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Tabulation of N₂, O₂, CO₂, and He concentrations in soil gases
collected daily for 11 months from 0.3-, 0.6-, 1.2-, and 2.0-m depths

By

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Tabulation of N₂, O₂, CO₂, and He Concentrations in Soil Gases Collected Daily for 11 Months from 0.3-, 0.6-, 1.2-, and 2.0-m Depths

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ABSTRACT

Concentrations of N₂, O₂, CO₂, and He were measured in soil gases collected daily for 11 months from 0.3-, 0.6-, 1.2-, and 2.0-m depths at a site near Denver, Colorado. Soil and air temperatures, percent relative humidity, barometric pressure, rainfall, snowfall, and wind direction and speed were also monitored. Sampling and analysis of the soil gases are described and measurements of gas concentrations and meteorological parameters are listed.

Results showed that CO₂ concentrations at all depths were more affected by environmental variables than were concentrations of any other gas. CO₂ concentrations increased as soil and air temperatures increased. CO₂ concentrations also increased slightly as barometric pressure increased, but decreased with increased relative humidity.

Helium concentrations at the 0.3-m depth decreased as air temperatures increased. Concentrations at deeper depths were unaffected by temperature.

Nitrogen concentrations were unaffected by any meteorology variable. Plots of O₂ concentrations were the opposite of CO₂ plots, that is, O₂ concentrations were low when CO₂ concentrations were high.

INTRODUCTION

Measurement of concentrations of N₂, O₂, CO₂, and He in soil gases and meteorological parameters have been monitored on a long-term basis at several sites in both dry and humid environments (Klusman and Jaacks, 1987; Hinkle, 1988; Hinkle and Ryder, 1988; Hinkle and Dennen, 1989). The purpose of these studies has been to better understand the effects of environmental conditions on concentrations of soil gas components that are often used for geochemical exploration for mineral and geothermal resources.

Results of these long-term monitoring studies indicate that soil moisture and soil and air temperatures have the greatest impact on soil-gas concentrations. High soil moisture tends to either flush gases from the soil pores or to dissolve the gases; the effect in both cases is decreased concentration of gases in the soil. Increased concentrations of soil-gas CO₂ generally occur with increased soil temperatures in summer, whereas He concentrations generally decline as soil temperatures increase (Hinkle and Ryder, 1987, 1988; Reimer, 1979, 1980).

Most soil gas studies involve gases sampled at depths of about 0.6-0.75 m, the most common depths used for geochemical exploration. However, gases sampled at shallower depths may be more susceptible to meteorological changes than gases sampled at depths of 1.0-2.0 m. For example, in a 10-day study, Reimer (1980) observed that meteorological parameters had no apparent effect on He at 1.0- to 2.0-m depths, but appeared to cause "noise" in the concentration data at depths less than 1.0 m.

The purpose of this study was to compare variations in the concentrations of N₂, O₂, CO₂, and He collected at four depths with variations in meteorological parameters. The depths chosen for sampling ranged from 0.3 m (a depth sometimes mandated for geochemical exploration by rocky soil conditions), to the commonly used 0.6 m to 1.2 m and 2.0 m. Hollow probes were placed in the ground at a site near Denver, Colorado. Rocky soil conditions at the site necessitated emplacement of the 1.2- and 2.0-m probes adjacent to a

brick building where the soil was composed primarily of packed sand containing about 3 percent organic matter. Therefore, all of the probes were emplaced in a line about 0.5 m apart and about 0.75 m from the wall on the west side of the building.

SAMPLE COLLECTION AND ANALYSIS

The hollow probes used in the study were described by Reimer and Bowles (1979) and have been widely used for collecting soil-gas samples. The probes were driven into the ground by means of a sliding hammer attached to the shaft of the probe. After the probe was driven into the ground, it was fitted with an airtight cap and septum for withdrawal of the soil-gas sample. A PVC pipe was placed over the probe and cap, and the pipe was covered with an inverted plastic beaker to protect the probe from the weather.

Before removal of the first sample, 10 mL of air were withdrawn from the probe to remove air introduced when the probe was emplaced in the ground; 10 mL of air were also removed from the probe whenever the rubber septum was changed. All soil-gas samples, except those collected on the first day, had equilibrated for a minimum of 24 h before collection. Samples were collected from the hollow probe by inserting the needle of a syringe through the septum in the cap and withdrawing 10 mL of the soil gas. The soil-gas samples were transferred to 5-mL evacuated blood-sampling vials for storage, by inserting the needle of the syringe containing the gas sample through the rubber cap of the evacuated vial and allowing the sample in the syringe to be drawn inside. The needle hole was covered with silicone glue. Soil-gas samples can be stored in these evacuated vials for as long as 2 months without leakage (Hinkle and Kilburn, 1979).

Samples were collected and meteorological measurements were made daily, except for holidays. On a few days, collections and measurements were made every 1-2 h in order to compare soil-gas concentrations with diurnal changes. A total of 339 samples were collected from each depth during the period from May 30, 1989 through April 22, 1990.

Barometric pressure was measured by a barometer located inside the building. Air temperature was measured using a dial-type metal thermometer attached to the PVC pipe. Soil temperatures were measured using two dial-type metal thermometers emplaced in the ground with the tips of the thermometer stems at 5- and 20-cm depths. Relative humidity was measured by a gauge placed in a window of the building between the glass and an outside screen. Rainfall was measured by a commercial rain gauge. Snowfall was measured by a ruler.

Wind direction and speed were obtained by monitoring weather information broadcast to pilots at 126.25 MHz by the control tower at the Jefferson County airport, 5 km north of the sample site. Weather measurements are taken at the airport and a new recording is made hourly at about 10 min before the hour. Therefore, most of the sampling was done at about this time in order to use current wind data.

Gas in the vials was removed by injecting 5 mL of air (equal to the volume of the vial) into the vial and removing the mixture of air and soil gas. The samples were analyzed for He using mass spectrometry (Reimer and Denton, 1978). Standard samples of air containing known concentrations of He were analyzed several times per day to ensure stability of the instrument. Concentrations of He were reported as variations from the concentration of He in air (5,240 ppb) (Glueckhauf, 1946; Oliver and others, 1984). The reproducibility of measurement was ± 10 ppb. The tubes used for sample storage were approximately 80 percent evacuated. They contained a residual concentration of He, introduced during the manufacturing process, that was the same for all the tubes in each lot produced by the manufacturer. This residual He concentration was measured and subtracted from the raw measurement of He in the soil gas.

Samples were analyzed for N₂, O₂, and CO₂ using gas chromatography; operating conditions for the gas chromatograph are shown in table 1. Concentrations of N₂, O₂, and CO₂ were measured compared to standard curves and are reported as volume percents. Standard samples containing known concentrations of the gases were analyzed several times per day to ensure stability of the instrument.

DESCRIPTION OF THE DATA TABLES

Data from the analyses were entered into an IBM personal computer and stored on disks, using STATPAC programs developed for personal computers by Grundy and Miesch (1987). Table 2 includes data for all meteorological measurements: date of sample collection, soil temperature at 20-cm and 5-cm depths (°C), air temperature (°C), relative humidity (%), rainfall (cm), snowfall (cm), barometric pressure (cm), wind direction (degrees--north = 0, east = 90, south = 180, west = 270,) and wind speed (km/h). Volume/volume concentrations of N₂ (%), O₂ (%), CO₂ (%), and He (ppb) in soil gases are listed in table 3 for 2.0- and 1.2-m depths, and in table 4 for 0.6- and 0.3-m depths. The letter "B" indicates that no analysis was performed for that particular parameter.

Minimum, maximum, and mean values for all the variables are listed in table 5. Correlation coefficients are listed in tables 6 and 7. All values were calculated using only the unqualified data, that is, no "B" values were used in the computations. Numbers of unqualified values at each site were: 310 at 2.0-m depth, 315 at 1.2-m depth, 314 at 0.6-m depth, and 314 at 0.3-m depth.

Daily measurements of soil temperature and meteorology data are plotted in figures 1a-1h. However, wind direction data were not plotted because wind direction varied frequently throughout the year without any pattern. Concentrations of the gases measured at the four depths are plotted in figures 2a-5d.

DISCUSSION OF THE RESULTS

Soil and air temperatures varied seasonally (figs. 1a, 1b, 1d). The ground occasionally froze in winter at the 5-cm depth, but not at the 20-cm depth.

Relative humidity and wind speeds were generally higher in winter than in summer (figs. 1c, 1f). Barometric pressure varied more in winter than in summer (fig. 1e).

Mean concentrations of both N₂ and He were essentially the same at all four depths. Concentrations of O₂ at 2.0 m and 1.2 m were slightly lower than at 0.6 m or 0.3 m. Carbon dioxide concentrations at 2.0 m and 1.2 m were slightly higher than closer to the surface (table 5). As expected, gas concentrations at each depth correlated better with gases at depths immediately above or below than at more distant depths (table 6). For example, gas concentrations at 0.6 m correlated better with concentrations at 0.3 m and 1.2 m than with concentrations at 2.0 m.

Nitrogen concentrations appeared to be unaffected by any meteorology variable. Plots of O₂ concentrations were the opposite of CO₂ plots, that is, O₂ concentrations were below average when CO₂ concentrations were above average. The inverse relationship between O₂ and CO₂ probably indicates consumption of O₂ and release of CO₂ during oxidation of organic matter in the soil.

Soil and Air Temperatures

Carbon dioxide was strongly affected by soil and air temperatures (table 7). Concentrations of CO₂ increased and decreased as temperatures rose and fell. Increasing relative humidity generally led to decreased CO₂ at all depths. Increased wind speed also caused decreased CO₂ concentrations, but only at the 0.3-m depth.

A comparison of CO₂ concentrations at the different depths with soil and air temperatures showed that CO₂ concentrations increased in order from the shallowest to the deepest as soil and air temperatures rose (figs. 1-5). The increase in CO₂ concentrations at 0.3-m depth preceded the CO₂ increase at the 0.6-m depth by a few days; the 0.6-m increase preceded the 1.2-m increase, and the 1.2-m increase preceded the 2.0-m increase. This sequential concentration change with soil and air temperatures occurred only for CO₂ and not for the other gases measured.

Helium concentrations at the 0.3-m depth were slightly affected by air temperatures. Higher air temperatures led to decreased He concentrations, probably due to the process of atmospheric pumping described by Reimer and Roberts (1985). In this process, air temperatures dry and heat the upper portions of the soil, thereby creating a local pumping effect with increased dispersal of He into the air and decreased He in the soil gas. Soil type and porosity influence the magnitude of the pumping effect.

Barometric Pressure

Increased barometric pressure tended to increase CO₂ concentrations at all depths, but especially at 1.2 m and 2.0 m. Helium concentrations were not affected by barometric pressure at any depth.

Relative Humidity

Increased relative humidity tended to decrease CO₂ concentrations slightly at all depths. Relative humidity changes had no apparent effect on the other gases measured.

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Fig. 1a. Soil temperatures ($^{\circ}\text{C}$)--20 cm depth

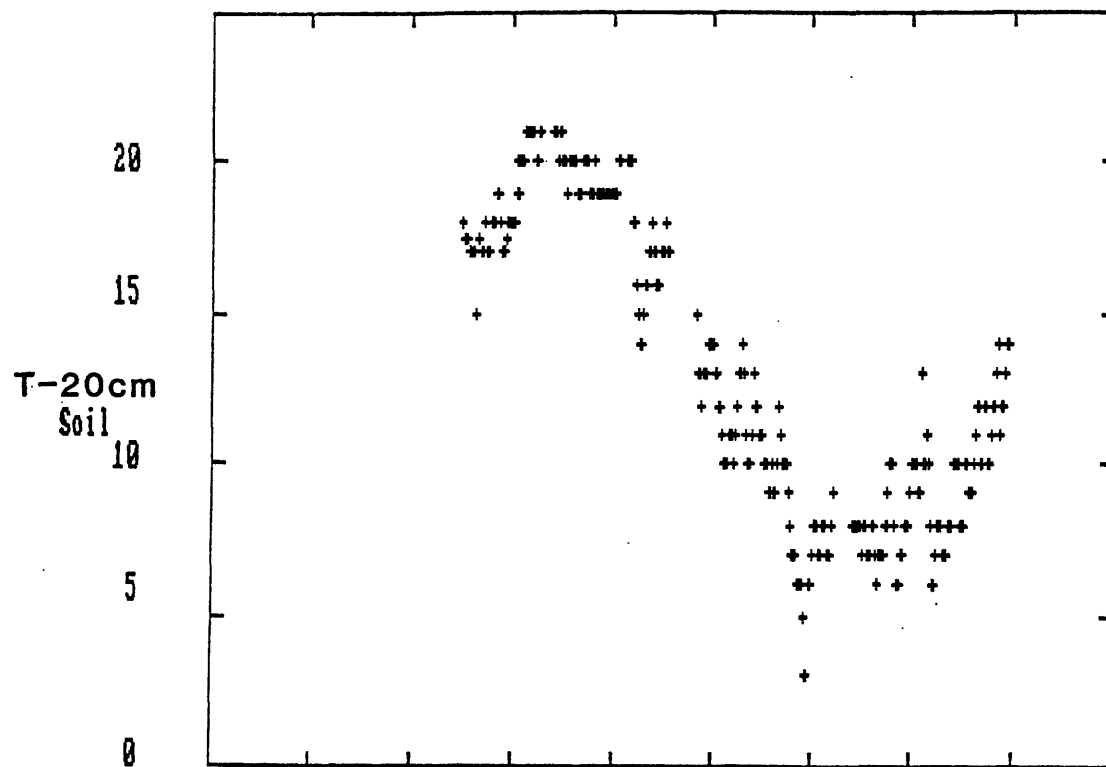
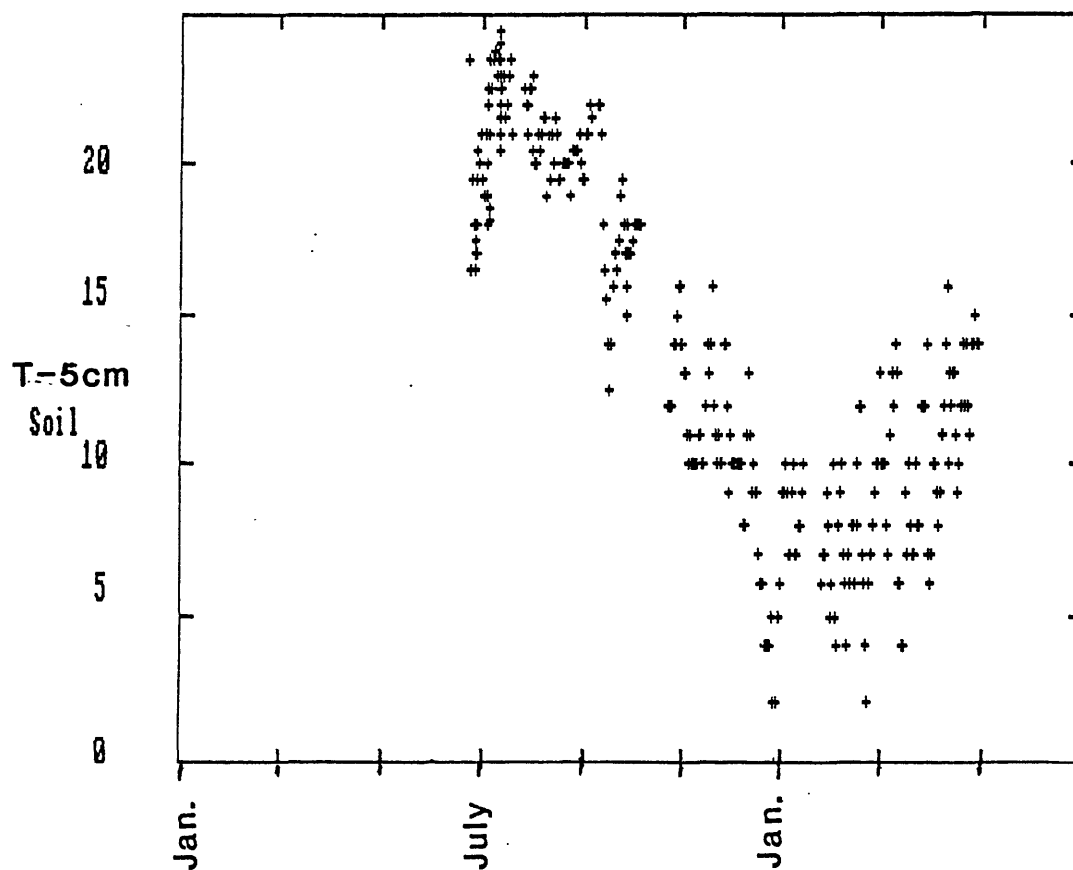


Fig. 1b. Soil temperatures ($^{\circ}\text{C}$)--5 cm depth



Date (1989-1990)

Fig. 1c. Relative humidity (%)

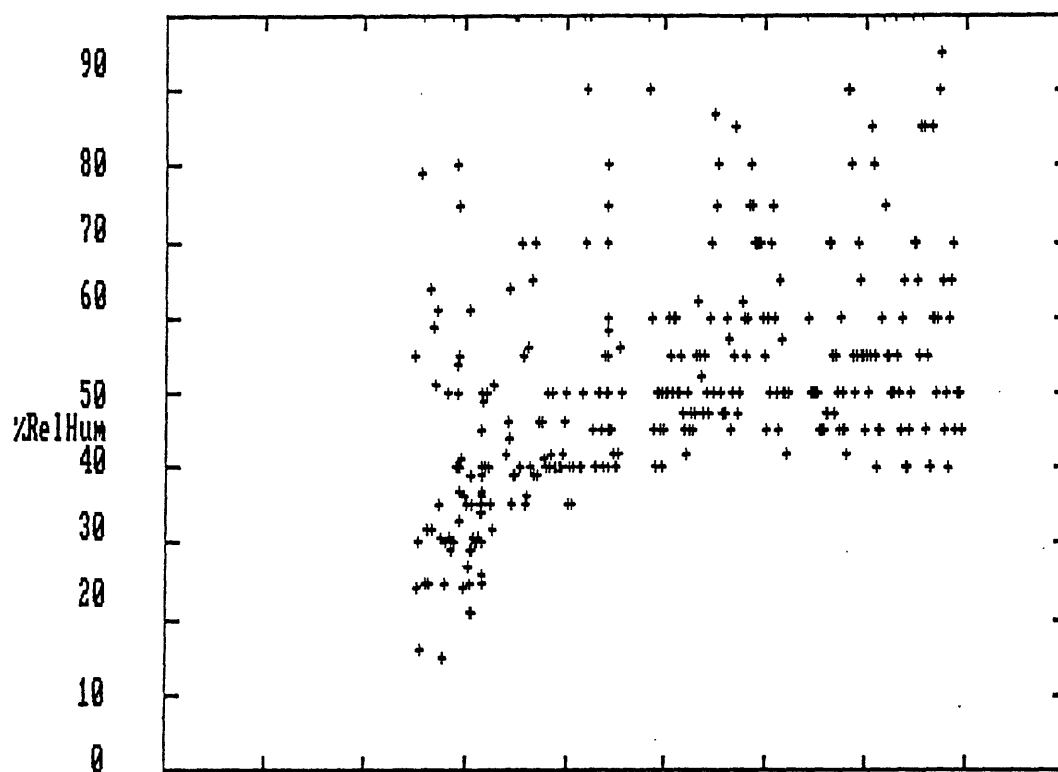
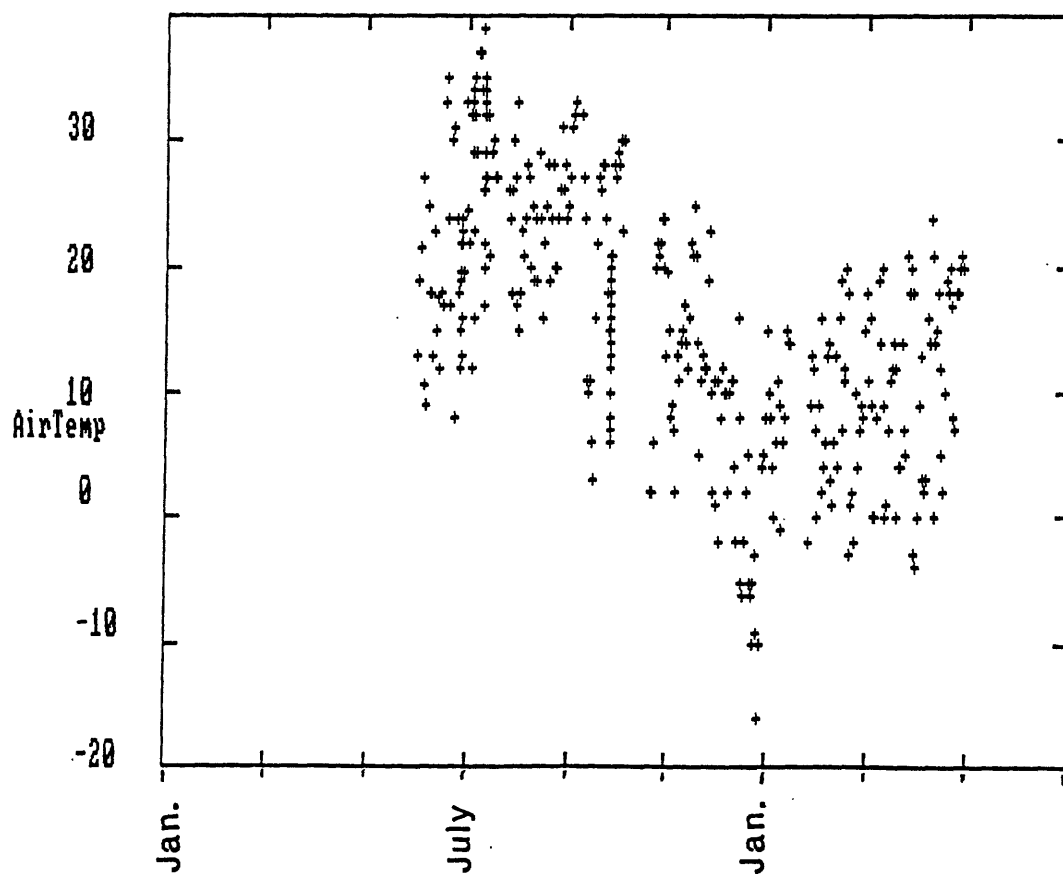


