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WASHINGTON PUBLIC POWER SUPPLY SYSTEM

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April 26, 1989

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U.S. Nuclear Regulatory Commission
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Dear Sirs:

Subject: NUCLEAR PLANT NO. 2
ANNUAL ENVIRONMENTAL OPERATING REPORT

Reference: Facility Operating License NPF-21
Appendix B - Environmental Protection Plan

Per Section 5.4.1 of the referenced EPP, please find attached the subject report for the 1988 calendar year.

Very truly yours,

G. C. Sorensen, Manager
Regulatory Programs

JPC/tlr

Attachment

cc: Mr. C. J. Bosted, Resident NRC Inspector (901A)
Mr. W. L. Fitch, EFSEC
Mr. J. B. Martin, Region V NRC
Mr. R. B. Samworth, NRC

IE25

SUPPLY SYSTEM NUCLEAR PLANT NO. 2

ANNUAL ENVIRONMENTAL OPERATING REPORT

1988

ENVIRONMENTAL PROGRAMS DEPARTMENT

WASHINGTON PUBLIC POWER SUPPLY SYSTEM

APRIL 1989

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## INTRODUCTION

The WNP-2 Environmental Protection Plan (Appendix B to Operating License No. NPF-21) addresses the protection of nonradiological environmental values during plant operation. Section 3.0 of the EPP requires that changes in plant design and operation be assessed for environmental impacts against the impacts which were projected by the NRC at the time the plant was licensed. Changes which involve an unreviewed environmental question (defined in the EPP) must be approved by the NRC. Section 4.0 requires the reporting of events which may result in significant environmental impacts and also requires a soil and vegetation monitoring program to evaluate cooling tower drift impacts. Section 5.0 addresses administrative matters and requires an annual report on several EPP conditions including the monitoring program. This Annual Environmental Operating Report is submitted per Section 5.4.1 of the EPP.

## UNREVIEWED ENVIRONMENTAL QUESTIONS

A proposed change, test, or experiment is deemed to involve an unreviewed environmental question if it concerns: (1) a matter which may result in a significant increase in any adverse environmental impact previously evaluated in the environmental licensing documentation; or (2) a significant change in effluents or power level; or (3) a matter not previously evaluated in the environmental documentation which may have a significant environmental impact (EPP Section 3.1). No design or operational changes, tests, or experiments in 1988 involved an unreviewed environmental question.

## COOLING TOWER DRIFT STUDIES

Section 4.2.1 of the EPP requires a monitoring program, of at least three years duration, to assess the effects of cooling tower drift. As in previous years, soil and vegetation samples were collected in May at four grassland (G01-G04) and five shrub (S01-S05) sites (see Figure 1) and analyzed for relevant chemistry parameters. Analytical methods were described in the Environmental Operating Report for 1985.

### Soil Chemistry Results

The results of the 1988 soil chemistry analyses are provided in Table 1. The results for 1980-1988 are displayed in Figures 2 through 19. Results prior to 1985 are based on a single sample

at each location. In 1985 and succeeding years results are the means of five samples collected at a station. Soils at all sample sites range from sandy to sandy loam and contain a low percentage of clay. Soil pH values in the years of operation (1984-1988) are generally lower than measurements during the period before operation (see Figure 2). It is difficult to attribute this to a cooling tower effect since the lower pH is observed at all locations, including Station SO5, more than four (4) miles from the towers. Soil conductivity (Figure 3) was generally within the range of previously observed values for the operational period except at Station GO3 about 300 meters south of the cooling towers. With the exception of Station GO3, soil sulfate concentrations at all sites were in the range of values recorded for the immediately preceding years (Figure 4). Although Station GO3 showed a substantial increase in sulfate, the concentration (approx. 18 ug/g) was less than recorded in 1985 and preoperational years 1980 and 1981.

