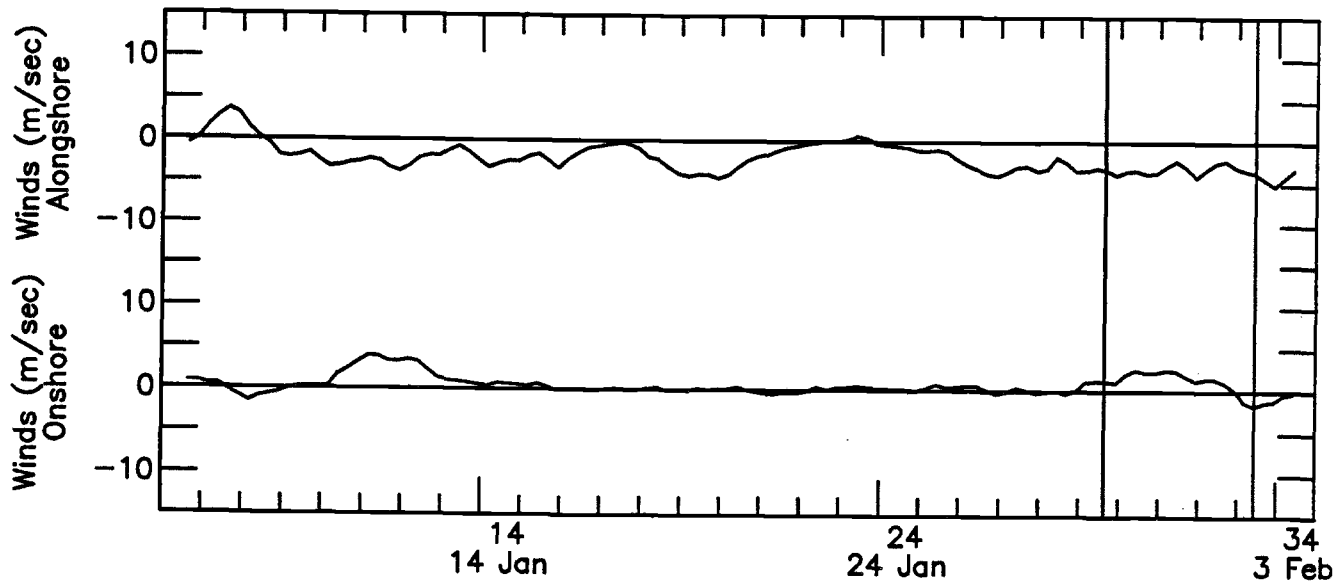
DRIFTER 18

TIME (days)	LAT (deg N)	LON (deg W)	SPEED (km/day)
29.84	34.90	120.85	
29.71	34.88	120.85	21.25
29.96	34.85	120.87	15.84
30.09	34.85	120.89	14.93
30.33	34.82	120.91	14.70
30.37	34.81	120.92	23.38
30.41	34.81	120.92	27.11
30.45	34.78	120.93	66.94
30.49	34.79	120.93	24.73
30.53	34.78	120.93	21.58
30.58	34.78	120.93	18.08
30.62	34.77	120.93	14.80
30.66	34.77	120.93	17.91
30.70	34.76	120.93	20.06
30.75	34.75	120.92	25.40
30.96	34.71	120.95	21.66
31.02	34.71	120.96	21.53
31.09	34.71	120.97	11.19
31.37	34.70	120.99	6.37
31.44	34.69	120.99	12.94
31.61	34.65	120.97	29.87
31.71	34.62	120.96	32.81
31.97	34.54	120.96	33.08
32.01	34.54	120.97	17.22
32.38	34.59	121.00	15.56
32.65	34.56	120.94	22.27
33.43	34.48	120.82	20.33