Fig. 1d. Air temperatures ($^{\circ}\text{C}$)



Date (1989-1990)

Fig. 1e. Barometric Pressure (cm)

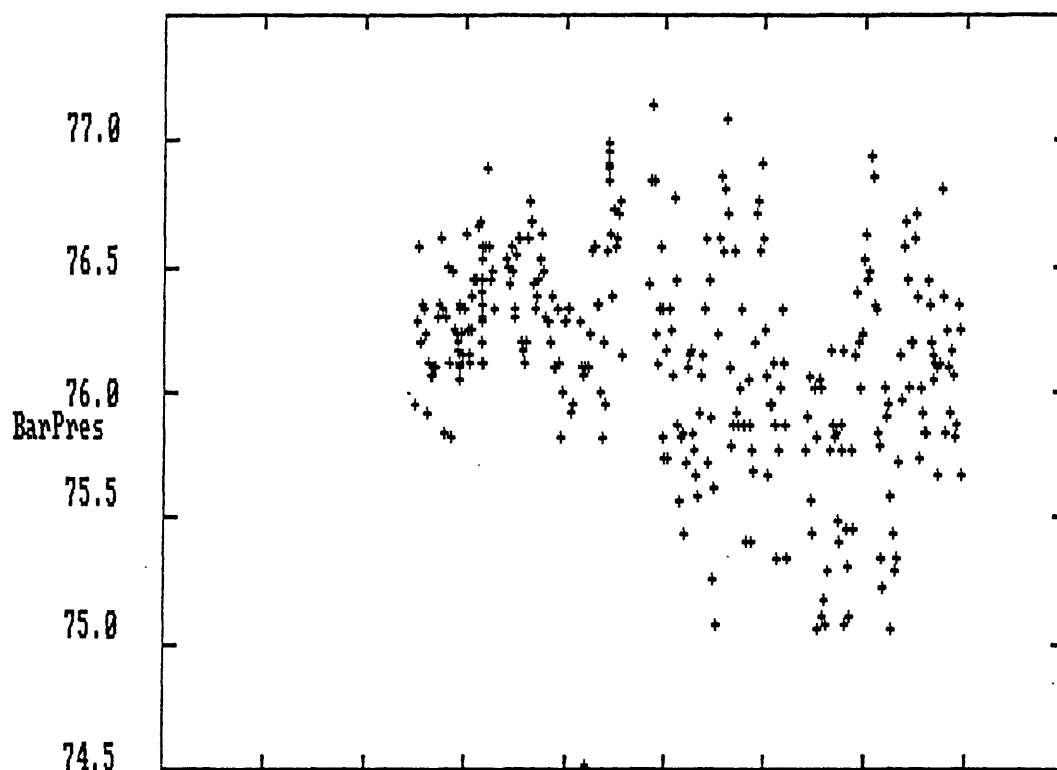


Fig. 1f. Wind Speed (km/hr)

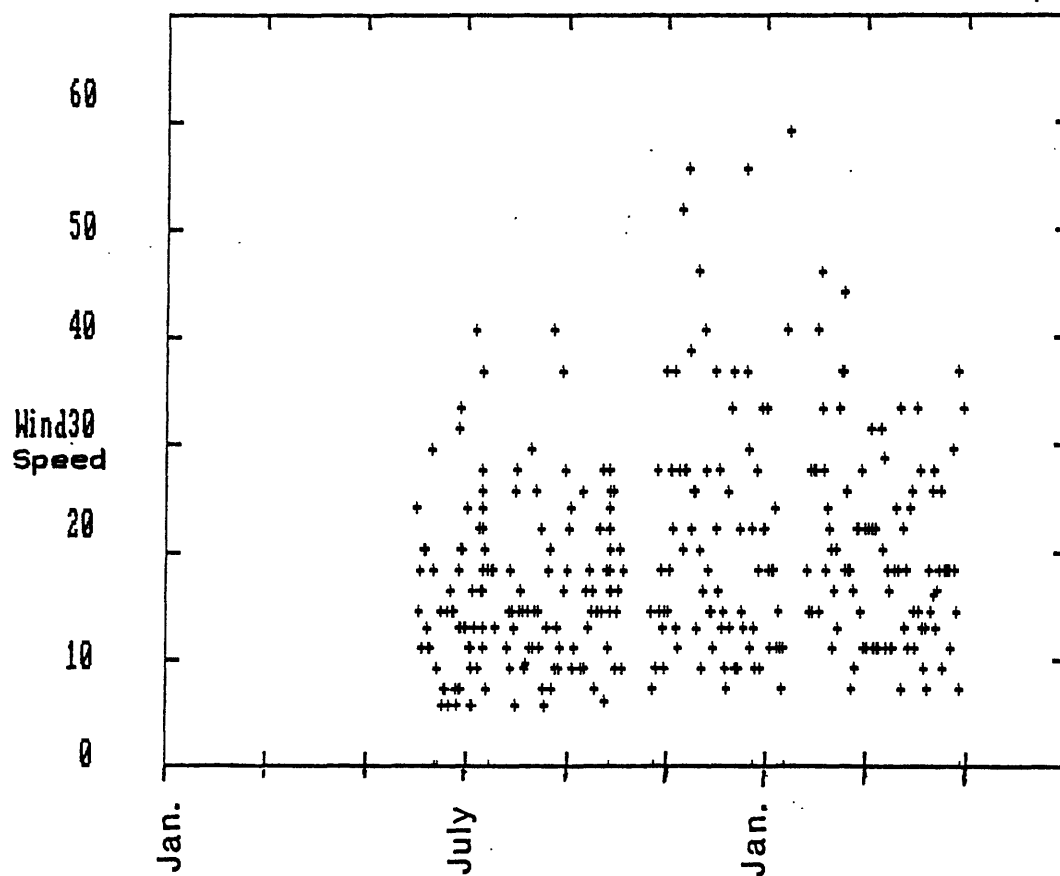


Fig. 1g. Rain (cm)

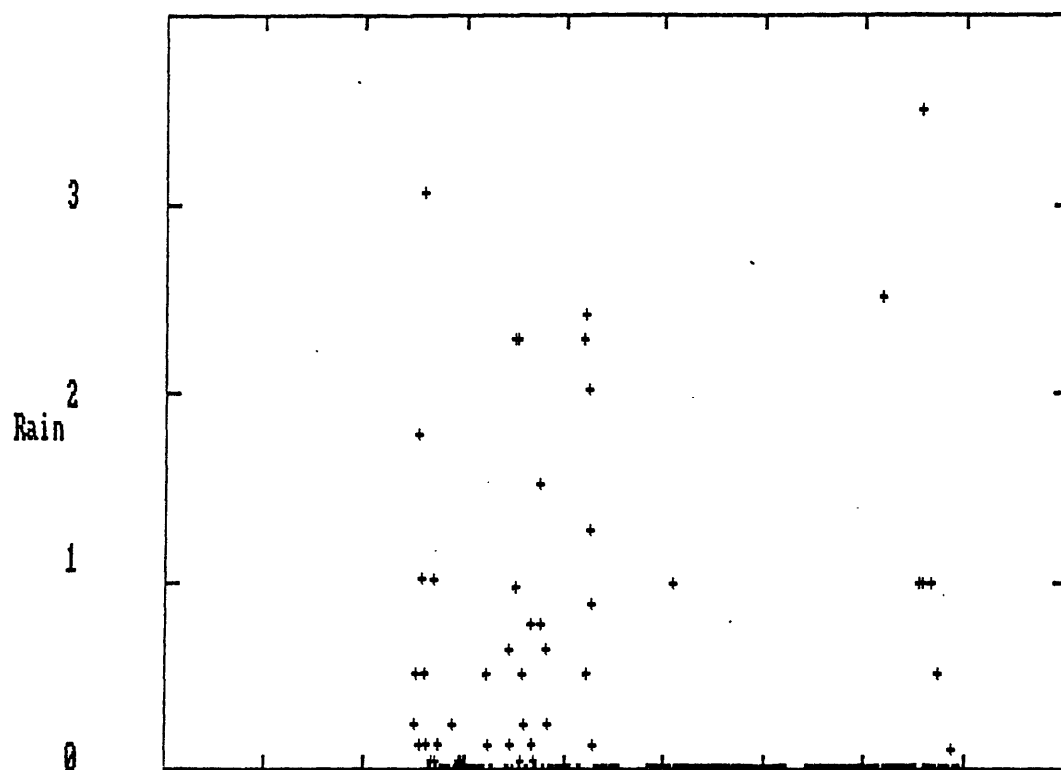
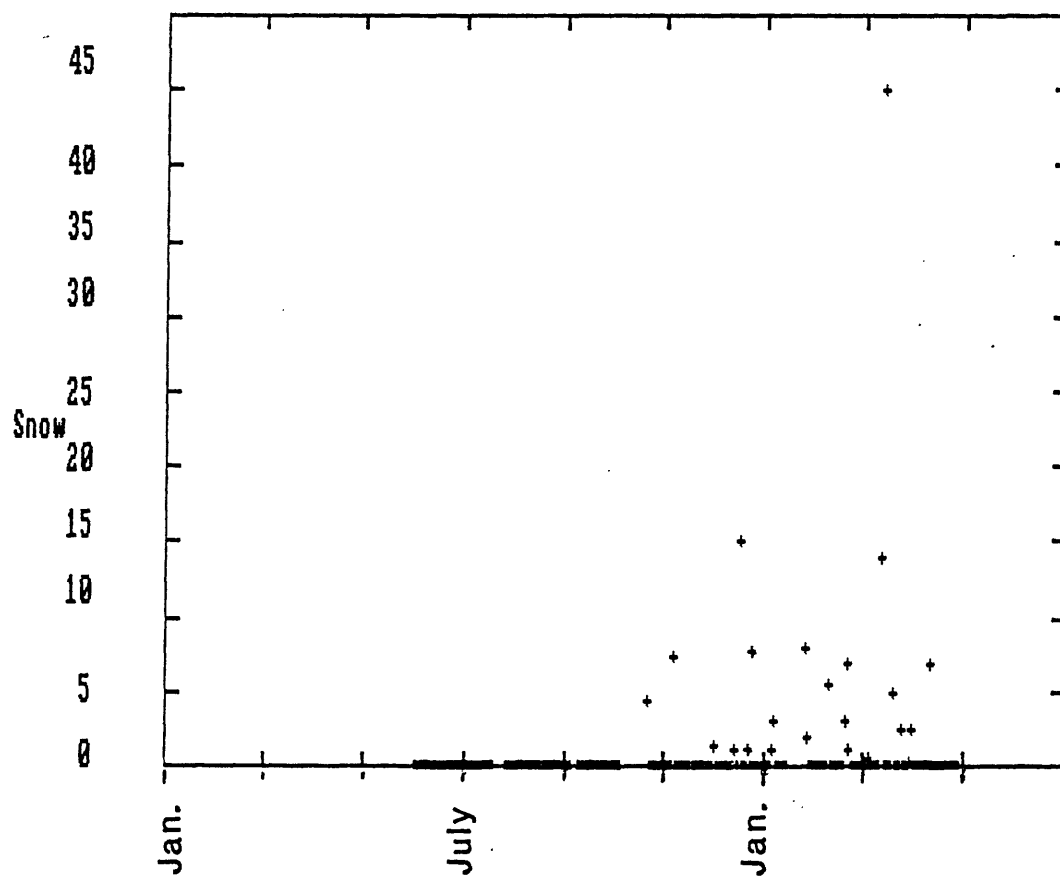


Fig. 1h. Snow (cm)



Date (1989-1990)

Fig. 2a. N2 (%)--2.0 m depth

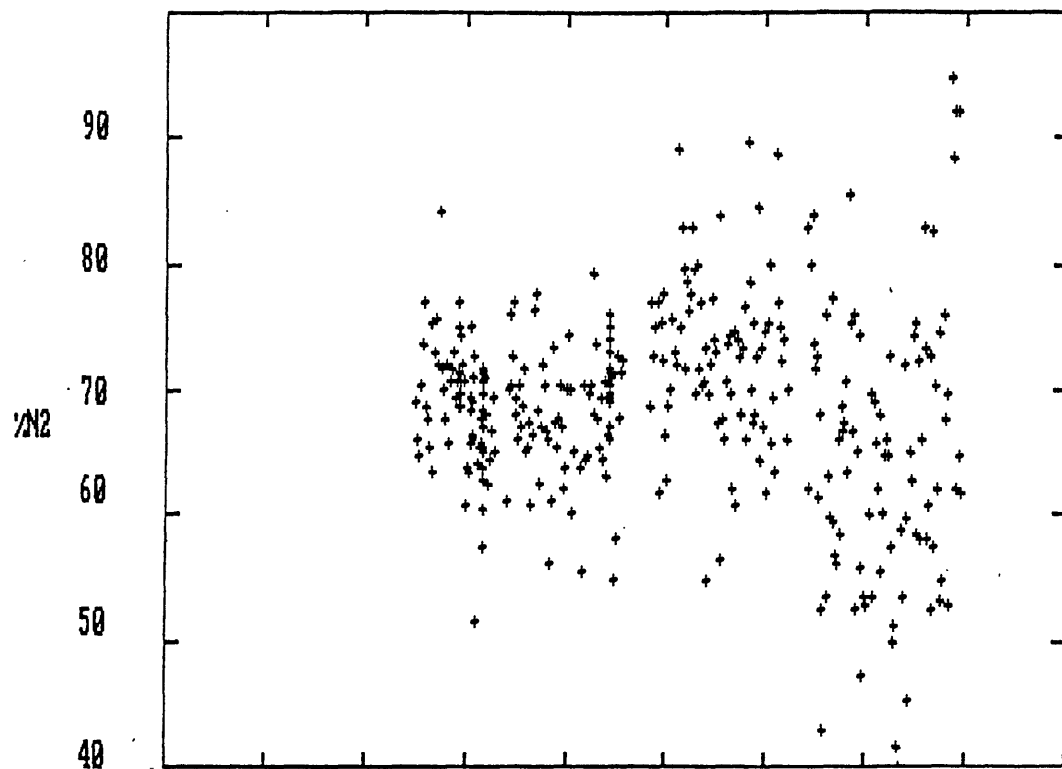
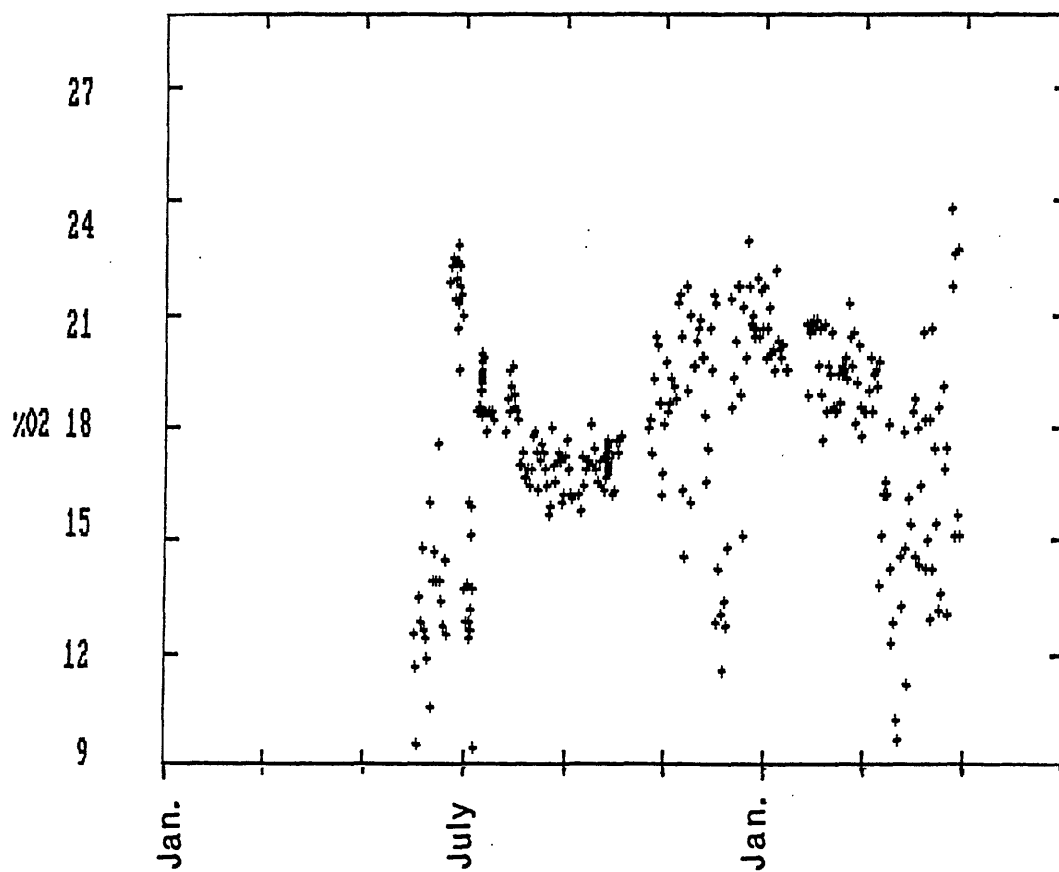


Fig. 2b. D2 (%)--2.0 m depth



Date (1989-1990)