Calcium (Figure 5) was generally lower than measurements recorded in the preceding years of operation while magnesium (Figure 6) was slightly higher compared to the same period. Sodium (Figure 7) and potassium (Figure 8) were the same or slightly elevated over the 1987 measurements at most stations. Bicarbonate concentrations (Figure 9) in 1988 continued to be at levels generally higher than recorded during the preoperational period. Chloride concentrations (Figure 10) were much lower than in previous years at all stations. The chloride measurements at Station GO3 do not trend with the conductivity results discussed above.

The results of soil metals analyses are shown in Figures 11 through 16. No trends or abnormalities are evident in the measured concentrations of copper, lead, cadmium, chromium, nickel, and zinc.

Vegetation Chemistry Results

The results of the 1988 vegetation chemical analyses are presented in Table 2. Total copper and extractable sulfate and chloride concentrations in samples of Poa sandbergii and Bromus tectorum are shown in Figures 17, 18, and 19. Increases (as compared to all previous years) in extractable chloride were evident at Station SO3 for Poa sandbergii and at Station GO2 for Bromus tectorum. Other measurements were within ranges observed in previous years.

Soil and Vegetation Study Summary

Although some stations show departure from means of historical data for some chemical parameters, no adverse trends or impacts are apparent from the five years of operational data. Whereas the EPP requirement is three years of data supporting the no-

adverse-impact hypothesis, future annual environmental operating reports will not report on the results of soil and vegetation chemistry studies. These studies will be continued, however, and the NRC will be informed of the observations through distribution of the annual nonradiological environmental monitoring report which is prepared for the State of Washington.

## NONROUTINE REPORTS

During 1988 there were no nonroutine reports required by Section 5.4.2 of the EPP nor were there any EPP noncompliances.

## NPDES PERMIT-RELATED REPORTS

Monthly discharge monitoring reports were submitted to the Energy Facility Site Evaluation Council (EFSEC) during 1988. A summary of the data reported is shown in Tables 3 and 4. There were no instances of noncompliance with the permit conditions during this period.

TABLE 1

SOIL CHEMISTRY AT NINE SAMPLE LOCATIONS, MAY 1988

| | G01 | G02 | G03 | G04 | S01 | S02 | S03 | S04 | S05 |
|---|---|---|---|---|---|---|---|---|---|
| pH ( 1:2 soil-water ) | 6.92 | 6.99 | 6.71 | 6.78 | 6.86 | 7.20 | 6.77 | 6.75 | 6.99 |
| Conductivity (1:2 soil-water) microsiemens/cm | 35.3 | 46.6 | 125.6 | 21.2 | 23.2 | 61.4 | 43.8 | 49.9 | 40.5 |
| Sulfate ug/gm | 0.40 | 3.54 | 18.56 | 0.84 | 1.44 | 3.72 | 3.82 | 4.06 | 4.26 |
| Chloride ug/gm | 1.20 | 1.44 | 2.48 | 0.48 | 0.96 | 1.44 | 1.84 | 2.40 | 1.28 |
| Copper ug/gm | 12.04 | 12.90 | 11.08 | 9.97 | 10.55 | 9.50 | 12.32 | 14.04 | 9.74 |
| Lead ug/gm | 4.59 | 4.27 | 3.73 | 3.08 | 3.50 | 2.21 | 2.60 | 3.65 | 2.29 |
| Cadmium ug/gm | 0.0800 | 0.064 | 0.064 | 0.063 | 0.069 | 0.039 | 0.085 | 0.088 | 0.070 |
| Chromium ug/gm | 12.00 | 11.90 | 9.48 | 8.97 | 4.77 | 4.69 | 6.47 | 8.46 | 7.08 |
| Nickel ug/gm | 11.93 | 10.02 | 8.64 | 7.78 | 12.96 | 12.98 | 10.83 | 13.34 | 9.67 |
| Zinc ug/gm | 48.72 | 50.56 | 47.18 | 45.31 | 47.79 | 28.12 | 47.04 | 48.51 | 44.54 |
| Sodium % | 0.109 | 0.150 | 0.108 | 0.111 | 0.054 | 0.030 | 0.089 | 0.067 | 0.081 |
| Potassium % | 0.272 | 0.274 | 0.192 | 0.154 | 0.175 | 0.110 | 0.210 | 0.201 | 0.155 |
| Calcium % | 0.23 | 0.23 | 0.24 | 0.23 | 0.22 | 0.30 | 0.24 | 0.24 | 0.23 |
| Bicarbonate (meq /HCO3/gm) | 0.0014 | 0.0023 | 0.0018 | 0.0009 | 0.0009 | 0.0035 | 0.0022 | 0.0016 | 0.0025 |
| Magnesium % | 0.53 | 0.57 | 0.47 | 0.44 | 0.52 | 0.43 | 0.48 | 0.49 | 0.45 |