DRIFTER 18



NDBC Buoy 46011



DRIFTER 19

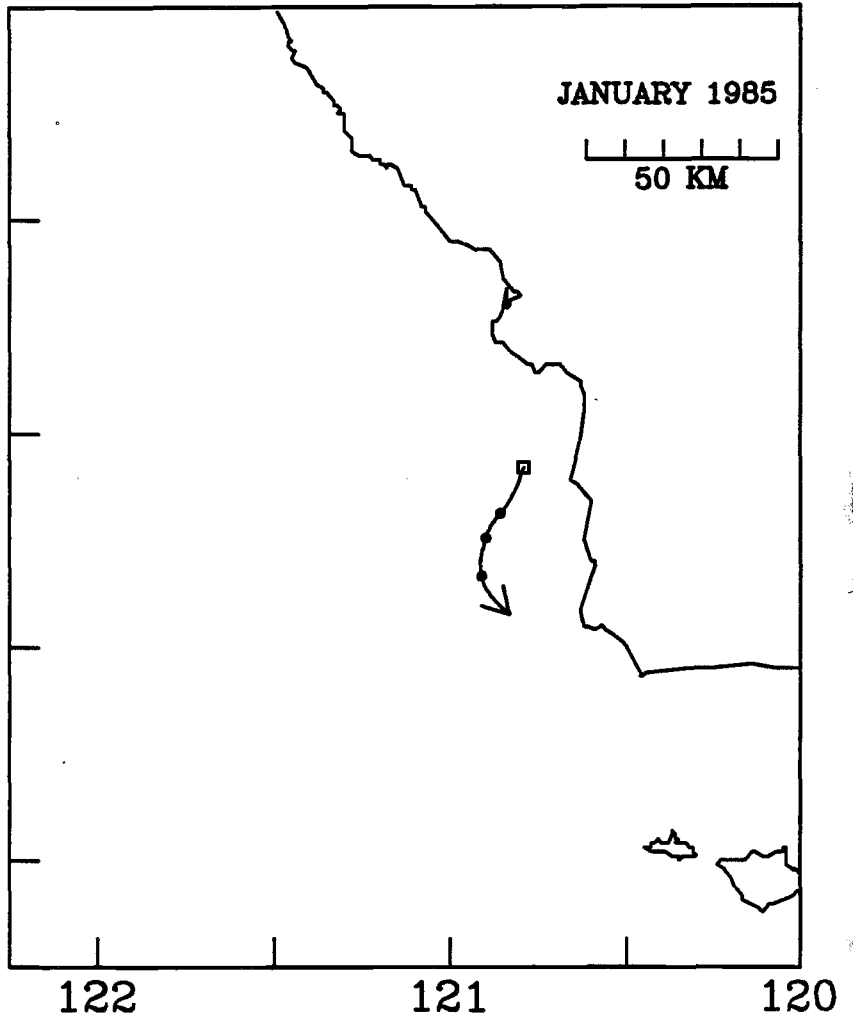
TIME (days)	LAT (deg N)	LON (deg W)	SPEED (km/day)
29.64	34.92	120.81	
29.71	34.90	120.81	23.70
29.96	34.85	120.79	23.32
30.09	34.84	120.82	25.21
30.32	34.83	120.85	8.95
30.37	34.83	120.85	16.32
30.41	34.82	120.85	10.01
30.45	34.82	120.86	14.99
30.49	34.81	120.86	20.51
30.53	34.81	120.87	19.66
30.58	34.81	120.87	9.93
30.61	34.81	120.87	2.84
30.86	34.81	120.87	6.52
30.70	34.80	120.87	7.37
30.74	34.80	120.87	3.26
30.78	34.80	120.87	12.36
30.96	34.78	120.88	11.93
31.02	34.78	120.89	12.07
31.08	34.78	120.89	5.44
31.37	34.78	120.90	4.03
31.44	34.78	120.91	12.62
31.61	34.76	120.90	13.29
31.71	34.75	120.89	14.66
31.97	34.68	120.88	30.17
32.01	34.67	120.89	26.63
32.37	34.70	120.94	13.38
32.64	34.67	120.93	13.82
33.42	34.57	120.82	18.39

DRIFTER 19

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