Fig. 2c. CO₂ (%)--2.0 m depth

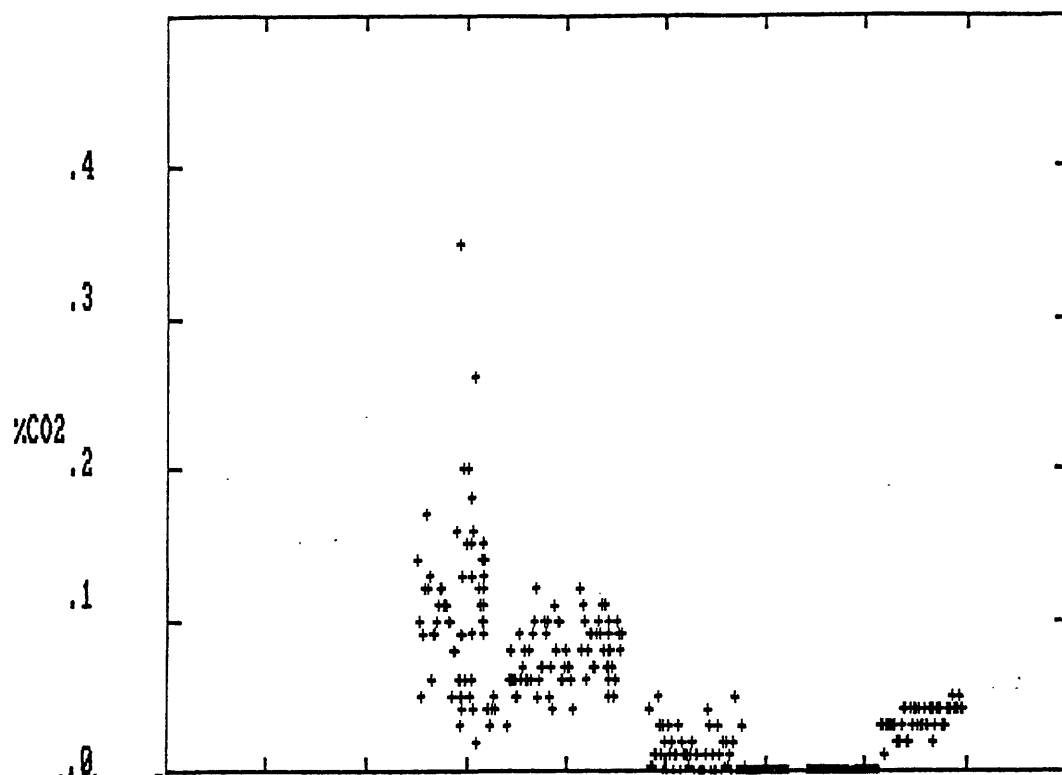


Fig. 2d. He (ppb)--2.0 m depth

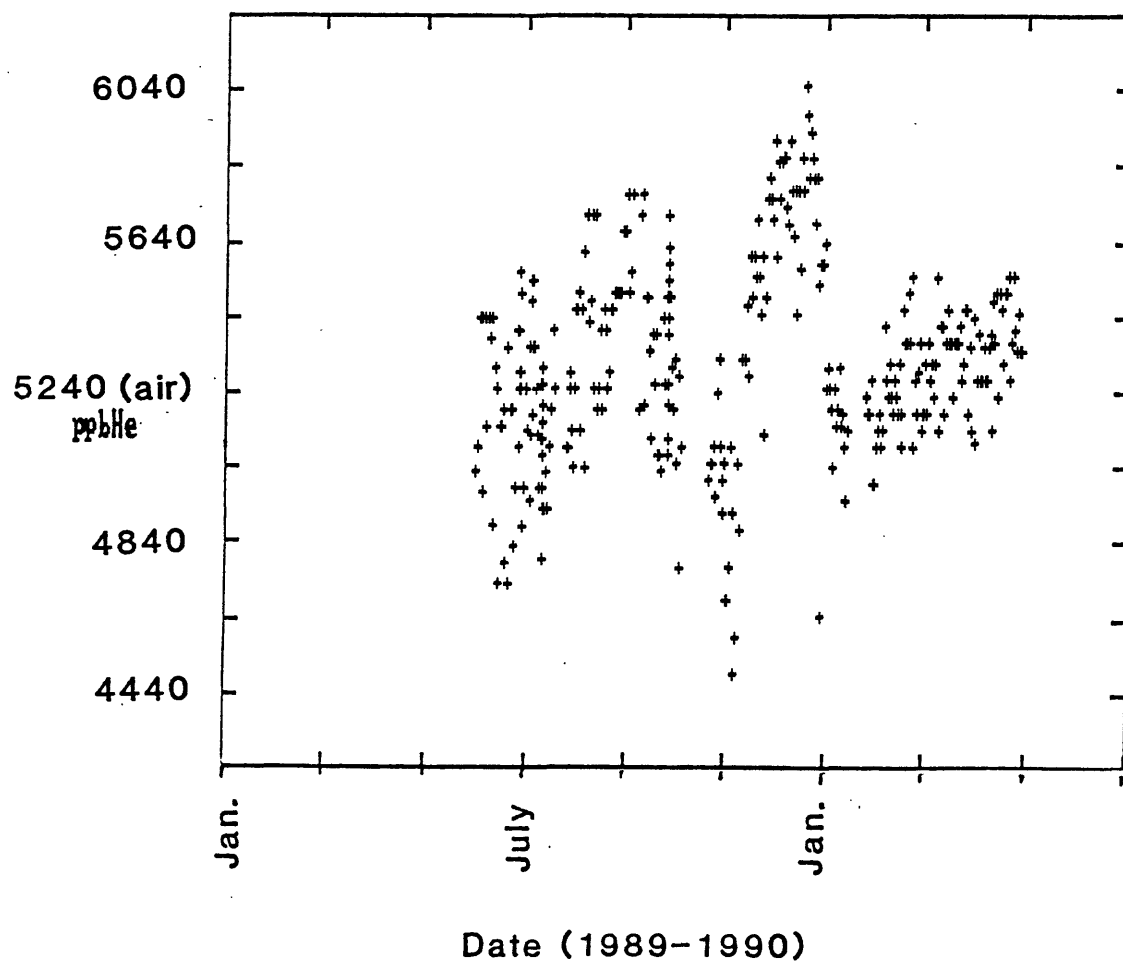


Fig. 3a. N2 (%)--1.2 m depth

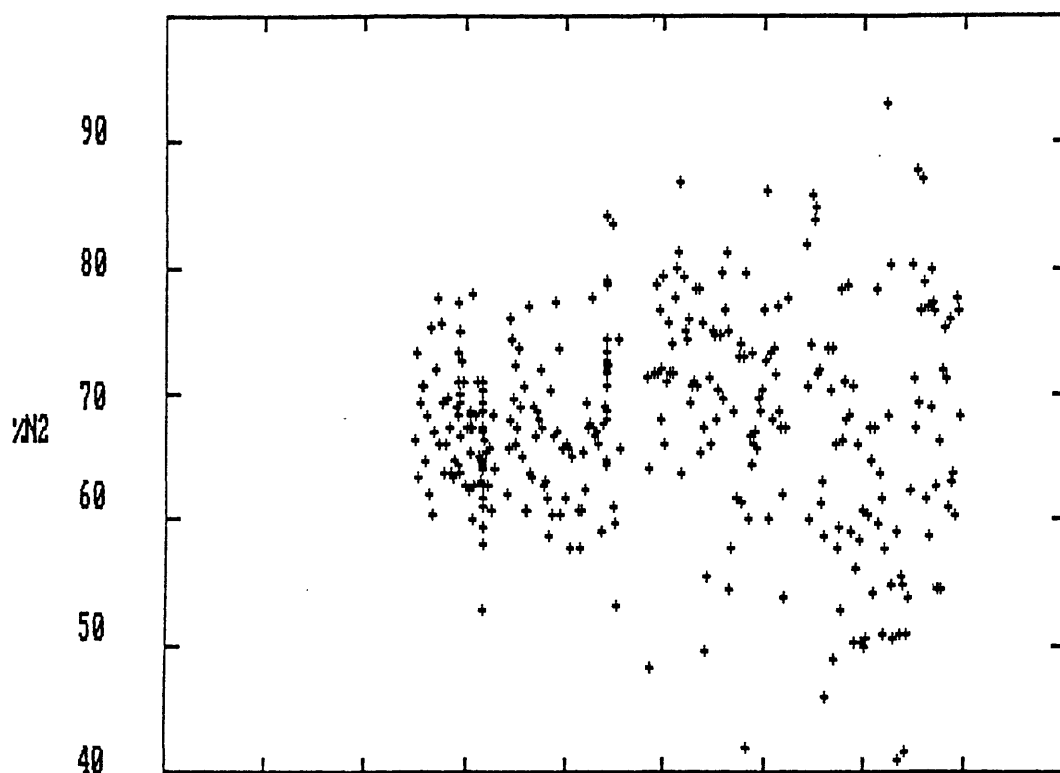


Fig. 3b. O2 (%)--1.2 m depth

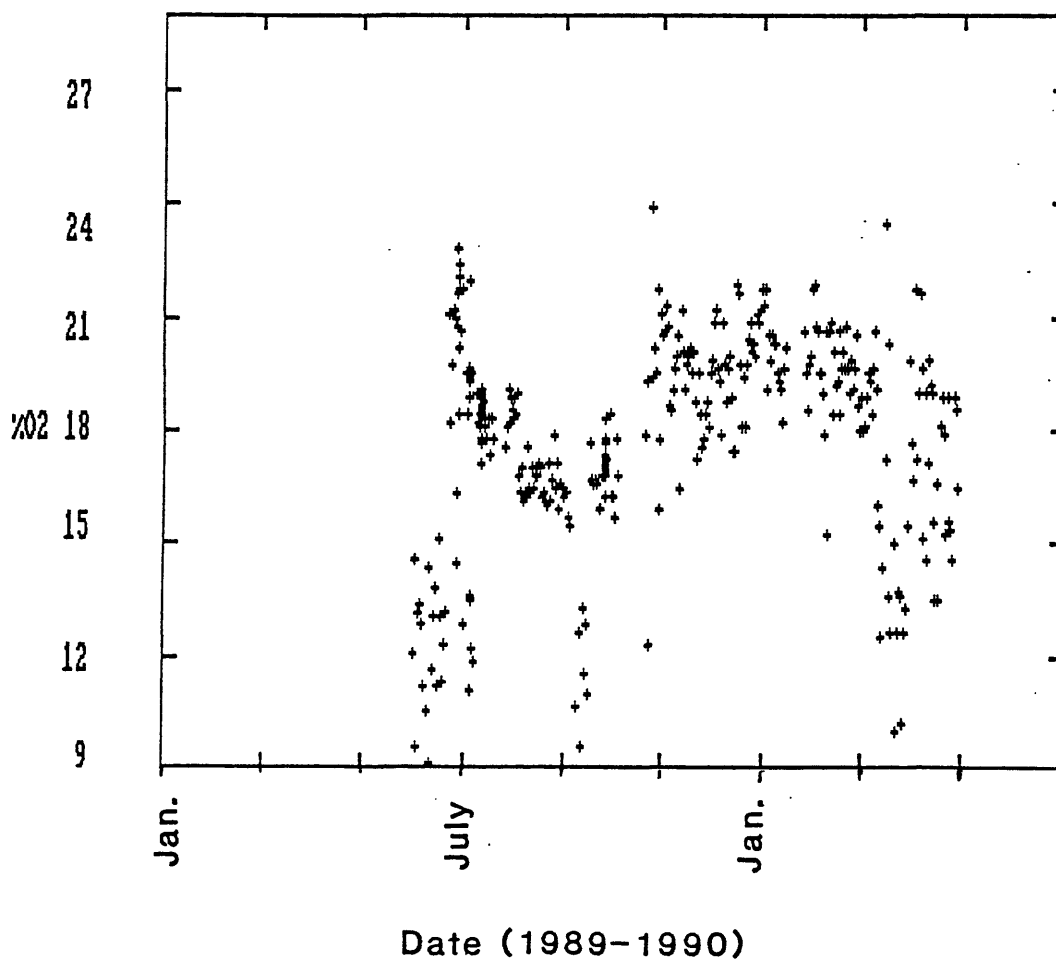


Fig. 3c. CO₂ (%)--1.2 m depth

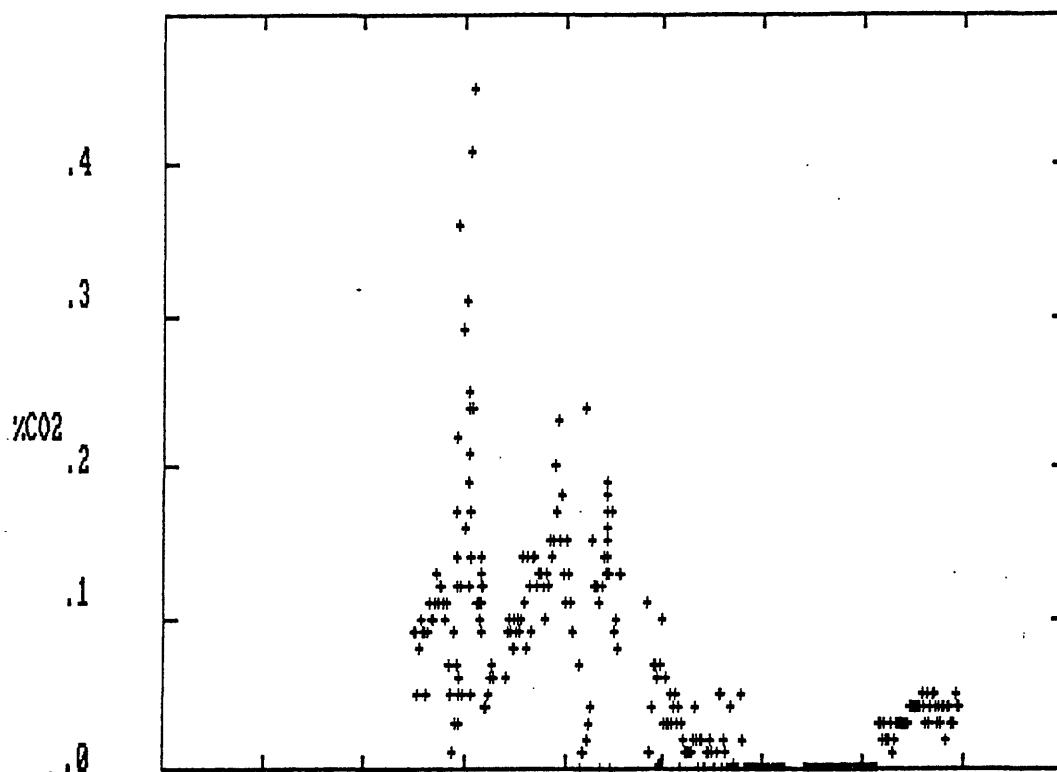


Fig. 3d. He (ppb)--1.2 m depth

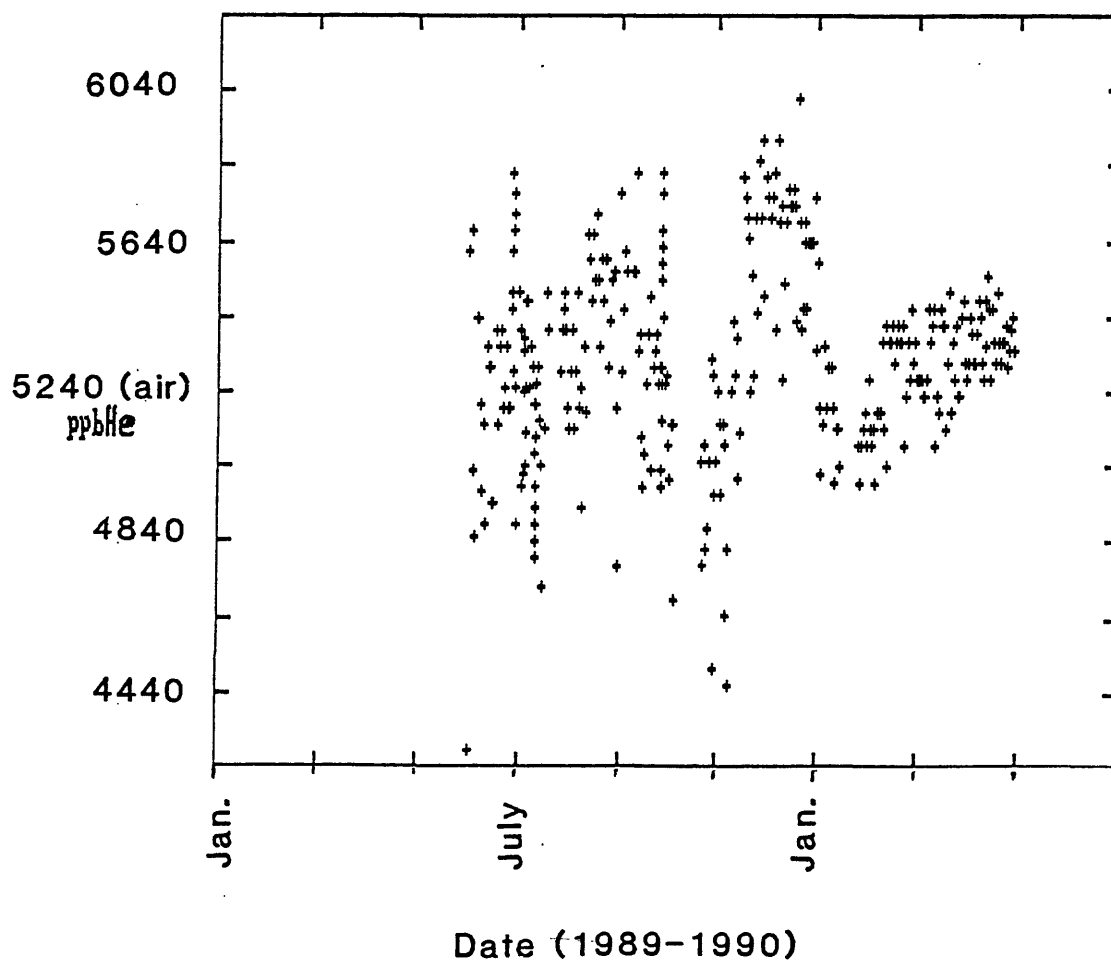


Fig. 4a. N2 (%)--0.6 m depth

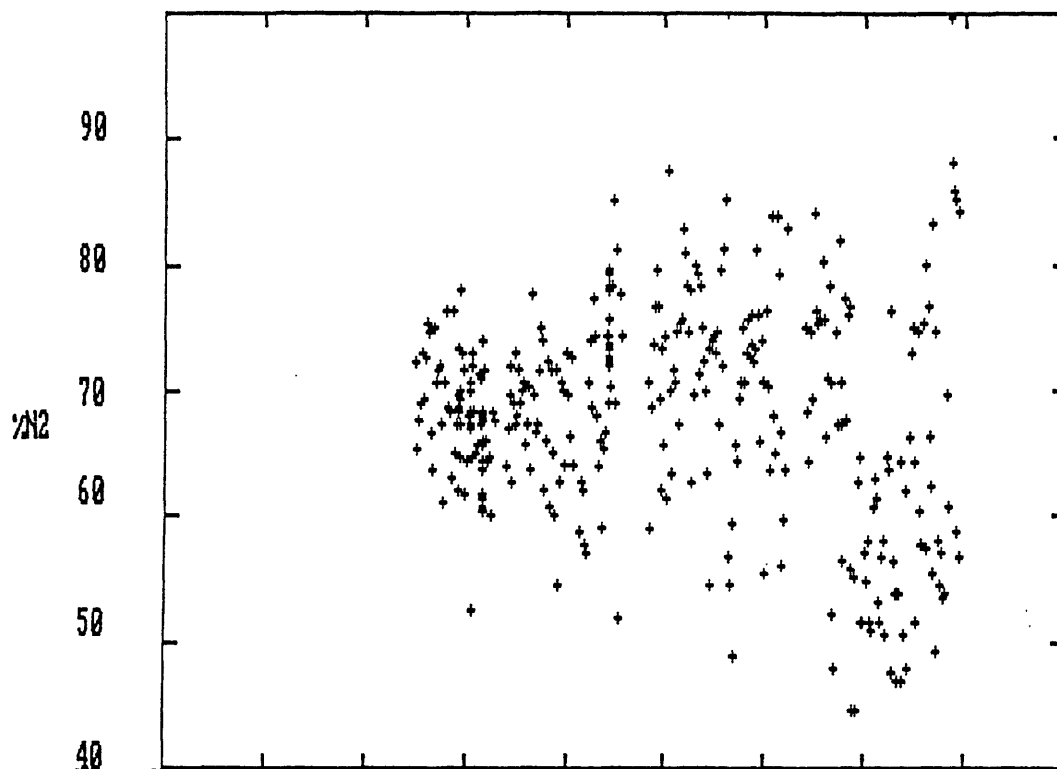


Fig. 4b. O2 (%)--0.6 m depth

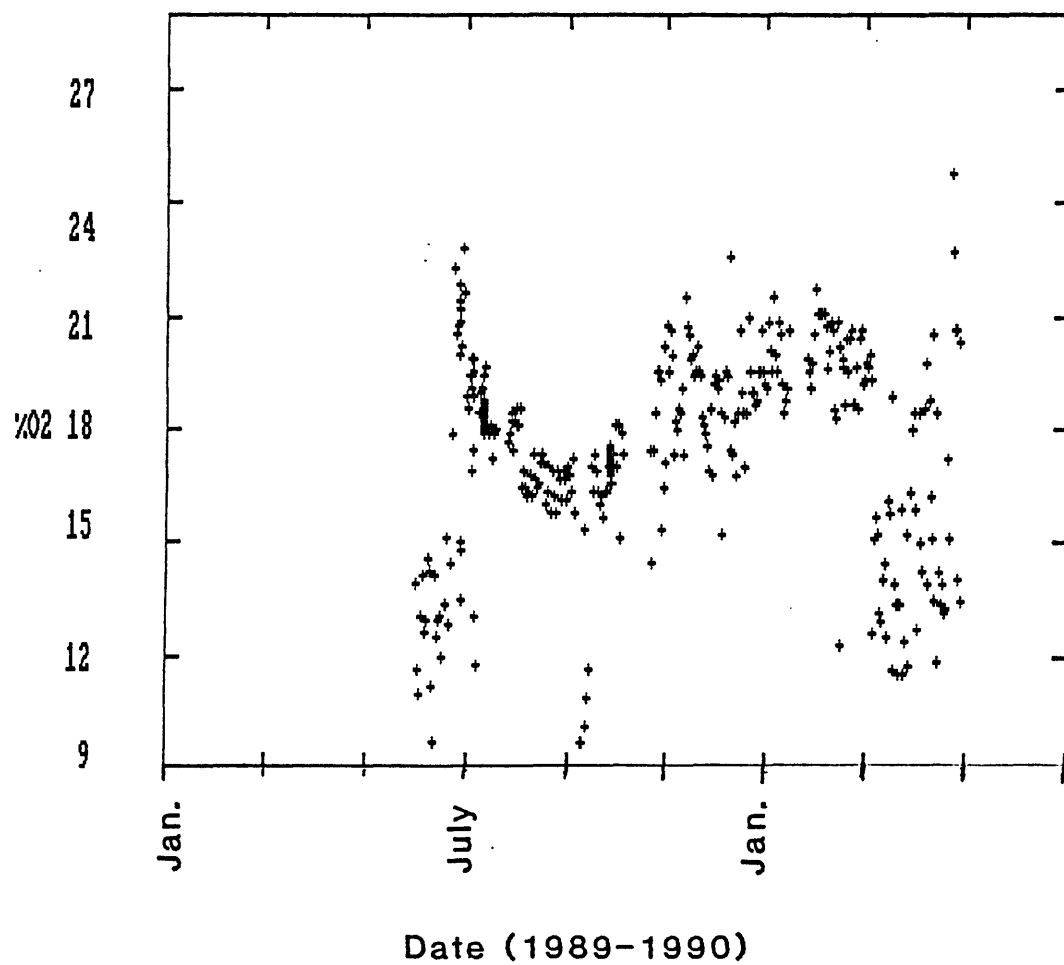


Fig. 4c. CO₂ (%)--0.6 m depth

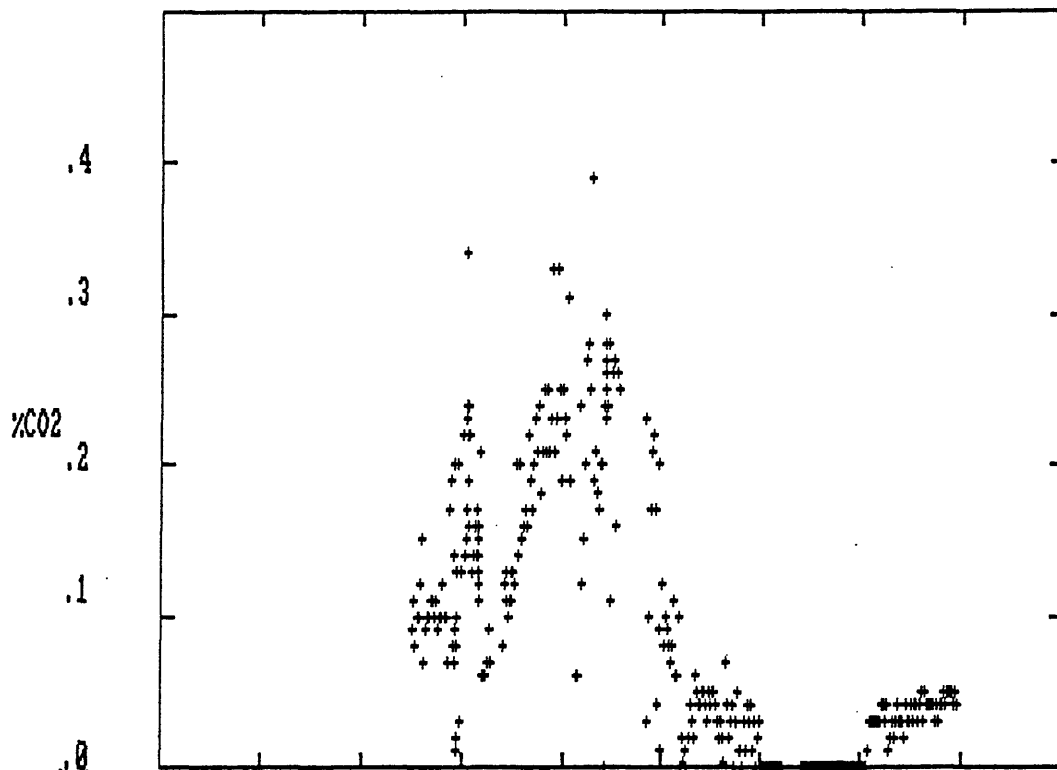


Fig. 4d. He (ppb)--0.6 m depth

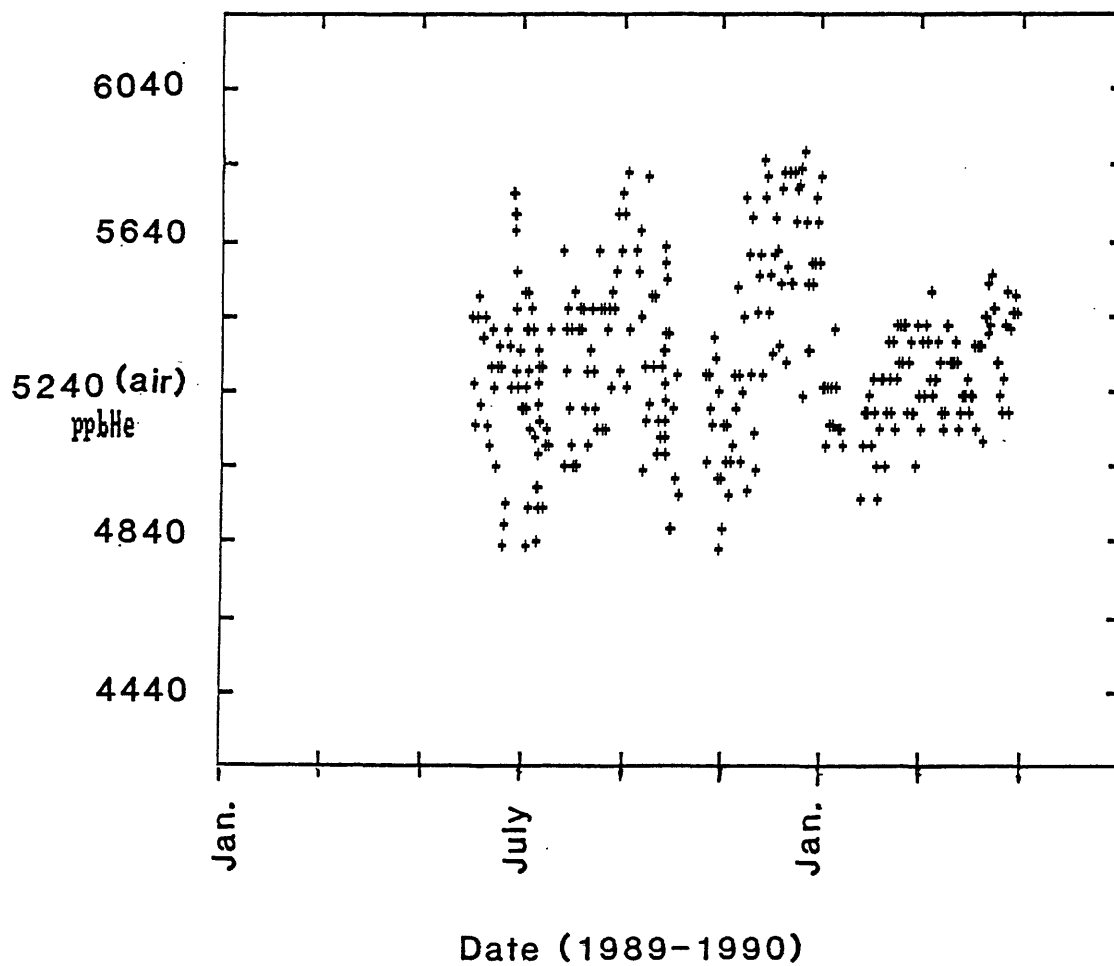


Fig. 5a. N2 (%)--0.3 m depth

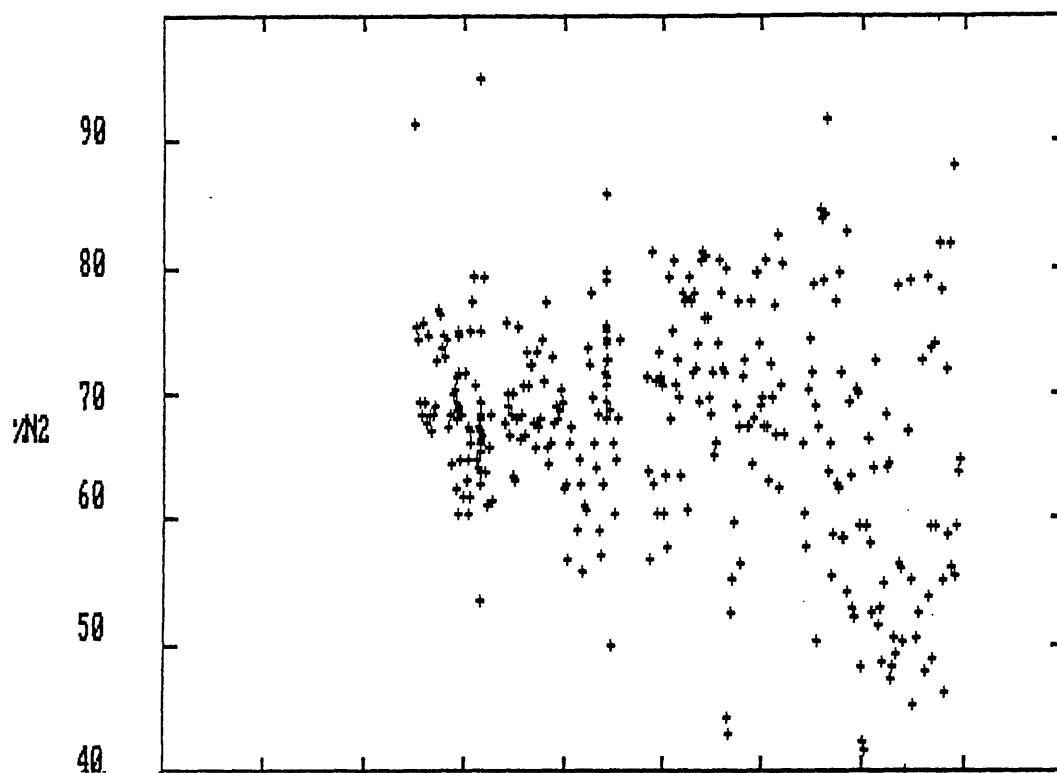
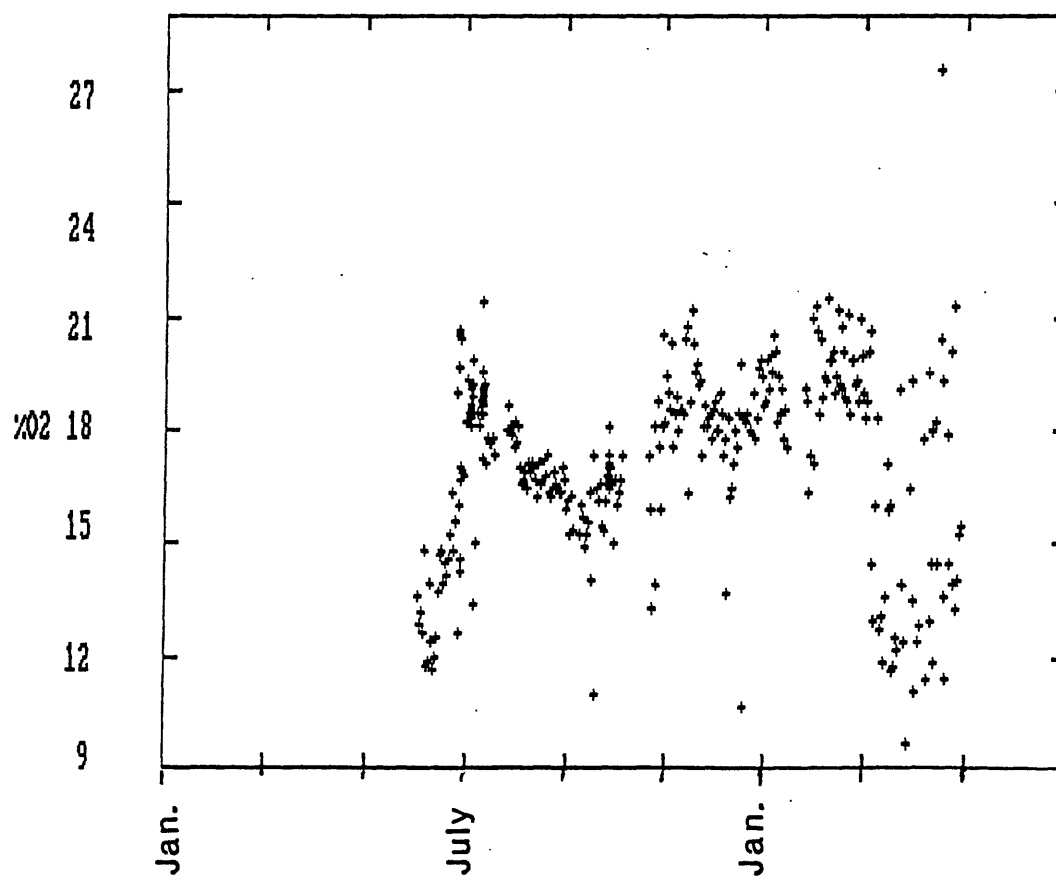


Fig. 5b. O2 (%)--0.3 m depth



Date (1989-1990)

Fig. 5c. CO₂ (%)--0.3 m depth

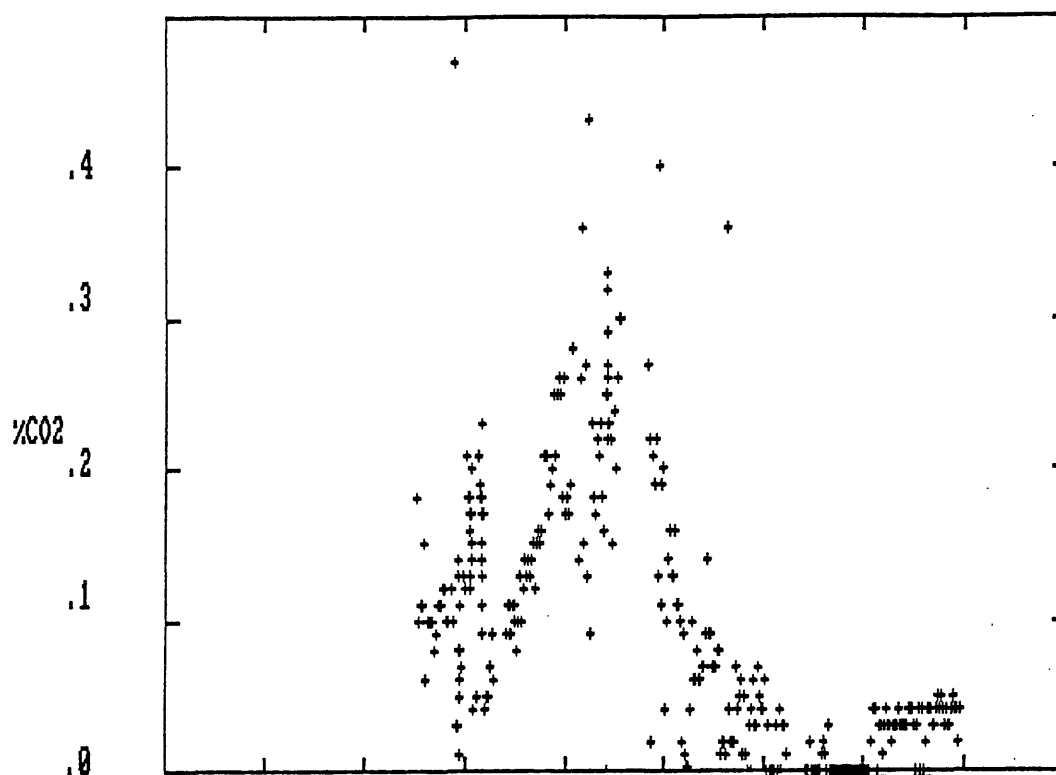


Fig. 5d. He (ppb)--0.3 m depth

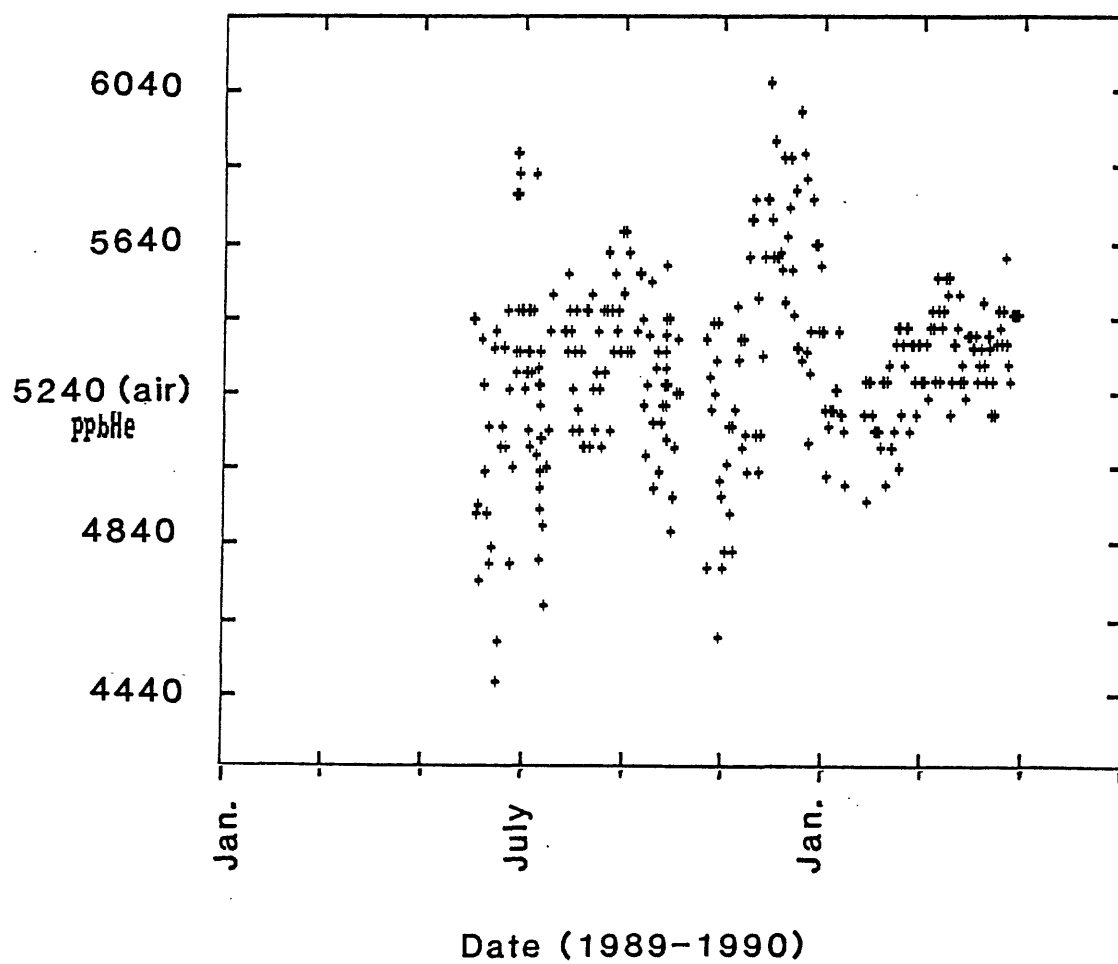


Table 1. Operating conditions for the gas chromatograph

[°C = degrees Celsius; mL = milliliter; in. = inches; % = percent]

Type of gas chromatograph	Carle AGC-100
Detector	thermistor detector
Lower limit of detection	1 % N ₂ or O ₂ , 0.03 % CO ₂
Reproducibility	± 5 %
Column	concentric stainless steel, outer column 72 in. x 1/4 in. molecular sieve inner column 72 in. x 1/8 in. porapak mixture (Alltech Associates, Deerfield, IL)
Carrier gas	helium at 60 mL/minute
Temperature	column: 60°C detector: "low" mode

Table 2. Soil Temperatures and Meteorology Data

Date	Time	T-20cm	T-5cm	T-Air	RelHum	BarPres	Rain	Snow	WindDir	WindSpd
53089	1545	18.0	B	13.0	55	75.95	0.3	0.0	330	24.1
53189	1500	17.5	B	19.0	24	76.28	0.5	0.0	30	14.8
60189	1450	17.5	B	21.5	30	76.58	1.8	0.0	350	18.5
60289	1545	17.5	B	27.0	16	76.20	0.1	0.0	340	11.1
60389	650	17.0	B	10.5	79	76.35	1.0	0.0	160	20.4
60489	810	17.0	B	9.0	100	76.33	3.1	0.0	350	20.4
60589	1500	17.0	B	25.0	25	76.23	0.5	0.0	130	13.0
60689	1810	17.0	B	18.0	32	75.92	0.1	0.0	150	11.1
60789	1945	15.0	B	18.0	25	76.12	0.0	0.0	110	11.1