TABLE 2

VEGETATION CHEMISTRY AT NINE SAMPLE LOCATIONS, MAY 1988

| | SITE | POSA* | BRTE | SIAL | PHLO | PUTR | ARTR |
|---|---|---|---|---|---|---|---|
| Copper (ug/gm) | G01 | 4.25 | 6.00 | 6.75 | 6.15 | - | - |
| | G02 | 3.45 | 5.80 | 6.00 | 4.45 | - | - |
| | G03 | - | 4.80 | 4.60 | 4.85 | 6.50 | - |
| | G04 | 4.35 | 4.80 | - | 4.20 | 4.90 | - |
| | S01 | 4.25 | 4.95 | 4.40 | 4.85 | - | - |
| | S02 | - | 5.40 | - | 3.75 | 5.75 | 5.40 |
| | S03 | 3.85 | 5.10 | - | 4.65 | - | 10.95 |
| | S04 | - | 5.80 | 5.05 | 4.50 | - | 25.50 |
| | S05 | 3.95 | 4.40 | - | - | 4.15 | 16.55 |
| Extractable Sulfate (%) | G01 | 0.019 | 0.018 | 0.115 | 0.019 | - | - |
| | G02 | 0.019 | 0.019 | 0.103 | 0.018 | - | - |
| | G03 | - | 0.019 | 0.115 | 0.020 | 0.021 | - |
| | G04 | - | 0.020 | 0.086 | 0.018 | 0.021 | - |
| | S01 | 0.018 | 0.018 | 0.121 | 0.018 | - | - |
| | S02 | - | 0.021 | - | 0.018 | 0.021 | 0.018 |
| | S03 | 0.020 | 0.019 | - | 0.020 | - | 0.024 |
| | S04 | - | 0.021 | 0.086 | 0.020 | - | 0.022 |
| | S05 | 0.018 | 0.017 | - | - | 0.018 | 0.024 |
| Extractable Chloride (%) | G01 | 0.27 | 0.28 | 0.54 | 0.12 | - | - |
| | G02 | 0.25 | 0.30 | 0.90 | 0.14 | - | - |
| | G03 | - | 0.26 | 0.64 | 0.16 | 0.12 | - |
| | G04 | - | 0.17 | 0.49 | 0.10 | 0.11 | - |
| | S01 | 0.19 | 0.27 | 0.50 | 0.09 | - | - |
| | S02 | - | 0.17 | - | 0.10 | 0.12 | 0.75 |
| | S03 | 0.27 | 0.14 | - | 0.09 | - | 0.50 |
| | S04 | - | 0.23 | 0.57 | 0.13 | - | 1.38 |
| | S05 | 0.22 | 0.21 | - | - | 0.14 | 0.84 |

*POSA = Poa sandbergii
BRTE = Bromus tectorum
SIAL = Sisymbrium altissium
PHLO = Phlox longifolia
PUTR = Purshia tritentata
ARTR = Artemisia tridentata