60889	1450	17.5	B	13.0	64	76.07	0.0	0.0	310	29.6
60989	1530	17.5	B	23.0	32	76.07	0.1	0.0	60	18.5
61089	910	17.0	B	15.0	59	76.10	1.0	0.0	0	0.0
61189	755	17.0	B	17.5	51	76.10	0.1	0.0	200	9.3
61289	430	18.0	B	12.0	61	76.30	0.0	0.0	0	0.0
61389	1455	17.0	B	18.0	35	76.35	0.1	0.0	340	14.8
61489	1455	17.0	B	17.0	31	76.61	0.0	0.0	70	5.6
61589	1625	17.0	B	33.0	15	76.33	0.0	0.0	130	7.4
61689	1515	18.0	B	35.0	25	75.84	0.0	0.0	110	7.4
61789	1210	18.0	B	24.0	30	76.30	0.0	0.0	60	14.8
61889	740	18.0	B	17.0	50	76.50	0.0	0.0	360	5.6
61989	1510	19.0	B	30.0	31	76.12	0.0	0.0	170	16.7
62089	1505	19.0	23.5	31.0	29	75.82	0.0	0.0	150	14.8
62189	1810	18.0	16.5	8.0	100	76.48	0.3	0.0	360	14.8
62289	1525	17.0	19.5	24.0	30	76.25	0.0	0.0	190	7.4
62389	1435	17.0	18.0	18.0	40	76.23	0.0	0.0	280	5.6
62489	430	17.0	16.5	12.0	80	76.20	0.0	0.0	350	7.4
62489	740	17.0	16.5	15.0	54	76.20	0.0	0.0	360	7.4
62489	1035	17.0	17.0	19.5	50	76.17	0.0	0.0	360	13.0
62489	1235	17.0	17.5	22.0	40	76.20	0.0	0.0	20	18.5
62489	1505	17.0	18.0	19.0	50	76.23	0.0	0.0	360	31.5
62589	505	17.5	17.0	13.0	75	76.35	0.1	0.0	360	7.4
62589	755	17.5	17.0	16.0	55	76.33	0.0	0.0	190	7.4
62589	1200	17.5	18.0	24.0	40	76.12	0.0	0.0	130	20.4
62589	1500	17.5	19.5	23.0	37	76.10	0.0	0.0	10	33.3
62589	1800	18.0	20.5	22.0	33	76.05	0.0	0.0	350	13.0
62689	1515	18.0	20.0	19.4	41	76.23	0.1	0.0	150	20.4
62789	1540	18.0	21.0	33.0	24	76.15	0.0	0.0	160	13.0
62889	1520	18.0	19.5	24.5	36	76.33	0.0	0.0	105	13.0
62989	1440	18.0	19.0	22.0	35	76.63	0.0	0.0	350	24.1
63089	1500	18.0	21.0	32.0	27	76.25	0.0	0.0	240	11.1
70189	450	19.0	18.0	12.0	61	76.15	0.0	0.0	190	9.3
70189	1010	19.0	19.0	29.0	39	76.12	0.0	0.0	210	9.3
70189	1310	19.0	20.0	34.0	29	76.12	0.0	0.0	340	5.6
70189	1610	19.0	22.0	33.0	25	76.12	0.0	0.0	80	9.3
70189	1910	20.0	22.5	29.0	21	76.12	0.0	0.0	140	11.1
70289	430	20.0	18.2	16.0	35	76.25	0.0	0.0	210	5.6
70289	840	19.0	18.5	23.0	39	76.38	0.0	0.0	140	5.6
70289	1435	19.0	21.0	35.0	29	76.38	0.0	0.0	90	5.6
70289	1810	20.0	23.5	32.0	21	76.38	0.0	0.0	140	16.7
70389	1530	20.0	22.5	29.0	31	76.45	0.0	0.0	150	13.0
70489	1515	20.0	23.5	37.0	30	76.45	0.0	0.0	120	40.7