TABLE 3

WNP-2 LOW VOLUME WASTE DISCHARGES*, 1988

| MONTH | DAYS of DSCHG | FLOW (gallons x 1000) Total | Ave | Max | OIL & GREASE (lbs/day) Ave | Max | SUSP. SOLIDS (lbs/day) Ave | Max |
|---|---|---|---|---|---|---|---|---|
| JAN | 4 | 182.5 | 13.0 | 28.7 | 0.15 | 0.83 | 4.86 | 27.70 |
| FEB | 14 | 181.3 | 13.0 | 30.3 | 0.24 | 1.89 | 3.69 | 17.98 |
| MAR | 12 | 132.6 | 11.1 | 19.4 | 0.05 | 0.14 | 2.16 | 15.35 |
| APR | 15 | 213.0 | 14.2 | 27.5 | 0.11 | 0.58 | 4.52 | 32.08 |
| MAY | 8 | 90.5 | 11.3 | 24.4 | 0.05 | 0.16 | 3.13 | 13.50 |
| JUN | 6 | 61.2 | 10.2 | 14.5 | 0.06 | 0.11 | 0.34 | 0.89 |
| JUL | 10 | 96.7 | 9.7 | 26.0 | 0.06 | 0.19 | 0.45 | 1.07 |
| AUG | 13 | 149.2 | 11.5 | 21.7 | 0.08 | 0.28 | 3.72 | 19.50 |
| SEP | 11 | 131.8 | 12.0 | 15.0 | 0.05 | 0.06 | 2.45 | 12.15 |
| OCT | 11 | 143.2 | 13.0 | 25.8 | 0.15 | 1.05 | 3.49 | 18.95 |
| NOV | 16 | 190.1 | 11.9 | 19.5 | 0.08 | 0.37 | 4.74 | 23.79 |
| DEC | 14 | 170.6 | 12.2 | 15.3 | 0.30 | 2.15 | 1.76 | 11.61 |
| Permit Limit | | | 20.0 | 40.0 | 2.50 | 7.00 | 5.00 | 34.00 |

* Neutralization Tank releases to recirculating cooling water.

TABLE 4

WNP-2 COOLING WATER BLOWDOWN DISCHARGES; 1988

| Month | Days Dschgng | pH High | pH Low | TRC (mg/l) | Discharge Volume (millions of gallons) Total | Ave* | Max** |
|---|---|---|---|---|---|---|---|
| Jan | 27 | 8.3 | 7.9 | <0.1 | 37.19 | 1.38 | 5.55 |
| Feb | 13 | 8.3 | 7.6 | <0.1 | 20.94 | 1.61 | 2.37 |
| Mar | 26 | 8.2 | 6.7 | <0.1 | 44.02 | 1.69 | 4.97 |
| Apr | 30 | 8.3 | 7.5 | <0.1 | 40.39 | 1.35 | 1.79 |
| May | 14 | 8.2 | 7.3 | <0.1 | 9.20 | 0.66 | 1.37 |
| Jun | 27 | 8.5 | 7.2 | <0.1 | 31.10 | 1.15 | 3.73 |
| Jul | 31 | 8.5 | 7.8 | <0.1 | 71.04 | 2.29 | 4.67 |
| Aug | 29 | 8.4 | 7.8 | <0.1 | 36.08 | 1.24 | 2.49 |
| Sep | 29 | 8.3 | 7.4 | <0.1 | 49.08 | 1.69 | 6.41 |
| Oct | 30 | 8.3 | 7.9 | <0.1 | 42.10 | 1.40 | 2.22 |
| Nov | 30 | 8.5 | 7.9 | <0.1 | 33.88 | 1.13 | 2.00 |
| Dec | 24 | 8.5 | 7.9 | <0.1 | 24.28 | 1.01 | 1.73 |
| Permit Limit | | 9.0 | 6.5 | 0.1 | | 5.00 | 9.40 |

* Average daily discharge during month.
** Maximum daily discharge during month.