Table 2. Soil Temperatures and Meteorology Data

Date	Time	T-20cm	T-5cm	T-Air	RelHum	BarPres	Rain	Snow	WindDir	WindSpd
70589	1510	20.0	23.7	37.0	30	76.45	0.0	0.0	50	9.3
70689	1535	21.0	23.0	34.0	31	76.66	0.0	0.0	170	22.2
70789	1435	21.0	23.5	39.0	34	76.68	0.0	0.0	170	16.7
70789	1930	21.0	23.5	26.0	35	76.68	0.0	0.0	140	16.7
70889	400	21.0	21.0	17.0	50	76.58	0.0	0.0	200	13.0
70889	630	21.0	20.5	22.0	45	76.58	0.0	0.0	210	16.7
70889	930	21.0	21.5	29.0	45	76.58	0.0	0.0	220	11.1
70889	1135	21.0	22.0	34.0	40	76.53	0.0	0.0	130	11.1
70889	1335	21.0	22.5	33.0	37	76.45	0.0	0.0	360	11.1
70889	1540	21.0	23.5	32.0	34	76.40	0.0	0.0	210	27.8
70889	1740	21.0	23.0	32.0	34	76.40	0.0	0.0	300	22.2
70889	1945	21.0	23.0	27.0	36	76.35	0.0	0.0	130	11.1
70989	600	21.0	20.5	20.0	45	76.30	0.0	0.0	170	11.1
70989	910	21.0	21.0	27.0	45	76.28	0.0	0.0	200	18.5
70989	1115	21.0	21.5	32.0	39	76.20	0.0	0.0	140	25.9
70989	1310	21.0	21.5	34.0	35	76.20	0.0	0.0	150	37.0
70989	1510	21.0	23.5	35.0	30	76.12	0.0	0.0	140	27.8
70989	1730	21.0	24.5	33.0	25	76.12	0.0	0.0	130	24.1
70989	1910	21.0	24.0	26.0	26	76.12	0.0	0.0	150	22.2
71089	1530	21.0	22.5	27.0	49	76.12	0.0	0.0	280	20.4
71189	1510	21.0	23.0	32.0	40	76.58	0.0	0.0	350	7.4
71289	1440	21.0	21.5	21.0	50	76.89	0.5	0.0	190	18.5
71389	1505	20.0	22.0	29.0	40	76.58	0.1	0.0	0	0.0
71489	1535	20.0	23.0	30.0	35	76.45	0.0	0.0	30	18.5
71589	1810	21.0	23.5	27.0	32	76.48	0.0	0.0	170	18.5
71689	1145	21.0	21.0	27.0	51	76.33	0.0	0.0	40	13.0
72389	1650	21.0	22.5	26.0	42	76.53	0.0	0.0	150	11.1
72489	1650	21.0	22.0	24.0	46	76.50	0.0	0.0	110	14.8
72589	1450	21.0	22.0	26.0	44	76.43	0.0	0.0	150	9.3
72589	1750	21.0	21.0	18.0	64	76.43	0.6	0.0	190	18.5
72689	1700	20.0	22.5	30.0	35	76.58	0.1	0.0	110	14.8
72789	1710	21.0	22.5	27.0	39	76.48	0.0	0.0	280	13.0
72889	1505	20.0	23.0	33.0	39	76.33	0.0	0.0	140	5.6
72989	1810	21.0	20.5	17.0	100	76.30	2.3	0.0	10	25.9
72989	1825	20.0	20.0	15.0	100	76.55	1.0	0.0	310	27.8
73089	1700	20.0	20.0	18.0	100	76.61	2.3	0.0	360	14.8
73189	1640	19.0	21.0	23.0	40	76.61	0.0	0.0	90	16.7
80189	1800	20.0	20.5	21.0	70	76.20	0.1	0.0	210	14.8
80289	1510	20.0	21.0	24.0	55	76.17	0.5	0.0	240	9.3
80389	1610	20.0	21.5	28.0	35	76.12	0.3	0.0	360	9.5
80489	1530	20.0	21.5	27.0	36	76.20	0.0	0.0	300	14.8
80589	915	20.0	19.0	20.0	56	76.61	0.0	0.0	10	11.1
80689	1530	19.0	21.0	25.0	40	76.76	0.0	0.0	350	29.6
80789	1555	19.0	19.5	19.0	65	76.68	0.8	0.0	50	11.1
80889	1750	19.0	21.0	24.0	39	76.43	0.1	0.0	50	14.8
80989	1810	20.0	20.0	19.0	70	76.33	0.1	0.0	330	25.9
81089	1555	20.0	21.5	29.0	39	76.38	0.0	0.0	160	14.8
81189	1540	20.0	21.0	24.0	46	76.45	0.0	0.0	30	11.1
81289	1540	20.0	19.5	16.0	100	76.53	1.5	0.0	340	22.2
81389	1445	19.0	19.5	22.0	46	76.63	0.8	0.0	180	7.4
81489	1500	19.0	20.0	25.0	41	76.48	0.0	0.0	170	5.6

Table 2. Soil Temperatures and Meteorology Data

Date	Time	T-20cm	T-5cm	T-Air	RelHum	BarPres	Rain	Snow	WindDir	WindSpd
81589	1455	19.0	20.0	28.0	40	76.30	0.0	0.0	60	13.0
81689	1810	20.0	20.0	19.0	50	76.28	0.6	0.0	180	18.5
81789	1605	19.0	20.0	24.0	40	76.28	0.3	0.0	330	20.4
81889	1410	19.0	20.0	28.0	42	76.20	0.0	0.0	270	7.4
81989	1350	19.0	19.0	20.0	50	76.38	0.0	0.0	310	40.7
82089	1540	19.0	20.5	20.0	40	76.10	0.0	0.0	360	9.3
82189	1540	19.0	20.5	24.0	40	76.10	0.0	0.0	270	13.0
82289	1550	19.0	20.5	26.0	40	76.33	0.0	0.0	120	9.3
82389	1450	19.0	20.5	31.0	40	76.12	0.0	0.0	110	11.1
82489	1650	19.0	21.0	26.0	40	75.82	0.0	0.0	15	37.0
82589	1440	19.0	20.0	28.0	42	76.00	0.0	0.0	9	16.7
82689	1425	19.0	19.5	24.0	46	76.28	0.0	0.0	140	27.8
82789	1355	19.0	19.5	25.0	50	76.28	0.0	0.0	180	18.5
82889	1545	19.0	21.0	27.0	35	76.33	0.0	0.0	150	22.2
82989	1455	19.0	21.0	31.0	40	76.33	0.0	0.0	130	24.1
83089	1550	20.0	22.0	32.0	35	75.92	0.0	0.0	80	9.3
83189	1440	20.0	21.5	33.0	40	75.95	0.0	0.0	120	11.1
90589	1540	20.0	22.0	32.0	40	76.28	0.0	0.0	150	9.3
90689	1545	20.0	22.0	27.0	40	76.10	0.0	0.0	360	25.9
90789	1450	20.0	21.0	24.0	50	76.07	0.0	0.0	110	9.3
90889	1740	20.0	18.0	11.0	100	76.10	2.3	0.0	20	16.7
90989	1310	18.0	16.5	10.0	70	74.52	2.4	0.0	80	13.0
91089	900	18.0	15.5	11.0	90	76.10	0.5	0.0	210	18.5
91189	1500	16.0	14.0	6.0	100	76.23	2.0	0.0	60	14.8
91289	1500	15.0	12.5	3.0	100	76.56	1.3	0.0	20	16.7
91389	1450	14.0	14.0	16.0	45	76.58	0.9	0.0	20	7.4
91489	1450	14.0	16.0	22.0	40	76.58	0.1	0.0	80	14.8
91589	1450	15.0	17.0	27.0	40	76.35	0.0	0.0	140	14.8
91689	1310	16.0	16.5	26.0	50	76.35	0.0	0.0	160	22.2
91789	1305	16.0	17.5	28.0	50	76.00	0.0	0.0	170	14.8
91889	1450	17.0	19.0	28.0	45	75.82	0.0	0.0	260	27.8
91989	1540	17.0	19.5	24.0	40	76.20	0.0	0.0	20	6.0
92089	1450	18.0	18.0	18.0	55	75.95	0.0	0.0	150	18.5
92189	1455	17.0	17.0	15.0	50	76.56	0.0	0.0	10	11.1
92289	355	17.0	15.0	8.0	80	76.84	0.0	0.0	B	B
92289	455	17.0	16.0	7.0	80	76.84	0.0	0.0	280	18.5
92289	555	17.0	15.0	6.0	80	76.84	0.0	0.0	290	20.4
92289	655	17.0	15.0	10.0	75	76.89	0.0	0.0	280	14.8
92289	755	17.0	15.0	12.0	70	76.91	0.0	0.0	310	18.5
92289	855	17.0	16.0	13.0	60	76.96	0.0	0.0	330	25.9
92289	955	17.0	16.0	14.0	58	76.96	0.0	0.0	360	22.2
92289	1055	16.0	16.0	16.0	58	76.96	0.0	0.0	350	14.8
92289	1155	16.0	16.0	18.0	58	76.99	0.0	0.0	10	18.5
92289	1255	16.0	16.0	19.0	55	76.99	0.0	0.0	20	18.5
92289	1355	16.0	16.0	20.0	50	76.96	0.0	0.0	330	18.5
92289	1455	16.0	17.0	20.0	40	76.96	0.0	0.0	20	27.8
92289	1555	16.0	17.0	21.0	40	76.96	0.0	0.0	330	24.1
92289	1655	16.0	18.0	17.0	40	76.96	0.0	0.0	350	16.7
92289	1755	17.0	17.0	15.0	45	76.96	0.0	0.0	40	18.5
92289	1855	17.0	17.0	14.0	50	76.96	0.0	0.0	40	22.2
92389	1445	16.0	17.0	21.0	45	76.63	0.0	0.0	140	16.7

Table 2. Soil Temperatures and Meteorology Data

Date	Time	T-20cm	T-5cm	T-Air	RelHum	BarPres	Rain	Snow	WindDir	WindSpd
92489	1410	16.0	17.0	28.0	45	76.38	0.0	0.0	20	25.9
92589	1500	17.0	17.5	27.0	42	76.73	0.0	0.0	70	9.3
92689	1455	17.0	18.0	29.0	40	76.58	0.0	0.0	60	14.8
92789	1450	17.0	18.0	28.0	40	76.61	0.0	0.0	40	16.7
92889	1405	18.0	18.0	30.0	42	76.71	0.0	0.0	360	20.4
92989	1250	17.0	18.0	23.0	56	76.76	0.0	0.0	10	9.3
93089	1250	17.0	18.0	30.0	50	76.15	0.0	0.0	110	18.5
101689	1500	15.0	12.0	2.0	100	76.43	0.0	4.5	60	14.8
101789	1500	13.0	12.0	2.0	90	76.84	0.0	0.0	330	7.4
101889	1500	13.0	12.0	6.0	60	77.14	0.0	0.0	0	0.0
101989	1450	12.0	12.0	20.0	45	76.84	0.0	0.0	130	9.3
102089	1500	13.0	14.0	22.0	40	76.23	0.0	0.0	310	27.8
102189	1445	13.0	14.0	21.0	50	76.12	0.0	0.0	360	14.8
102289	1400	13.0	15.0	22.0	50	76.33	0.0	0.0	70	18.5
102389	1500	14.0	16.0	24.0	45	76.58	0.0	0.0	40	13.0
102489	1500	14.0	16.0	24.0	40	76.33	0.0	0.0	40	9.3
102589	1455	14.0	14.0	20.0	50	75.82	0.0	0.0	340	14.8
102689	1500	14.0	14.0	13.0	45	75.74	0.0	0.0	260	37.0
102789	1300	14.0	13.0	19.5	50	76.17	0.0	0.0	110	14.8
102889	1255	13.0	13.0	15.0	50	75.74	0.0	0.0	320	18.5
102989	1250	13.0	11.0	8.0	60	76.33	0.0	0.0	30	27.8
103089	1600	12.0	10.0	9.0	55	76.25	0.0	0.0	270	22.2
103189	1605	12.0	11.0	7.0	50	76.07	0.0	0.0	30	37.0
110189	1600	11.0	10.0	2.0	60	76.78	1.0	7.5	180	13.0
110289	1600	10.0	10.0	13.0	60	76.45	0.0	0.0	280	11.1
110389	1550	10.0	10.0	11.0	50	75.87	0.0	0.0	260	27.8
110489	1000	10.0	10.0	14.0	50	75.57	0.0	0.0	230	51.9
110589	1245	11.0	11.0	15.0	55	75.82	0.0	0.0	130	20.4
110689	1555	11.0	11.0	17.0	47	75.84	0.0	0.0	260	27.8
110789	1555	11.0	10.0	14.0	45	75.44	0.0	0.0	270	27.8
110889	1600	10.0	10.0	12.0	42	75.72	0.0	0.0	270	55.6
110989	1555	11.0	12.0	16.0	50	76.10	0.0	0.0	250	38.9
111089	1500	12.0	14.0	22.0	45	76.15	0.0	0.0	270	22.2
111189	1100	13.0	13.0	21.0	47	76.17	0.0	0.0	270	25.9
111289	1200	13.0	14.0	25.0	45	75.84	0.0	0.0	270	25.9
111389	1600	14.0	16.0	21.0	47	75.77	0.0	0.0	260	13.0
111489	1600	13.0	12.0	14.0	55	75.67	0.0	0.0	260	46.3
111589	1600	11.0	11.0	5.0	62	75.58	0.0	0.0	50	20.4
111689	1550	10.0	10.0	11.0	55	75.92	0.0	0.0	280	9.3
111789	1550	10.0	11.0	13.0	52	76.07	0.0	0.0	60	16.7
111889	1145	10.0	10.0	12.0	47	76.15	0.0	0.0	260	40.7
111989	755	11.0	10.0	12.0	55	76.33	0.0	0.0	270	27.8
112089	1550	13.0	14.0	19.0	50	76.61	0.0	0.0	60	18.5
112189	1550	12.0	14.0	23.0	47	75.72	0.0	0.0	90	14.8
112289	1550	12.0	12.0	10.0	60	76.45	0.0	0.0	110	14.8
112389	855	11.0	9.0	2.0	70	75.90	0.0	0.0	250	11.1
112489	1655	11.0	11.0	11.0	50	75.26	0.0	0.0	240	37.0
112589	745	11.0	10.0	1.0	87	75.62	0.0	1.3	180	22.2
112689	1150	10.0	10.0	11.0	75	75.08	0.0	0.0	40	16.7
112789	1550	10.0	10.0	-2.0	80	76.23	0.0	0.0	40	27.8
112889	1545	10.0	10.0	8.0	50	76.61	0.0	0.0	130	13.0

Table 2. Soil Temperatures and Meteorology Data

Date	Time	T-20cm	T-5cm	T-Air	RelHum	BarPres	Rain	Snow	WindDir	WindSpd
112989	1545	9.0	10.0	12.0	47	76.86	0.0	0.0	130	14.8
113089	1550	9.0	10.0	10.0	47	76.56	0.0	0.0	350	9.3
120189	1555	10.0	10.0	10.0	47	76.81	0.0	0.0	10	7.4
120289	850	9.0	8.0	2.0	60	77.09	0.0	0.0	340	25.9
120389	945	9.0	8.0	10.0	57	76.71	0.0	0.0	190	13.0
120489	1645	10.0	11.0	11.0	45	76.10	0.0	0.0	270	33.3
120589	1645	12.0	13.0	11.0	50	75.79	0.0	0.0	270	37.0
120689	1550	11.0	11.0	4.0	55	75.87	0.0	0.0	90	9.3
120789	1805	10.0	9.0	-2.0	85	76.56	0.0	1.0	300	9.3
120889	1550	10.0	10.0	16.0	47	75.92	0.0	0.0	330	9.3
120989	845	10.0	9.0	8.0	50	75.87	0.0	0.0	130	22.2
121089	1450	10.0	9.0	-5.0	100	76.02	0.0	15.2	340	14.8
121189	1550	9.0	7.0	-6.0	62	76.33	0.0	0.0	210	13.0
121289	1550	8.0	6.0	-2.0	60	75.87	0.0	0.0	260	55.6
121389	1600	7.0	6.0	2.0	55	75.87	0.0	0.0	260	37.0
121489	1545	7.0	6.0	5.0	60	75.41	0.0	0.0	280	29.6
121589	1550	7.0	4.0	-5.0	75	76.05	0.0	1.0	190	11.1
121689	1200	6.0	4.0	-6.0	80	75.87	0.0	0.0	360	22.2
121789	1400	6.0	4.0	-5.0	75	75.41	0.0	0.0	340	13.0
121889	1555	6.0	4.0	-10.0	75	75.77	0.0	7.6	0	0.0
121989	1555	6.0	4.0	-3.0	70	75.69	0.0	0.0	330	9.3
122089	1750	6.0	5.0	-9.0	70	76.20	0.0	0.0	60	27.8
122189	1510	5.0	2.0	-16.0	70	76.71	0.0	0.0	330	18.5
122289	1255	3.0	0.0	-10.0	70	76.76	0.0	0.0	230	9.3
122389	950	3.0	2.0	4.0	70	76.56	0.0	0.0	250	33.3
122489	1040	6.0	5.0	5.0	60	76.91	0.0	0.0	160	22.2
122589	1255	6.0	6.0	8.0	55	76.61	0.0	0.0	320	22.2
122689	1505	7.0	9.0	15.0	45	76.25	0.0	0.0	260	33.3
122789	1550	8.0	9.0	10.0	60	76.07	0.0	0.0	350	18.5
122889	1545	8.0	10.0	8.0	50	75.67	0.0	0.0	310	11.1
122989	1445	8.0	9.0	4.0	70	75.95	0.0	0.0	90	18.5
123089	1345	7.0	7.0	0.0	75	75.95	0.0	1.0	50	18.5
123189	1550	7.0	7.0	6.0	60	76.12	0.0	3.0	160	24.1
10190	1445	8.0	9.0	11.0	50	75.87	0.0	0.0	60	11.1
10290	1550	8.0	10.0	9.0	45	75.34	0.0	0.0	90	14.8
10390	1550	8.0	7.0	-1.0	65	75.77	0.0	0.0	100	11.1
10490	1555	7.0	7.0	6.0	57	76.02	0.0	0.0	350	7.4
10590	1545	7.0	8.0	8.0	50	76.33	0.0	0.0	30	11.1
10690	1345	7.0	8.0	15.0	50	76.12	0.0	0.0	0	0.0
10790	1450	8.0	9.0	14.0	42	75.87	0.0	0.0	260	40.7
10890	1545	9.0	10.0	14.0	50	75.34	0.0	0.0	260	59.3
11990	1400	8.0	6.0	-2.0	100	75.77	0.0	8.0	360	18.5
12090	1550	8.0	7.0	9.0	60	75.90	0.0	2.0	230	14.8
12190	1255	8.0	7.0	13.0	50	76.07	0.0	0.0	250	27.8
12290	1550	8.0	9.0	12.0	50	75.57	0.0	0.0	280	14.8
12390	1555	8.0	8.0	7.0	50	75.44	0.0	0.0	250	27.8
12490	1550	8.0	5.0	0.0	50	76.02	0.0	0.0	330	27.8
12590	1555	7.0	6.0	9.0	50	75.82	0.0	0.0	250	40.7
12690	1550	8.0	10.0	16.0	45	75.06	0.0	0.0	350	14.8
12790	1400	8.0	5.0	2.0	45	76.05	0.0	0.0	310	46.3
12890	1240	7.0	4.0	4.0	45	76.02	0.0	0.0	300	33.3

Table 2. Soil Temperatures and Meteorology Data

Date	Time	T-20cm	T-5cm	T-Air	RelHum	BarPres	Rain	Snow	WindDir	WindSpd
12990	1550	7.0	8.0	6.0	45	75.11	0.0	0.0	310	27.8
13090	1550	7.0	9.0	13.0	47	75.18	0.0	0.0	310	18.5
13190	1550	8.0	10.0	14.0	47	75.08	0.0	0.0	340	24.1
20190	1545	8.0	7.0	3.0	70	75.29	0.0	0.0	340	22.2
20290	1600	7.0	6.0	1.0	70	75.77	0.0	5.5	360	20.4
20390	1300	6.0	4.0	6.0	55	76.17	0.0	0.0	200	11.1
20490	1345	7.0	7.0	13.0	47	75.87	0.0	0.0	160	16.7
20590	1450	7.0	6.0	4.0	55	75.82	0.0	0.0	90	20.4
20690	1445	7.0	8.0	16.0	50	75.84	0.0	0.0	50	13.0
20790	1350	7.0	8.0	19.0	45	75.49	0.0	0.0	290	33.3
20890	1250	8.0	6.0	7.0	60	75.41	0.0	0.0	250	37.0
20990	1450	8.0	8.0	11.0	45	75.77	0.0	0.0	250	37.0
21090	1450	9.0	10.0	12.0	50	75.87	0.0	0.0	250	44.4
21190	1430	10.0	12.0	20.0	45	76.17	0.0	0.0	20	18.5
21290	1440	10.0	12.0	18.0	42	75.08	0.0	0.0	70	25.9
21390	1335	10.0	7.0	-3.0	90	75.46	0.0	3.0	60	18.5
21490	1345	8.0	6.0	1.0	90	75.31	0.0	7.0	340	18.5
21590	1345	6.0	4.0	2.0	80	75.11	0.0	1.0	360	7.4
21690	1055	6.0	2.0	-2.0	55	75.77	0.0	0.0	200	16.7
21790	1350	6.0	6.0	10.0	50	75.46	0.0	0.0	90	9.3
21890	1450	7.0	7.0	4.0	55	76.15	0.0	0.0	100	22.2
21990	1450	7.0	8.0	7.0	70	76.40	0.0	0.0	340	22.2
22090	1455	8.0	9.0	9.0	65	76.20	0.0	0.0	350	14.8
22190	1455	8.0	10.0	8.0	55	76.02	0.0	0.0	10	27.8
22290	1455	8.0	10.0	15.0	55	76.23	0.0	0.0	50	11.1
22390	1500	9.0	13.0	18.0	45	76.53	0.0	0.0	70	22.2
22490	1350	10.0	10.0	11.0	55	76.63	0.0	0.0	10	11.1
22590	1255	10.0	10.0	16.0	50	76.45	0.0	0.0	90	22.2
22690	1550	10.0	10.0	9.0	55	76.48	0.0	0.0	20	31.5
22790	1735	10.0	8.0	0.0	85	76.94	0.0	0.5	350	22.2
22890	1745	9.0	7.0	0.0	80	76.86	0.0	0.0	350	11.1
30190	1645	9.0	11.0	8.0	55	76.35	0.0	0.0	50	22.2
30290	1550	13.0	13.0	19.0	40	76.33	0.0	0.0	50	11.1
30390	1545	10.0	12.0	14.0	45	75.84	0.0	0.0	170	11.1
30490	1445	10.0	14.0	20.0	45	75.79	0.0	0.0	20	31.5
30590	1555	11.0	13.0	9.0	60	75.34	0.0	0.0	330	20.4
30690	1445	10.0	6.0	0.0	100	75.23	2.5	14.0	360	29.0
30790	1550	8.0	6.0	1.0	75	76.02	0.0	45.0	10	11.1
30890	1740	6.0	4.0	7.0	55	75.90	0.0	0.0	180	18.5
30990	1550	6.0	4.0	11.0	55	75.95	0.0	0.0	290	16.7
31090	1645	7.0	9.0	12.0	50	75.59	0.0	0.0	230	11.1
31190	1255	8.0	7.0	14.0	50	75.06	0.0	0.0	230	11.1
31290	1545	8.0	10.0	12.0	50	75.44	0.0	0.0	350	18.5
31390	1550	8.0	8.0	0.0	100	75.29	0.0	5.0	360	24.1
31490	1550	7.0	7.0	4.0	55	75.34	0.0	0.0	320	18.5
31590	1730	7.0	7.0	4.0	50	75.72	0.0	0.0	250	33.3
31690	1550	7.0	10.0	14.0	45	76.15	0.0	0.0	30	7.4
31790	1450	8.0	8.0	7.0	60	75.97	0.0	0.0	340	22.2
31890	1445	8.0	8.0	5.0	65	76.58	0.0	2.5	160	13.0
31990	1550	8.0	12.0	21.0	40	76.68	0.0	0.0	110	18.5
32090	1600	10.0	12.0	18.0	40	76.45	0.0	0.0	200	11.1

Table 2. Soil Temperatures and Meteorology Data

Date	Time	T-20cm	T-5cm	T-Air	RelHum	BarPres	Rain	Snow	WindDir	WindSpd
32190	1550	10.0	12.0	20.0	45	76.02	0.0	0.0	300	24.1
32290	1550	10.0	14.0	18.0	50	76.20	0.0	0.0	350	25.9
32390	1545	10.0	7.0	-3.0	100	76.20	0.0	0.2	350	14.8
32490	1235	8.0	6.0	-4.0	70	76.61	0.0	2.5	80	11.1
32590	1745	8.0	7.0	0.0	70	76.71	0.0	0.0	360	33.3
32690	1645	8.0	10.0	9.0	65	76.38	0.0	0.0	340	14.8
32790	1545	10.0	10.0	13.0	55	75.74	0.0	0.0	330	27.8
32890	1545	10.0	9.0	3.0	85	76.02	1.0	0.0	360	13.0
32990	1555	9.0	8.0	2.0	100	75.92	3.5	0.0	30	9.3
33090	1555	9.0	9.0	3.0	85	75.84	1.0	0.0	80	13.0
33190	1545	9.0	11.0	16.0	45	75.84	0.0	0.0	30	7.4
40190	1345	10.0	12.0	14.0	55	76.45	0.0	0.0	340	18.5
40290	1450	11.0	14.0	24.0	40	76.35	0.0	0.0	20	14.8
40390	1545	12.0	16.0	21.0	40	76.20	0.0	0.0	60	25.9
40490	1445	12.0	13.0	14.0	60	76.05	0.0	0.0	320	27.8
40590	1545	12.0	10.0	0.0	85	76.15	1.0	7.0	90	16.1
40690	1555	10.0	12.0	15.0	60	76.12	0.0	0.0	140	13.0
40790	1505	10.0	13.0	18.0	50	76.10	0.0	0.0	60	16.7
40890	1750	12.0	13.0	12.0	60	75.67	0.0	0.0	220	18.5
40990	1455	12.0	11.0	5.0	90	76.12	0.5	0.0	10	25.9
41090	1450	10.0	9.0	2.0	95	76.81	0.0	0.0	100	9.3
41190	1600	10.0	10.0	10.0	65	76.38	0.0	0.0	310	18.5
41290	1500	11.0	12.0	19.0	45	75.84	0.0	0.0	290	18.5
41390	1505	12.0	14.0	18.0	50	76.25	0.0	0.0	70	18.5
41490	1300	12.0	12.0	20.0	40	76.10	0.0	0.0	290	18.5
41590	1740	13.0	14.0	17.0	60	75.92	0.0	0.0	350	11.1
41690	1305	14.0	12.0	8.0	65	76.17	0.0	0.0	20	29.6
41790	1545	11.0	11.0	7.0	70	76.07	0.1	0.0	320	18.5
41890	1455	12.0	14.0	18.0	45	75.82	0.0	0.0	60	14.8
41990	1450	12.0	14.0	18.0	50	75.87	0.0	0.0	310	37.0
42090	1545	13.0	15.0	20.0	50	76.35	0.0	0.0	50	7.4
42190	1250	14.0	14.0	21.0	50	76.25	0.0	0.0	0	0.0
42290	1405	14.0	14.0	20.0	45	75.67	0.0	0.0	240	33.3

Table 3. Concentrations of Gases at 2.0 and 1.2 m Depths

Date	N2-2m	O2-2m	CO2-2m	He-2m	N2-1.2m	O2-1.2m	CO2-1.2m	He-1.2m
53089	91.3	60.1	0.69	5440	72.2	14.9	0.09	5440
53189	75.3	14.6	0.18	5440	65.4	12.6	0.11	5266
60189	74.4	13.8	0.10	4918	67.6	12.0	0.08	5150
60289	69.2	14.2	0.11	4940	69.1	14.1	0.10	5440
60389	68.3	13.6	0.11	4744	73.0	15.2	0.10	5498
60489	75.7	15.8	0.15	5382	69.2	13.6	0.12	5208
60589	69.2	12.8	0.06	5266	72.7	14.0	0.15	5382
60689	67.8	12.9	0.10	5034	75.2	15.6	0.07	5382
60789	74.5	14.9	0.10	4918	74.5	15.3	0.09	5440
60889	68.5	13.4	0.10	5150	66.8	12.2	0.10	5150
60989	67.0	12.6	0.10	4784	63.7	10.7	0.10	5096
61089	68.3	13.0	0.08	4836	74.8	15.2	0.11	5304
61189	68.9	13.5	0.09	5356	70.6	13.5	0.11	5408
61289	72.8	14.7	0.11	5408	71.5	14.0	0.10	5252
61389	76.7	15.7	0.11	4472	71.9	14.1	0.11	5044
61489	76.1	15.8	0.11	4576	67.4	13.0	0.09	5304
61589	73.7	14.9	0.12	5096	61.2	6.7	0.10	5356
61689	74.7	15.5	0.12	5148	70.5	14.4	0.10	5304
61789	72.9	15.2	0.10	5356	76.4	16.2	0.12	4836
61889	74.3	15.6	0.10	5096	68.6	13.8	0.10	4888
61989	67.2	16.3	0.69	5460	68.3	15.5	0.10	4940
62089	68.5	17.4	0.12	5252	63.1	18.9	0.07	5408
62189	64.5	15.8	0.10	4784	76.3	23.3	0.17	5356
62289	70.0	16.6	0.47	5044	65.2	21.5	0.19	5252
62389	70.4	20.0	0.03	5768	67.3	21.8	0.08	5768
62489	69.5	20.7	0.03	5768	69.7	21.9	0.07	5768
62489	68.6	21.6	0.14	5352	68.5	22.2	0.20	5768
62489	68.0	21.5	0.03	5300	73.2	22.9	0.14	5716
62489	62.3	13.6	0.13	5872	68.7	22.4	0.14	5664
62489	71.4	17.0	0.08	5872	62.2	21.0	0.09	5716
62589	74.7	17.7	0.01	5872	70.0	16.0	0.10	5456
62589	71.8	15.6	0.08	5768	69.3	15.8	0.01	5300
62589	75.0	21.4	0.11	5820	67.2	16.0	0.13	5716
62589	69.0	18.0	0.05	5456	64.6	14.5	0.08	5300
62589	60.6	15.3	0.06	5872	77.9	21.2	0.02	5560
62689	64.6	17.9	0.07	5352	72.9	23.9	0.20	5248
62789	68.5	17.8	0.13	5456	71.5	22.6	0.03	5352
62889	61.7	19.2	0.12	5456	61.9	19.9	0.13	5196
62989	71.6	20.3	0.21	5248	64.5	19.6	0.22	5196
63089	63.0	19.5	0.18	5300	68.0	20.4	0.14	5508
70189	64.8	19.7	0.13	5352	67.0	20.4	0.15	5404
70189	64.7	19.6	0.17	5456	68.3	20.1	0.24	5196
70189	67.2	20.1	0.12	5144	67.5	20.4	0.17	5248
70189	60.5	19.1	0.18	5144	69.9	17.9	0.34	5404
70189	60.3	19.3	0.16	5300	70.5	20.9	0.23	4832
70289	67.0	19.9	0.17	5092	73.1	20.9	0.19	4936
70289	75.1	20.9	0.20	5456	71.9	20.5	0.16	5404
70289	61.6	19.5	0.14	5352	64.8	19.9	0.24	5508
70289	66.2	20.2	0.15	5092	52.5	18.5	0.22	5300
70389	77.4	14.4	0.04	5300	68.4	14.1	0.22	5144
70489	79.1	16.0	0.53	5456	65.1	12.7	0.13	5456

Table 3. Concentrations of Gases at 2.0 and 1.2 m Depths

Date	N2-2m	O2-2m	CO2-2m	He-2m	N2-1.2m	O2-1.2m	CO2-1.2m	He-1.2m
70589	70.7	19.5	0.05	5820	65.7	19.4	0.14	5404
70689	64.7	19.1	0.21	5074	71.2	20.0	0.16	5120
70789	67.2	19.8	0.19	5304	67.3	19.6	0.17	4982
70789	64.2	19.5	0.18	5258	71.0	20.1	0.14	4844
70889	75.0	19.9	0.18	5212	73.9	20.4	0.16	4936
70889	66.5	19.9	0.18	5120	61.5	19.1	0.13	5258
70889	74.9	20.6	0.23	4936	65.7	19.5	0.16	5258
70889	67.1	20.0	0.18	4982	68.4	19.8	0.15	5350
70889	68.0	20.1	0.17	5258	60.3	18.9	0.13	5350
70889	68.5	20.0	0.18	5212	63.6	19.2	0.14	5212
70889	62.7	19.4	0.14	5120	61.5	19.1	0.13	4936
70889	66.1	19.7	0.14	4798	64.4	19.3	0.14	5258
70989	66.2	19.7	0.15	5350	66.2	19.6	0.13	5166
70989	95.0	22.4	0.09	4936	67.9	19.7	0.13	5350
70989	63.9	19.4	0.14	5028	61.7	19.1	0.11	5074
70989	53.6	18.2	0.11	5350	61.3	18.9	0.12	5258
70989	67.0	19.8	0.13	5350	60.9	19.0	0.12	4982
70989	69.4	20.0	0.13	5258	65.8	19.5	0.11	5304
70989	65.3	19.5	0.13	5258	67.8	19.7	0.13	5258
71089	66.7	20.2	0.17	5120	71.8	20.7	0.21	5166
71189	79.3	18.1	0.04	4890	66.0	19.0	0.06	5304
71289	63.8	18.8	0.05	4676	64.3	18.9	0.06	4936
71389	61.0	18.7	0.05	5040	64.7	19.1	0.06	5092
71489	65.7	18.7	0.07	5144	60.0	18.2	0.07	5144
71589	68.2	18.8	0.09	5404	68.4	18.9	0.09	5092
71689	61.3	18.3	0.06	5508	67.6	19.0	0.07	5404
72389	67.8	19.0	0.09	5404	64.2	18.7	0.08	5612
72489	75.6	19.7	0.11	5404	66.9	18.9	0.12	5040
72589	69.1	19.1	0.09	5560	69.7	19.2	0.13	5300
72589	70.0	19.1	0.11	5352	72.1	19.5	0.11	5404
72689	66.7	18.9	0.09	5456	62.9	18.5	0.10	5456
72789	68.4	19.1	0.11	5404	69.0	19.2	0.11	5196
72889	63.3	18.6	0.11	5248	67.3	19.1	0.11	5092
72989	70.0	19.2	0.10	5144	73.0	19.6	0.13	5404
72989	63.2	18.7	0.08	5352	67.9	19.1	0.13	5040
73089	68.0	19.1	0.10	5456	71.5	19.6	0.12	5508
73189	75.2	18.0	0.13	5196	69.1	17.5	0.20	5040
80189	66.5	17.6	0.10	5144	70.1	17.9	0.14	5404
80289	68.2	17.7	0.12	5352	70.6	17.5	0.20	5456
80389	70.6	17.9	0.14	5092	65.6	17.3	0.15	5404
80489	66.6	17.5	0.13	5092	67.4	17.4	0.16	5456
80589	73.3	18.1	0.14	5456	70.2	17.8	0.17	5196
80689	70.5	17.9	0.13	5456	63.9	17.2	0.16	5300
80789	72.2	18.1	0.14	5092	77.6	18.4	0.22	5092
80889	72.3	18.0	0.15	5508	69.8	17.7	0.19	5352
80989	67.7	17.7	0.12	5248	66.7	17.5	0.17	5456
81089	65.7	17.3	0.15	5144	67.4	17.6	0.20	5300
81189	73.2	18.1	0.16	5300	71.8	18.1	0.23	5196
81289	67.2	17.6	0.15	5404	75.0	18.4	0.21	5144
81389	68.0	17.7	0.16	5248	73.8	18.1	0.24	5612
81489	74.4	18.2	0.21	5092	62.2	17.0	0.18	5456

Table 3. Concentrations of Gases at 2.0 and 1.2 m Depths

Date	N2-2m	O2-2m	CO2-2m	He-2m	N2-1.2m	O2-1.2m	CO2-1.2m	He-1.2m
81589	70.9	17.8	0.21	5456	66.2	17.4	0.21	5144
81689	77.4	18.4	0.21	5300	72.3	18.0	0.25	5456
81789	65.6	17.4	0.17	5456	60.8	16.8	0.21	5144
81889	64.5	17.2	0.19	5612	71.6	17.9	0.25	5404
81989	66.2	17.5	0.20	5144	64.9	17.3	0.21	5456
82089	72.9	17.9	0.25	5456	60.1	16.8	0.23	5248
82189	67.7	17.6	0.21	5352	71.8	17.9	0.33	5508
82289	69.1	17.5	0.25	5560	54.6	17.7	0.21	5456
82389	68.1	17.4	0.26	5404	62.7	17.1	0.23	5560
82489	68.8	17.4	0.25	5456	70.8	17.9	0.33	5716
82589	70.3	18.0	0.18	5352	70.0	17.7	0.25	5300
82689	69.2	17.7	0.26	5664	64.1	17.1	0.19	5612
82789	62.5	16.9	0.17	5508	73.0	18.0	0.25	5768
82889	62.9	17.1	0.18	5664	69.8	17.8	0.23	5716
82989	56.9	16.3	0.17	5352	66.5	17.4	0.22	5248
83089	65.9	17.3	0.19	5612	72.7	18.2	0.31	5820
83189	67.4	16.4	0.28	5352	64.1	16.8	0.19	5404
90589	59.1	16.3	0.14	5404	58.8	10.7	0.06	5612
90689	64.6	17.0	0.26	5560	62.7	10.7	0.06	5560
90789	62.7	16.7	0.36	5560	62.0	16.4	0.24	5664
90889	55.7	15.9	0.15	5442	57.7	11.1	0.12	5442
90989	61.0	16.3	0.27	5212	57.0	11.9	0.15	5028
91089	60.7	16.6	0.13	5074	70.8	12.6	0.20	5304
91189	73.6	17.4	0.43	5258	73.8	18.0	0.27	5166
91289	72.4	15.1	0.09	5396	68.7	17.4	0.28	5810
91389	77.8	18.4	0.23	5534	77.1	18.3	0.25	5212
91489	69.6	12.0	0.18	5166	74.3	17.9	0.39	5488
91589	65.9	17.5	0.17	4982	68.0	17.4	0.19	5304
91689	64.2	17.1	0.22	5304	64.1	17.0	0.21	5488
91789	68.4	17.6	0.21	5350	66.2	17.3	0.18	5074
91889	59.1	16.5	0.23	5028	59.2	16.7	0.17	5166
91989	57.0	16.4	0.18	5166	65.3	17.4	0.20	5120
92089	62.8	17.1	0.16	5212	66.8	17.4	0.20	5304
92189	71.7	17.8	0.25	5258	74.2	18.0	0.24	5350
92289	69.4	17.5	0.23	5442	72.3	17.8	0.26	5074
92289	79.6	18.4	0.29	5580	72.1	17.9	0.23	5396
92289	85.9	19.1	0.26	5396	77.8	18.4	0.25	5258
92289	B	B	B	5258	78.1	18.4	0.27	5626
92289	74.9	18.0	0.32	5120	74.3	18.1	0.27	5166
92289	74.4	17.8	0.33	5212	79.7	18.6	0.28	5350
92289	75.4	18.1	0.25	5442	73.3	18.1	0.27	5396
92289	72.5	17.8	0.26	5580	73.4	18.0	0.25	5222
92289	73.8	18.1	0.22	5442	69.0	17.6	0.25	5350
92289	75.1	18.1	0.26	5304	74.2	18.0	0.28	5580
92289	71.4	17.7	0.23	5442	79.2	18.5	0.30	5258
92289	70.6	17.6	0.25	5442	B	B	B	5580
92289	79.0	18.4	0.27	5580	72.5	17.9	0.26	5580
92289	73.8	18.0	0.25	5396	73.7	18.1	0.23	5222
92289	71.4	17.8	0.26	5120	73.2	17.9	0.27	5396
92289	67.9	17.5	0.23	5350	75.5	18.2	0.25	5120
92389	72.8	18.0	0.23	5258	70.4	17.6	0.24	5534

Table 3. Concentrations of Gases at 2.0 and 1.2 m Depths

Date	N2-2m	O2-2m	CO2-2m	He-2m	N2-1.2m	O2-1.2m	CO2-1.2m	He-1.2m
92489	68.7	17.6	0.22	5442	78.1	18.4	0.28	5396
92589	49.9	16.0	0.15	4872	85.2	19.1	0.11	4872
92689	65.9	17.7	0.24	4964	68.9	18.0	0.26	4872
92789	60.5	17.0	0.20	5102	81.2	19.1	0.27	5194
92889	64.7	17.4	0.26	5240	51.8	16.2	0.16	5010
92989	68.0	17.7	0.30	5378	77.5	18.9	0.26	5286
93089	74.4	18.4	0.30	5240	74.2	18.4	0.25	4964
101689	71.2	18.3	0.27	5378	70.8	18.5	0.23	5286
101789	63.8	16.9	0.22	4780	59.0	15.5	0.03	5056
101889	56.9	14.3	0.02	5286	68.7	18.5	0.10	5286
101989	81.3	19.1	0.21	5194	73.6	19.4	0.17	5194
102089	62.9	15.0	0.19	5424	76.7	20.5	0.21	5148
102189	70.9	19.8	0.22	5240	79.5	20.5	0.22	5378
102289	60.6	18.6	0.13	5332	76.5	20.3	0.17	5332
102389	73.3	16.9	0.40	5424	69.5	16.4	0.04	5010
102489	71.1	19.1	0.19	4596	73.2	21.2	0.09	5240
102589	71.3	21.5	0.11	5010	62.1	17.5	0.20	4826
102689	70.6	19.2	0.20	4964	65.7	18.1	0.01	5010
102789	60.5	20.4	0.04	4780	74.2	21.8	0.12	4872
102889	63.5	20.0	0.10	4826	61.3	20.5	0.08	5148
102989	57.8	19.6	0.14	5056	87.5	21.7	0.10	5056
103089	79.3	21.3	0.16	5148	70.0	21.0	0.09	5148
103189	68.1	18.6	0.13	4918	63.3	18.4	0.08	4964
110189	75.0	19.4	0.13	5148	71.8	19.2	0.07	5056
110289	80.5	19.9	0.16	4826	70.6	19.0	0.08	5102
110389	70.6	19.0	0.11	5194	74.5	19.6	0.11	5286
110489	71.6	19.6	0.11	5470	67.3	19.5	0.06	5194
110589	69.7	19.6	0.10	5332	75.3	20.1	0.06	5516
110689	63.5	19.4	0.02	5378	75.6	18.3	0.10	5286
110789	77.9	21.4	0.09	5102	82.7	22.5	.00	5056
110889	77.4	21.8	0.01	5378	80.9	21.8	0.02	5240
110989	77.5	17.4	.00	5130	78.1	21.5	.00	5442
111089	60.8	19.8	.00	5026	74.7	20.9	0.01	5754
111189	79.2	22.2	0.04	5598	77.9	21.0	.00	4974
111289	77.3	21.3	0.10	5702	62.8	20.4	0.02	5598
111389	71.5	20.6	0.06	5702	69.7	20.5	0.04	5286
111489	77.9	20.8	0.06	5754	79.8	21.2	0.03	5702
111589	71.9	20.2	0.08	5132	79.3	20.6	0.02	5132
111689	73.9	20.3	0.06	5496	71.2	20.4	0.06	5028
111789	69.5	18.4	0.06	5028	78.3	19.3	0.05	5444
111889	80.6	19.1	0.07	5132	75.0	19.1	0.04	5548
111989	81.1	19.7	0.07	5340	72.2	18.9	0.04	5600
112089	75.9	19.1	0.09	5598	69.9	18.6	0.05	5286
112189	80.9	19.3	0.14	5756	63.3	17.9	0.05	5860
112289	75.9	19.4	0.09	5756	73.4	19.6	0.04	5756
112389	69.7	18.8	0.09	6068	54.5	17.8	0.03	5808
112489	68.4	19.6	0.07	5704	73.8	20.2	0.05	5444
112589	71.8	19.8	0.07	5600	74.3	20.4	0.04	5548
112689	65.1	19.0	0.07	5912	73.0	20.1	0.05	5340
112789	66.2	19.0	0.08	5600	74.7	20.3	0.05	5600
112889	74.1	20.0	0.08	5600	67.2	19.5	0.04	5704

Table 3. Concentrations of Gases at 2.0 and 1.2 m Depths

Date	N2-2m	O2-2m	CO2-2m	He-2m	N2-1.2m	O2-1.2m	CO2-1.2m	He-1.2m
112989	80.4	19.5	0.01	5612	79.5	16.3	0.03	5612
113089	77.9	18.3	0.02	5570	71.9	19.3	0.02	5360
120189	71.9	18.8	0.02	5864	81.1	20.6	0.03	5528
120289	71.5	14.7	0.01	5486	85.1	20.4	0.02	5780
120389	79.8	19.3	0.36	5654	100.0	23.6	.00	5822
120489	44.4	17.3	0.04	5738	56.8	18.5	0.07	5318
120589	42.9	17.5	0.02	5864	54.4	18.4	0.04	5570
120689	52.4	18.1	0.02	5570	59.6	19.2	0.02	5822
120789	55.1	19.0	0.02	5444	49.0	17.8	0.03	5528
120889	59.7	18.6	0.07	5780	65.7	19.5	0.04	5528
120989	68.9	19.5	0.04	5360	64.4	21.6	0.00	5822
121089	77.1	20.8	0.05	5360	69.3	20.0	0.03	5696
121189	67.3	19.3	0.06	5990	70.8	19.5	0.05	5780
121289	56.5	11.7	0.01	5330	75.1	18.0	0.01	5790
121389	71.2	19.2	0.05	5882	70.6	19.4	0.01	5836
121489	72.7	19.5	0.01	5812	73.1	22.0	0.00	5232
121589	B	B	B	5348	75.5	20.5	0.03	5872
121689	67.4	19.0	0.03	5112	72.5	20.0	0.01	5696
121789	B	B	B	5290	73.7	20.0	0.04	5348
121889	67.2	18.9	0.04	5406	76.0	20.0	0.04	5522
121989	77.4	20.0	0.06	5754	72.3	19.7	0.03	5348
122089	64.3	18.8	0.03	5638	73.2	19.8	0.04	5580
122189	68.0	19.3	0.03	5638	81.1	20.6	0.01	5522
122289	79.5	20.7	0.07	5638	76.0	20.6	0.03	5580
122389	79.5	20.9	0.05	5406	65.9	21.6	0.00	5754
122489	74.0	20.4	0.04	5580	73.8	20.5	0.02	5696
122589	69.1	19.7	0.04	5406	70.8	20.2	0.03	5580
122689	69.6	19.8	0.06	5406	55.4	20.1	0.00	5812
122789	67.5	20.9	0.00	5192	76.3	21.9	0.00	5250
122889	80.5	20.1	0.03	5018	70.2	21.1	0.00	5250
122989	67.4	21.0	0.00	5148	63.7	20.5	0.00	5096
123089	63.1	20.5	0.00	5200	83.7	22.5	0.00	5252
123189	72.3	21.5	0.00	5200	67.9	21.0	0.00	5148
10190	69.7	21.1	0.00	5200	65.1	20.6	0.00	5252
10290	77.0	19.2	0.03	5252	83.8	21.9	0.00	5148
10390	66.8	20.4	0.00	5252	79.3	21.5	0.00	5408
10490	82.4	19.5	0.04	5408	66.6	20.2	0.00	5252
10590	62.3	20.1	0.00	5184	56.3	19.4	0.00	5138
10690	70.6	18.8	0.03	5184	59.7	19.8	0.00	5138
10790	80.1	19.6	0.03	5138	63.6	20.1	0.00	5138
10890	66.8	18.6	0.01	5000	82.7	21.7	0.00	5092
11990	66.0	20.1	0.00	5184	75.0	20.9	0.00	4954
12090	60.6	19.8	0.00	5276	68.2	20.5	0.00	5092
12190	57.7	17.4	0.00	4954	64.5	20.1	0.00	5184
12290	70.4	18.4	0.02	5276	74.7	20.8	0.00	5184
12390	74.4	22.0	0.00	5276	69.3	21.5	0.00	5184
12490	71.5	18.1	0.00	5184	84.3	22.8	0.00	5230
12590	78.7	22.3	0.00	5138	76.4	22.1	0.00	5092
12690	69.0	21.7	0.00	5138	75.3	22.1	0.00	5276
12790	50.1	19.5	0.00	5138	75.7	22.1	0.00	5184
12890	67.4	21.4	0.00	5138	B	B	B	5046

Table 3. Concentrations of Gases at 2.0 and 1.2 m Depths

Date	N2-2m	O2-2m	CO2-2m	He-2m	N2-1.2m	O2-1.2m	CO2-1.2m	He-1.2m
12990	84.5	19.9	0.01	5092	80.1	22.1	0.00	4954
13090	84.0	20.4	0.02	5276	75.6	21.8	0.00	5138
13190	78.8	20.3	0.01	5276	66.4	20.7	0.00	5276
20190	84.3	22.5	0.00	5000	71.1	21.1	0.00	5276
20290	91.6	20.9	0.03	5276	78.3	21.9	0.00	5046
20390	63.8	20.9	0.00	5322	70.8	21.6	0.00	5184
20490	65.9	21.1	0.00	5092	52.2	19.6	0.00	5368
20590	55.5	20.0	0.00	5092	48.0	19.3	0.00	5276
20690	58.9	20.4	0.00	5138	74.5	21.9	0.00	5184
20790	77.4	22.2	0.00	5368	67.4	21.2	0.00	5368
20890	62.9	20.2	0.00	5414	81.8	13.3	0.00	5138
20990	62.5	20.1	0.00	5414	70.6	20.9	0.00	5414
21090	79.7	21.8	0.00	5046	67.4	20.7	0.00	5276
21190	71.6	21.1	0.00	5184	56.5	19.7	0.00	5322
21290	58.6	19.9	0.00	5368	77.1	21.4	0.00	5414
21390	58.4	19.8	0.00	5322	67.8	20.6	0.00	5322
21490	82.7	22.1	0.00	5414	76.0	21.4	0.00	5414
21590	54.1	19.5	0.00	5414	76.5	21.6	0.00	5414
21690	69.3	20.9	0.00	5138	55.7	19.7	0.00	5184
21790	63.4	20.9	0.00	5368	44.6	19.7	0.00	5322
21890	52.7	20.2	0.00	5368	55.2	20.7	0.00	5368
21990	52.2	20.3	0.00	5276	44.7	19.6	0.00	5184
22090	70.3	19.8	0.00	5184	62.8	21.4	0.00	5184
22190	70.1	22.0	0.00	5368	64.8	21.6	0.00	5046
22290	59.5	21.0	0.00	5368	51.4	20.2	0.00	5414
22390	48.1	20.0	0.00	5276	51.5	20.3	0.00	5230
22490	42.2	19.3	0.00	5276	57.1	20.8	0.00	5138
22590	41.5	19.8	0.00	5276	54.9	20.7	0.00	5368
22690	59.3	21.1	0.00	5368	58.2	21.0	0.00	5230
22790	66.3	21.7	0.00	5230	51.5	20.3	0.00	5414
22890	58.1	15.5	0.02	5414	51.0	13.6	0.01	5368
30190	52.5	14.0	0.04	5460	60.8	16.2	0.03	5276
30290	64.1	17.0	0.04	5414	63.0	16.7	0.03	5506
30390	72.5	19.3	0.04	5276	61.4	16.3	0.03	5230
30490	B	B	B	5552	53.3	14.2	0.03	5276
30590	51.4	13.7	0.03	5460	51.6	14.0	0.03	5276
30690	52.8	14.1	0.03	5276	56.7	15.1	0.03	5368
30790	48.5	12.9	0.01	5414	58.2	15.5	0.03	5322
30890	54.8	14.6	0.03	5460	50.5	13.5	0.04	5184
30990	68.3	18.1	0.04	5552	64.8	17.1	0.04	5138
31090	64.0	16.9	0.03	5506	63.7	16.8	0.03	5184
31190	64.4	17.0	0.03	5552	76.1	19.9	0.04	5414
31290	47.2	12.6	0.02	5184	47.7	12.6	0.01	5414
31390	48.2	12.8	0.03	5276	56.6	14.9	0.02	5322
31490	50.7	13.5	0.03	5368	53.7	14.4	0.03	5322
31590	49.3	13.2	0.03	5368	46.8	12.5	0.02	5322
31690	78.5	20.1	0.04	5414	53.9	14.4	0.03	5368
31790	56.6	15.0	0.03	5506	64.4	16.9	0.04	5322
31890	56.2	14.9	0.03	5276	47.0	12.5	0.03	5138
31990	50.3	13.4	0.03	5322	50.7	13.4	0.03	5184
32090	35.9	9.6	0.03	5276	62.2	16.3	0.03	5230

Table 3. Concentrations of Gases at 2.0 and 1.2 m Depths

Date	N2-2m	O2-2m	CO2-2m	He-2m	N2-1.2m	O2-1.2m	CO2-1.2m	He-1.2m
32190	40.0	10.7	0.03	5230	48.0	12.8	0.02	5230
32290	67.1	17.5	0.04	5398	66.4	17.4	0.04	5230
32390	78.8	20.3	0.04	5398	73.0	19.0	0.03	5272
32490	55.1	14.5	0.04	5398	75.0	19.5	0.03	5188
32590	45.2	12.1	0.03	5356	64.4	16.9	0.04	5230
32690	B	B	B	5356	51.6	13.7	0.03	5230
32790	50.4	13.4	0.03	5398	74.6	19.4	0.04	5356
32890	52.6	13.9	0.04	5272	60.6	16.0	0.04	5146
32990	B	B	B	5314	57.9	15.3	0.03	5356
33090	72.5	18.8	0.04	5356	75.4	19.6	0.04	5356
33190	B	B	B	5482	80.0	20.8	0.05	5356
40190	47.9	12.4	0.02	5314	57.5	15.0	0.03	5104
40290	79.3	20.5	0.04	5272	76.6	19.8	0.05	5440
40390	53.8	14.0	0.04	5398	66.3	17.3	0.04	5440
40490	59.6	15.5	0.04	5398	62.3	16.2	0.04	5398
40590	73.5	19.0	0.04	5356	83.1	21.5	0.04	5524
40690	48.9	12.9	0.03	5184	55.5	14.5	0.04	5414
40790	74.0	19.2	0.03	5276	74.7	19.4	0.04	5552
40890	59.6	15.5	0.04	5184	49.2	12.9	0.04	5460
40990	100.0	28.6	0.05	5368	58.1	15.3	0.03	5460
41090	82.0	21.4	0.04	5460	54.4	14.4	0.04	5322
41190	78.3	20.3	0.05	5414	57.3	15.0	0.03	5322
41290	55.3	14.6	0.04	5368	53.6	14.2	0.04	5230
41390	46.4	12.4	0.03	5460	53.8	14.3	0.04	5184
41490	72.0	18.9	0.04	5598	69.7	18.2	0.05	5276
41590	58.8	15.5	0.03	5368	60.9	16.1	0.04	5414
41690	81.9	21.1	0.03	5322	99.7	25.8	0.05	5506
41790	56.3	15.0	0.04	5276	88.0	23.7	0.05	5184
41890	88.1	22.3	0.05	5446	85.8	21.7	0.05	5400
41990	55.6	14.3	0.04	5446	85.1	21.6	0.05	5446
42090	59.3	15.1	0.04	5446	58.9	15.1	0.04	5446
42190	63.7	16.3	0.02	5446	84.3	21.3	0.05	5492
42290	64.6	16.5	0.04	5446	56.7	14.5	0.04	5446

Table 4. Concentrations of Gases at 0.6 and 0.3 m Depths

Date	N2-0.6m	O2-0.6m	CO2-0.6m	He-0.6m	N2-0.3m	O2-0.3m	CO2-0.3m	He-0.3m
53089	66.3	13.1	0.09	5614	68.9	13.5	0.14	5034
53189	73.4	15.6	0.09	4280	66.0	12.6	0.10	5092
60189	63.3	10.5	0.05	5672	64.7	10.5	0.05	5440
60289	69.2	14.2	0.08	5034	70.3	14.5	0.09	5440
60389	70.6	14.4	0.10	4860	73.6	13.8	0.12	4976
60489	70.8	13.8	0.09	5440	76.8	15.8	0.17	5440
60589	64.8	12.2	0.09	5440	68.7	13.6	0.12	5150
60689	68.3	9.6	0.05	5208	67.8	13.4	0.13	5440
60789	62.0	11.5	0.09	4976	65.4	12.9	0.06	5382
60889	75.2	15.4	0.11	5150	75.4	17.0	0.09	5440
60989	60.5	10.1	0.10	4888	63.3	11.5	0.09	4888
61089	67.0	12.6	0.10	5356	73.1	14.9	0.10	5304
61189	72.0	14.1	0.11	5304	75.6	15.7	0.11	5252
61289	77.5	14.8	0.13	5304	72.0	15.0	0.12	4732
61389	66.2	12.2	0.11	4940	84.3	18.6	0.12	5148
61489	75.5	16.2	0.12	4940	71.5	14.9	0.11	5148
61589	69.5	14.1	0.12	5408	70.0	14.4	0.11	5200
61689	63.6	12.3	0.11	5148	67.6	13.7	0.11	4784
61789	66.0	13.3	0.10	5356	72.1	15.5	0.10	5356
61889	69.8	14.2	0.11	5408	65.7	13.5	0.10	4732
61989	67.5	22.1	0.07	5200	70.5	22.9	0.05	5200
62089	63.9	19.2	0.05	5252	71.8	23.3	0.08	5200
62189	63.3	20.8	0.01	5356	73.1	23.5	0.08	4836
62289	64.6	22.2	0.09	5200	69.3	22.4	0.16	4992
62389	69.1	22.0	0.03	5196	70.5	23.0	0.06	5404
62489	68.4	15.5	0.14	5612	77.0	23.4	0.35	5560
62489	70.9	17.4	0.22	5612	68.8	22.4	0.03	5404
62489	77.3	23.8	0.07	5820	69.8	22.3	0.09	5248
62489	73.3	22.6	0.17	5456	71.3	21.7	0.06	5092
62489	64.4	21.8	0.12	5508	75.1	23.8	0.05	5300
62589	74.9	23.1	0.36	5664	69.7	22.8	0.13	5508
62589	70.0	23.4	0.03	5664	74.4	23.3	0.09	5300
62589	66.6	19.4	0.05	5768	70.6	22.8	0.13	5248
62589	69.5	22.8	0.05	5300	70.8	20.6	0.04	5300
62589	63.7	21.2	0.06	5716	68.6	22.7	0.05	5508
62689	72.7	21.6	0.12	5248	72.1	22.5	0.20	4884
62789	71.0	22.7	0.05	4884	70.7	22.0	0.06	4988
62889	62.9	13.9	0.29	5508	60.7	14.7	0.15	5248
62989	67.4	20.5	0.16	5404	63.9	13.9	0.20	5144
63089	62.4	19.5	0.31	4988	63.4	14.8	0.05	5364
70189	68.3	20.4	0.12	5352	65.7	13.9	0.06	5538
70189	65.3	19.9	0.25	5352	69.2	13.4	0.09	5480
70189	B	23.0	0.24	B	68.3	13.6	0.18	5132
70189	67.5	20.3	0.21	5378	74.8	17.0	0.13	5480
70189	68.7	20.7	0.19	5016	69.3	13.6	0.15	4958
70289	67.5	20.5	0.17	5132	66.2	16.9	0.16	5538
70289	67.4	14.5	0.05	5480	66.4	13.6	0.16	5190
70289	77.8	14.6	0.41	5248	71.0	16.2	0.04	5364
70289	60.0	12.1	0.14	5040	69.0	14.2	0.59	5190
70389	62.9	13.2	0.24	5480	72.6	14.7	0.26	5364
70489	68.3	12.9	0.45	5248	51.6	10.4	0.02	5248

Table 4. Concentrations of Gases at 0.6 and 0.3 m Depths

Date	N2-0.6m	O2-0.6m	CO2-0.6m	He-0.6m	N2-0.3m	O2-0.3m	CO2-0.3m	He-0.3m
70589	70.9	20.0	0.11	5364	64.0	19.4	0.12	5132
70689	65.0	19.2	0.11	5304	65.3	19.6	0.11	4982
70789	63.0	19.1	0.10	5074	65.8	19.6	0.14	5120
70789	64.6	19.4	0.11	5212	67.8	20.0	0.10	5258
70889	67.3	19.7	0.11	5212	68.5	20.2	0.12	5258
70889	59.4	18.8	0.11	5120	68.4	20.2	0.15	5120
70889	64.0	19.3	0.12	5258	67.1	20.2	0.13	5258
70889	71.1	20.0	0.12	4844	71.3	20.5	0.13	5212
70889	68.8	19.9	0.12	4982	63.9	20.0	0.09	4982
70889	69.5	19.9	0.12	5074	70.8	20.8	0.13	4798
70889	52.9	18.1	0.09	4936	65.1	20.2	0.14	5212
70889	70.4	20.1	0.11	5074	62.9	20.0	0.11	5258
70989	61.6	19.6	0.11	4890	69.7	20.6	0.13	5212
70989	64.3	19.4	0.11	5258	60.3	19.5	0.13	5074
70989	62.7	19.3	0.11	4844	65.3	20.3	0.13	4982
70989	66.9	19.7	0.13	4936	65.5	20.4	0.13	5212
70989	58.0	18.8	0.11	4798	57.5	19.3	0.11	4936
70989	61.2	18.7	0.14	5258	68.5	20.6	0.12	5304
70989	64.6	19.5	0.12	5212	71.5	21.0	0.10	5166
71089	66.4	19.8	0.12	5304	71.0	20.9	0.14	4936
71189	65.4	19.1	0.04	5166	68.1	19.5	0.04	5028
71289	62.7	18.8	0.04	5040	62.3	18.9	0.04	4936
71389	65.7	19.3	0.05	4728	64.3	19.4	0.03	5092
71489	60.7	18.3	0.06	5144	66.6	19.3	0.04	5196
71589	68.3	19.3	0.07	5508	69.4	19.5	0.05	5404
71689	64.2	18.8	0.06	5404	65.1	19.2	0.04	5248
72389	62.2	18.6	0.06	5300	61.2	18.9	0.03	5092
72489	65.7	19.1	0.09	5404	69.9	19.8	0.06	5092
72589	67.9	19.2	0.10	5508	70.2	19.5	0.08	5248
72589	75.9	20.1	0.10	5456	75.9	20.5	0.06	5300
72689	74.3	19.9	0.09	5404	72.6	20.1	0.06	5144
72789	69.7	19.6	0.08	5196	77.0	20.7	0.06	5040
72889	66.2	19.3	0.08	5144	68.0	19.6	0.06	5456
72989	72.2	19.9	0.10	5144	69.2	19.9	0.05	5248
72989	67.5	19.4	0.09	5300	66.2	19.5	0.05	5456
73089	73.7	20.0	0.10	5404	70.2	19.2	0.09	5508
73189	68.9	17.8	0.09	5144	67.0	18.0	0.06	5144
80189	64.9	17.4	0.10	5300	68.7	18.0	0.07	5456
80289	70.7	18.0	0.14	5508	71.5	18.3	0.08	5612
80389	60.8	17.1	0.11	5196	64.9	17.7	0.06	5040
80489	60.9	17.2	0.08	5248	65.4	17.7	0.06	5717
80589	77.0	18.6	0.14	4936	67.4	17.9	0.08	5422
80689	63.7	17.5	0.12	5364	60.8	17.5	0.06	5480
80789	63.4	17.4	0.09	5190	66.3	17.9	0.09	5712
80889	69.0	18.0	0.14	5654	76.4	18.8	0.10	5248
80989	66.6	17.5	0.14	5596	77.5	18.9	0.12	5712
81089	68.7	17.8	0.12	5480	68.4	18.3	0.05	5196
81189	68.0	17.8	0.13	5654	62.3	17.4	0.06	5248
81289	71.9	18.1	0.13	5538	67.1	18.1	0.07	5404
81389	67.2	18.0	0.13	5712	72.0	18.6	0.07	5196
81489	62.6	17.2	0.12	5538	70.2	18.4	0.10	5456

Table 4. Concentrations of Gases at 0.6 and 0.3 m Depths

Date	N2-0.6m	O2-0.6m	CO2-0.6m	He-0.6m	N2-0.3m	O2-0.3m	CO2-0.3m	He-0.3m
81589	63.1	17.4	0.10	5364	66.8	17.9	0.09	5404
81689	61.8	17.1	0.13	5596	66.0	17.5	0.10	5248
81789	58.8	17.0	0.12	5480	56.3	16.7	0.05	5300
81889	70.4	18.1	0.15	5596	61.0	16.9	0.07	5456
81989	60.6	17.1	0.14	5596	73.2	19.0	0.04	5456
82089	66.6	17.7	0.15	5306	67.5	18.0	0.11	5508
82189	77.3	18.9	0.20	5422	65.4	17.6	0.08	5508
82289	67.1	17.5	0.17	5538	67.8	18.1	0.10	5508
82389	73.5	18.1	0.23	5560	70.2	18.3	0.10	5508
82489	60.5	16.9	0.15	5560	67.1	18.1	0.06	5508
82589	65.7	17.6	0.18	5196	62.0	17.0	0.06	5664
82689	65.7	17.5	0.13	4780	63.9	17.2	0.07	5664
82789	61.8	17.2	0.11	5768	70.1	18.2	0.08	5664
82889	66.2	17.4	0.15	5300	74.4	18.7	0.07	5768
82989	65.8	17.4	0.13	5456	70.1	17.9	0.07	5508
83089	57.9	16.7	0.11	5612	60.0	17.2	0.06	5560
83189	65.0	16.5	0.09	5560	65.0	17.1	0.04	5768
90589	60.9	11.6	0.07	5560	63.7	17.3	0.12	5196
90689	57.9	0.0	0.00	5560	55.6	16.8	0.08	5716
90789	60.9	13.6	0.01	5820	70.4	18.2	0.11	5768
90889	65.3	10.6	0.01	5350	64.4	17.5	0.10	5212
90989	62.4	14.3	0.24	5396	64.7	17.9	0.06	5488
91089	69.5	12.5	0.02	5120	69.6	18.1	0.08	5488
91189	67.3	13.9	0.03	4982	70.2	18.1	0.09	5350
91289	67.8	12.0	0.04	5074	79.3	19.1	0.09	5120
91389	77.6	18.7	0.15	5258	68.1	18.0	0.07	5396
91489	67.3	17.7	0.12	5396	73.5	18.5	0.07	5258
91589	66.6	17.6	0.12	5488	67.8	17.9	0.09	5396
91689	66.9	17.7	0.12	5028	65.4	17.6	0.10	5074
91789	65.9	17.6	0.11	5304	69.5	18.1	0.09	5074
91889	B	B	B	5350	64.4	17.5	0.11	5028
91989	59.0	16.9	0.12	5396	70.6	18.2	0.08	5442
92089	67.7	17.8	0.14	5258	63.0	17.4	0.11	5258
92189	69.1	17.8	0.13	5304	66.5	17.7	0.07	5488
92289	78.6	18.7	0.15	5028	69.5	18.1	0.07	5488
92289	74.2	18.3	0.15	4982	70.3	18.3	0.05	5626
92289	84.2	19.3	0.17	5820	76.0	18.6	0.09	5258
92289	71.5	18.1	0.14	5534	71.6	18.2	0.09	5442
92289	68.0	17.8	0.15	5764	68.9	18.0	0.08	5534
92289	68.6	18.0	0.14	5672	73.8	18.5	0.06	5396
92289	68.0	17.8	0.15	5166	69.7	18.1	0.07	5396
92289	71.9	18.3	0.14	5534	76.0	18.6	0.10	5580
92289	78.8	18.8	0.18	5626	74.1	18.5	0.08	5718
92289	72.2	18.1	0.16	5580	73.9	18.5	0.08	5120
92289	71.5	18.1	0.15	5580	71.2	18.2	0.07	5258
92289	73.4	18.2	0.19	5258	75.0	18.6	0.09	5718
92289	64.4	17.2	0.14	5534	66.2	17.8	0.08	5488
92289	64.7	17.3	0.13	5534	73.1	18.6	0.07	5212
92289	72.8	18.1	0.14	5764	75.1	18.7	0.08	5626
92289	70.7	17.9	0.15	5304	66.9	17.9	0.08	5074
92389	72.4	18.2	0.13	5442	70.9	18.2	0.08	5488

Table 4. Concentrations of Gases at 0.6 and 0.3 m Depths

Date	N2-0.6m	O2-0.6m	CO2-0.6m	He-0.6m	N2-0.3m	O2-0.3m	CO2-0.3m	He-0.3m
92489	B	B	B	5258	71.2	18.4	0.07	5304
92589	83.4	19.4	0.17	5286	54.9	17.2	0.05	5194
92689	61.0	17.3	0.09	5102	58.0	17.4	0.06	5332
92789	59.9	17.2	0.10	5010	72.7	18.7	0.10	5056
92889	53.2	16.7	0.08	5148	67.6	18.3	0.09	5286
92989	74.4	18.8	0.13	5148	71.2	18.7	0.08	4780
93089	65.8	17.8	0.13	4688	72.4	18.8	0.09	5102
101689	71.4	18.9	0.11	5056	68.6	19.0	0.04	5010
101789	64.2	20.3	0.01	4780	77.0	19.2	.00	5056
101889	48.2	13.3	0.01	5102	72.5	18.3	.00	5056
101989	100.0	24.9	0.04	4826	74.8	20.3	0.01	5102
102089	71.8	20.4	0.07	4872	3.8	21.4	0.01	4964
102189	78.6	21.2	0.07	5056	76.8	21.2	0.05	5240
102289	71.7	20.5	0.06	5332	61.8	19.7	0.03	5332
102389	76.5	22.8	.00	5286	75.2	19.7	0.01	5102
102489	68.0	18.8	.00	4504	77.5	17.3	0.03	5010
102589	72.0	16.9	0.07	4964	72.4	17.8	.00	4918
102689	79.1	22.1	0.10	5056	66.5	19.1	0.02	5056
102789	66.0	21.5	0.03	5240	62.8	20.8	0.00	4688
102889	71.0	21.7	0.06	5148	68.7	19.4	0.03	4688
102989	75.5	22.3	0.03	4964	70.0	19.7	0.01	4780
103089	71.5	21.8	0.03	5148	75.7	20.3	0.02	5102
103189	73.9	19.7	0.05	5102	B	B	B	4918
110189	71.6	19.6	0.03	4642	73.0	20.1	0.01	4490
110289	77.5	20.1	0.04	4826	71.9	19.8	0.01	4596
110389	80.0	20.7	0.05	4458	89.2	22.3	0.03	5056
110489	81.2	21.0	0.03	5240	75.0	22.5	0.00	4872
110589	86.8	21.5	0.04	5424	82.9	21.4	0.02	5332
110689	63.6	17.5	.00	5286	79.5	17.4	0.01	5332
110789	79.2	22.2	0.03	5378	71.8	15.6	0.01	5332
110889	74.9	21.1	0.02	5010	78.5	22.8	0.01	5470
110989	74.3	20.1	0.01	5130	76.4	20.0	.00	5286
111089	75.9	20.8	0.01	5806	77.5	22.0	0.01	5598
111189	69.5	21.0	0.01	5806	82.8	17.0	0.02	5494
111289	70.5	21.2	0.01	5754	79.6	20.7	.00	5598
111389	71.1	20.6	0.01	5702	69.6	20.7	0.01	5546
111489	78.2	21.1	0.02	5650	79.8	21.3	0.01	5702
111589	70.8	19.8	0.04	5236	71.6	21.6	0.00	5548
111689	78.3	18.2	0.02	5548	77.0	21.9	0.00	5444
111789	65.3	20.5	0.00	5288	70.2	20.9	0.00	5600
111889	75.5	19.5	0.02	5704	70.7	20.9	0.00	5132
111989	67.5	18.6	0.02	5444	73.2	19.3	0.01	5496
112089	49.7	18.8	0.00	5860	54.7	17.6	0.04	5756
112189	55.4	19.4	0.00	5704	69.7	18.5	0.03	5808
112289	71.4	19.8	0.01	5912	72.0	21.7	0.00	5756
112389	66.1	19.1	0.01	5496	77.1	20.5	0.01	5704
112489	74.9	20.5	0.02	5808	74.1	22.5	0.00	5912
112589	74.6	20.9	0.01	5756	73.0	22.3	0.00	5600
112689	68.0	21.9	0.00	6380	67.3	13.8	0.03	5860
112789	70.4	22.2	0.00	5704	84.0	15.3	0.01	5756
112889	74.5	20.7	0.01	5756	56.6	7.3	.00	5860

Table 4. Concentrations of Gases at 0.6 and 0.3 m Depths

Date	N2-0.6m	O2-0.6m	CO2-0.6m	He-0.6m	N2-0.3m	O2-0.3m	CO2-0.3m	He-0.3m
112989	79.7	20.3	0.05	5822	67.7	14.1	0.02	5864
113089	69.8	18.9	0.05	5402	66.0	12.5	.00	5864
120189	76.6	21.9	0.00	5906	70.7	14.4	0.02	5738
120289	81.2	20.8	0.02	5696	73.5	13.7	.00	5696
120389	74.9	19.8	0.01	5738	74.3	15.8	0.01	5906
120489	54.6	20.7	0.00	5276	69.7	22.4	0.00	5780
120589	57.8	21.0	0.00	5528	62.0	19.6	0.02	5654
120689	68.6	19.9	0.04	5696	74.5	20.3	0.05	5780
120789	33.7	18.5	0.00	5780	60.9	21.3	0.00	5444
120889	61.9	18.5	.00	5738	73.9	22.8	0.00	5780
120989	72.9	22.9	0.00	5738	72.7	22.7	0.00	5570
121089	74.0	22.6	0.00	5780	67.9	19.9	0.03	5864
121189	61.3	20.8	0.00	5738	73.4	22.2	0.00	5780
121289	72.9	19.1	0.05	5422	76.6	16.1	.00	6056
121389	79.5	20.4	0.02	6020	66.1	20.9	0.00	5974
121489	41.9	19.1	0.00	5696	89.7	24.0	0.00	5812
121589	60.1	20.8	0.00	5406	78.6	22.7	0.00	5928
121689	66.6	21.4	0.00	5464	69.9	21.8	0.00	5870
121789	64.4	21.3	0.00	5696	67.2	21.7	0.00	5812
121889	73.2	21.9	0.00	5638	75.4	22.0	0.00	5812
121989	65.9	21.1	0.00	5464	68.0	21.4	0.00	5696
122089	67.1	21.3	0.00	5638	72.5	21.7	0.00	5812
122189	65.8	21.0	0.00	5638	84.6	23.0	0.00	5522
122289	69.7	22.1	0.00	5638	64.4	21.4	0.00	5580
122389	68.7	21.9	0.00	5638	73.4	22.6	0.00	4652
122489	70.3	22.2	0.00	5754	66.9	21.7	0.00	5580
122589	76.5	22.8	0.00	5348	74.5	22.7	0.00	5638
122689	72.5	22.3	0.00	5580	61.6	20.9	0.00	5250
122789	86.1	22.7	0.00	5192	75.2	21.6	0.00	5308
122889	60.0	20.1	0.00	5018	80.0	22.2	0.00	5250
122989	73.2	21.5	0.00	5148	65.8	21.0	0.00	5200
123089	67.9	20.9	0.00	5356	69.5	21.1	0.00	5044
123189	73.7	21.5	0.00	5200	63.3	20.5	0.00	5252
10190	71.7	21.3	0.00	5304	88.9	23.2	0.00	5148
10290	76.9	21.3	0.00	5304	76.9	21.3	0.00	5200
10390	68.6	20.5	0.00	5304	75.0	21.1	0.00	5304
10490	67.2	20.3	0.00	5200	72.3	20.9	0.00	5148
10590	62.1	20.1	0.00	5000	74.1	21.2	0.00	5184
10690	53.7	19.2	0.00	5138	B	B	0.00	5092
10790	67.3	20.7	0.00	5138	66.0	20.5	0.00	4954
10890	77.6	21.2	0.00	5046	69.9	20.5	0.00	5138
11990	81.9	21.6	0.00	5092	82.9	21.8	0.00	5230
12090	70.6	20.6	0.00	5000	62.1	19.9	0.00	5184
12190	60.1	19.6	0.00	5092	80.0	21.5	0.00	5184
12290	74.1	20.8	0.00	5138	83.9	21.6	0.00	5276
12390	85.7	21.0	.00	5184	73.6	21.9	0.00	5000
12490	83.9	22.8	0.00	5092	71.8	21.7	0.00	5000
12590	84.9	22.9	0.00	5276	72.6	21.9	0.00	5092
12690	71.6	21.8	0.00	5138	61.3	20.7	0.00	5138
12790	72.0	21.7	0.00	5092	68.1	21.6	0.00	5184
12890	61.3	20.6	0.00	5138	52.5	19.9	0.00	5092

Table 4. Concentrations of Gases at 0.6 and 0.3 m Depths

Date	N2-0.6m	O2-0.6m	CO2-0.6m	He-0.6m	N2-0.3m	O2-0.3m	CO2-0.3m	He-0.3m
12990	63.2	20.6	0.00	5000	42.9	18.7	0.00	5138
13090	58.7	20.0	0.00	5184	76.0	21.8	0.00	5414
13190	45.9	18.9	0.00	5184	53.5	19.4	0.00	5276
20190	73.5	21.7	0.00	5184	63.2	20.7	0.00	5230
20290	19.6	16.3	0.00	5368	59.8	20.4	0.00	5322
20390	70.4	21.6	0.00	5138	77.2	21.5	0.00	5230
20490	73.6	21.9	0.00	5414	59.3	19.6	0.00	5184
20590	49.0	19.4	0.00	5046	56.9	19.5	0.00	5276
20690	66.2	21.1	0.00	5368	56.3	19.5	0.00	5230
20790	57.7	20.2	0.00	5368	66.1	20.4	0.00	5184
20890	59.4	20.3	0.00	5414	58.4	19.7	0.00	5322
20990	53.0	19.4	0.00	5322	68.8	20.7	0.00	5184
21090	78.2	21.7	0.00	5322	66.6	20.4	0.00	5092
21190	66.4	20.7	0.00	5368	67.4	20.5	0.00	5460
21290	70.9	21.1	0.00	5414	70.8	20.9	0.00	5368
21390	67.9	20.7	0.00	5368	63.3	20.3	0.00	5368
21490	78.7	21.8	0.00	5368	85.6	22.3	0.00	5506
21590	68.4	20.7	0.00	5414	75.4	21.4	0.00	5368
21690	59.2	20.0	0.00	5092	66.7	20.7	0.00	5552
21790	70.8	20.9	0.00	5230	75.9	21.5	0.00	5092
21890	50.2	20.1	0.00	5368	52.6	19.1	0.00	5276
21990	56.1	20.7	0.00	5276	65.0	20.2	0.00	5184
22090	65.9	21.5	0.00	5460	74.4	21.2	0.00	5296
22190	58.5	19.7	0.00	5322	55.9	19.6	0.00	5368
22290	50.3	19.0	0.00	5368	47.3	18.8	0.00	5138
22390	60.8	19.9	0.00	5276	53.6	19.5	0.00	5184
22490	49.8	19.0	0.00	5276	53.0	19.4	0.00	5322
22590	50.6	19.1	0.00	5276	B	B	0.00	5184
22690	60.5	19.9	0.00	5276	60.0	20.0	0.00	5368
22790	67.2	20.6	0.00	5230	69.7	20.9	0.00	5276
22890	64.6	20.3	0.00	5230	53.5	19.4	0.00	5322
30190	54.3	19.5	0.00	5276	68.9	20.4	0.00	5230
30290	67.5	20.7	0.00	5460	65.8	20.5	0.00	5322
30390	78.2	21.6	0.00	5368	62.2	20.1	0.00	5552
30490	59.7	20.1	0.00	5414	68.1	20.8	0.00	5138
30590	63.8	17.0	0.03	5460	55.6	14.8	0.03	5414
30690	61.9	16.5	0.03	5092	60.1	16.1	0.03	5414
30790	50.8	13.5	0.02	5230	64.6	17.2	0.01	5184
30890	57.7	15.4	0.03	5184	66.1	17.6	0.03	5368
30990	93.2	24.5	0.02	5460	64.6	17.2	0.03	5460
31090	68.5	18.2	0.02	5414	72.6	19.1	0.03	5368
31190	80.2	21.3	0.02	5414	57.4	15.3	0.03	5368
31290	55.0	14.6	0.03	5138	50.0	13.3	0.03	5230
31390	50.7	13.6	0.01	5322	51.1	13.8	0.03	5368
31490	37.0	9.8	0.02	5506	35.4	9.5	0.02	5368
31590	59.1	16.0	0.03	5184	41.7	11.2	0.02	5368
31690	41.0	11.0	0.03	5368	39.9	10.7	0.02	5414
31790	50.8	13.6	0.03	5276	58.8	15.6	0.03	5276
31890	55.4	14.7	0.03	5414	53.6	14.3	0.04	5322
31990	54.8	14.6	0.03	5230	72.1	18.9	0.04	5460
32090	41.8	11.2	0.03	5230	59.9	15.8	0.02	5460

Table 4. Concentrations of Gases at 0.6 and 0.3 m Depths

Date	N2-0.6m	O2-0.6m	CO2-0.6m	He-0.6m	N2-0.3m	O2-0.3m	CO2-0.3m	He-0.3m
32190	51.0	13.6	0.03	5440	45.2	12.2	0.02	5188
32290	53.9	14.3	0.03	5482	65.1	17.1	0.04	5356
32390	62.5	16.5	0.04	5314	62.7	16.5	0.03	5146
32490	80.2	20.9	0.04	5272	74.4	19.5	0.04	5440
32590	71.3	18.7	0.04	5314	75.4	19.8	0.04	5104
32690	67.4	17.7	0.04	5440	58.4	15.6	0.03	5272
32790	87.9	22.7	0.04	5398	72.2	19.0	0.04	5398
32890	69.4	18.2	0.04	5314	58.2	15.4	0.03	5272
32990	76.6	20.0	0.04	5314	66.1	17.5	0.03	5272
33090	87.1	22.6	0.05	5398	82.8	21.5	0.04	5356
33190	79.0	20.7	0.04	5482	73.4	19.2	0.03	5272
40190	61.6	16.1	0.03	5440	58.2	15.3	0.03	5272
40290	77.0	20.0	0.05	5314	60.8	16.0	0.04	5356
40390	58.7	15.6	0.03	5272	72.8	19.2	0.04	5398
40490	68.9	18.1	0.04	5482	52.5	14.0	0.02	5146
40590	79.8	20.9	0.04	5356	82.5	21.6	0.04	5482
40690	77.3	20.2	0.05	5552	57.6	15.3	0.03	5368
40790	76.6	20.0	0.05	5460	70.3	18.5	0.04	5506
40890	62.8	16.6	0.04	5276	62.0	16.5	0.04	5230
40990	54.6	14.5	0.03	5460	74.5	19.6	0.04	5506
41090	66.3	17.6	0.04	5368	53.2	14.2	0.03	5460
41190	54.6	14.5	0.03	5322	55.0	14.6	0.03	5322
41290	72.1	19.1	0.04	5506	75.8	20.1	0.03	5506
41390	75.2	19.9	0.04	5368	67.8	17.9	0.04	5506
41490	71.4	18.9	0.02	5322	69.6	18.5	0.04	5552
41590	61.2	16.3	0.04	5368	53.0	14.1	0.04	5276
41690	75.8	19.9	0.04	5368	94.6	24.8	0.05	5368
41790	63.1	16.6	0.03	5414	88.3	22.7	0.04	5552
41890	63.7	16.4	0.03	5308	92.0	23.6	0.04	5400
41990	60.4	15.6	0.03	5354	62.2	16.1	0.04	5354
42090	77.5	19.9	0.05	5400	92.2	23.7	0.05	5446
42190	76.5	19.6	0.04	5443	64.7	16.7	0.04	5354
42290	68.2	17.5	0.04	5354	61.7	16.1	0.04	5354

Table 5. Basic statistics--minimum, maximum, and mean values

[cm = centimeter; m = meters; % = percent; °C = degrees Celsius; ppb = parts per billion]

	Minimum	Maximum	Mean		
Soil temperature, 20 cm (°C)	3.0	21.0	13.6	±	5.0
Soil temperature, 5 cm (°C)	0.0	24.5	14.0	±	5.8
Air temperature (°C)	-16.0	39.0	15.8	±	10.4
Relative humidity (%)	21.0	100.0	53.2	±	17.0
Barometric pressure (cm)	74.52	77.14	76.18	±	0.44
Rain (cm)	0.0	2.5	0.1	±	0.4
Snow (cm)	0.0	45.0	0.5	±	3.0
Wind direction (degrees)	0	360	192.0	±	117.0
Wind speed (km/h)	0.0	59.3	18.8	±	9.8
Soil gases--2.0-m depth					
N ₂ (%)	35.9	100.0	67.3	±	9.4
O ₂ (%)	9.6	28.6	18.4	±	2.4
CO ₂ (%)	0.0	0.53	0.10	±	0.09
He (ppb)	4600	6070	5340	±	235
Soil gases--1.2-m depth					
N ₂ (%)	44.6	100.0	68.1	±	9.0
O ₂ (%)	10.7	25.8	18.8	±	2.5
CO ₂ (%)	0.0	0.39	0.10	±	0.09
He (ppb)	4830	5870	5330	±	220
Soil gases--0.6-m depth					
N ₂ (%)	19.6	100.0	67.3	±	9.2
O ₂ (%)	0.0	24.9	19.0	±	2.7
CO ₂ (%)	0.0	0.45	0.06	±	0.07
He (ppb)	4460	6380	5350	±	260
Soil gases--0.3-m depth					
N ₂ (%)	3.8	94.6	68.2	±	9.1
O ₂ (%)	7.3	24.8	19.0	±	2.7
CO ₂ (%)	0.0	0.59	0.05	±	0.06
He (ppb)	4490	6060	5340	±	260

Table 6. Basic Statistics: Correlation coefficients of gases at different depths. All values above 0.15 are significant at the 99 percent confidence level.

[m = meters]

Depths	N ₂ -N ₂	C ₂ -C ₂	CO ₂ -CO ₂	He-He	
0.3-0.6 m		0.38	0.51	0.56	0.59
0.3-1.2 m		0.39	0.50	0.58	0.49
0.3-2.0 m		0.27	0.37	0.43	0.52
0.6-1.2 m		0.44	0.62	0.73	0.53
0.6-2.0 m		0.26	0.39	0.61	0.55
1.2-2.0 m		0.41	0.55	0.77	0.50
<u>Depth</u>		<u>CO₂-O₂</u>			
0.3 m		-0.18			
0.6 m		-0.24			
1.2 m		-0.17			
2.0 m		-0.12			

Table 7. Correlation coefficients greater than 0.20 for CO₂, He (0.3 m), and meteorological conditions. All values are significant at the 99 percent confidence level.

[m = meter; cm = centimeter; leaders (---) = no data available]

	CO ₂ -2 m	CO ₂ -1.2 m	CO ₂ -0.6 m	CO ₂ -0.3 m	He-0.3 m
Soil temp, 20 cm	0.63	0.73	0.70	0.67	---
Soil temp, 5 cm	0.59	0.68	0.68	0.65	---
Air temp	0.48	0.53	0.56	0.52	-0.23
Relative humidity	-0.21	-0.22	-0.30	-0.27	---
Barometric pressure	0.39	0.43	0.34	0.28	---
Wind speed	---	---	---	-0.21	---