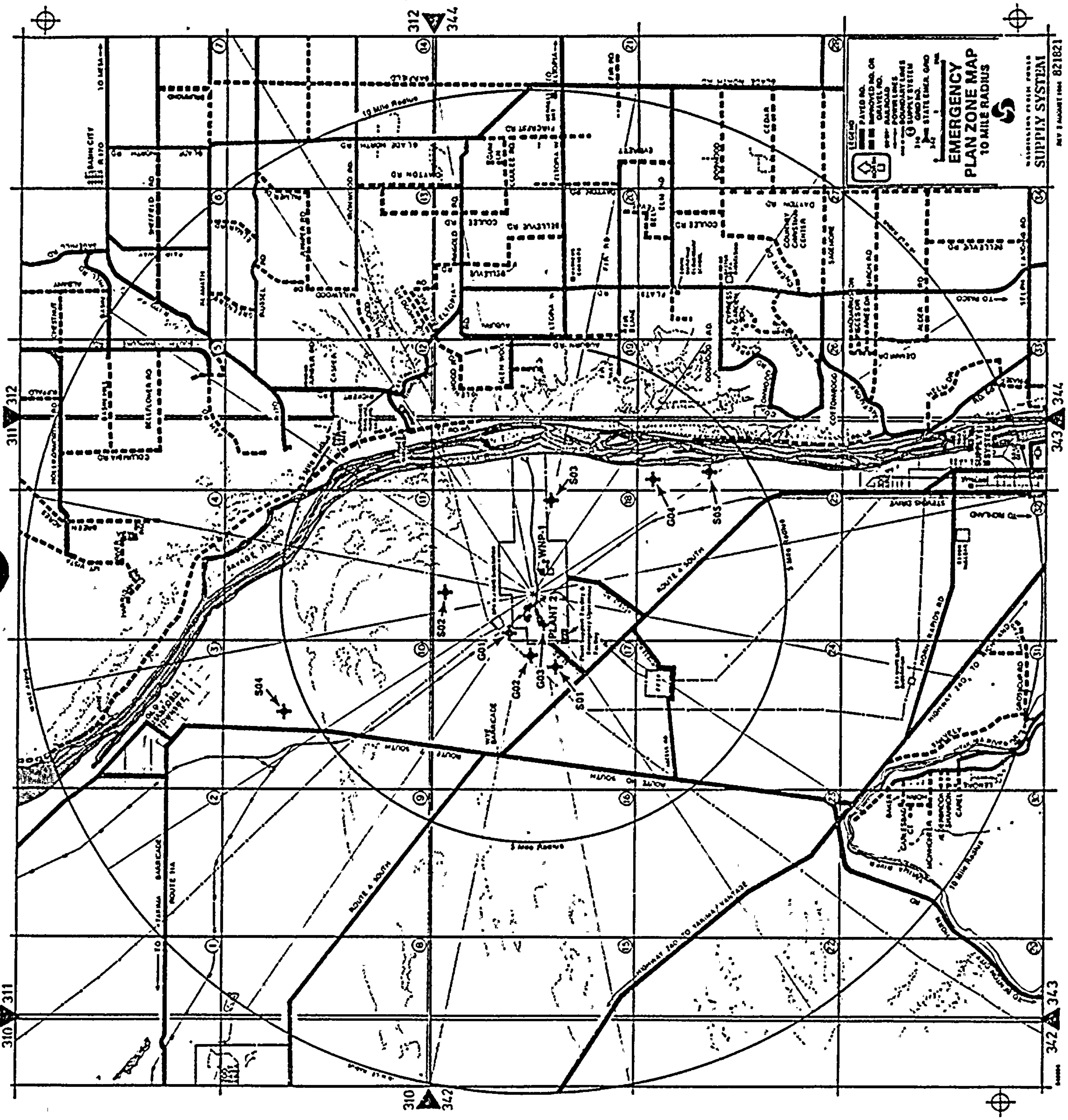



FIGURE 1. SOIL & VEGETATION CHEMISTRY SAMPLE LOCATIONS

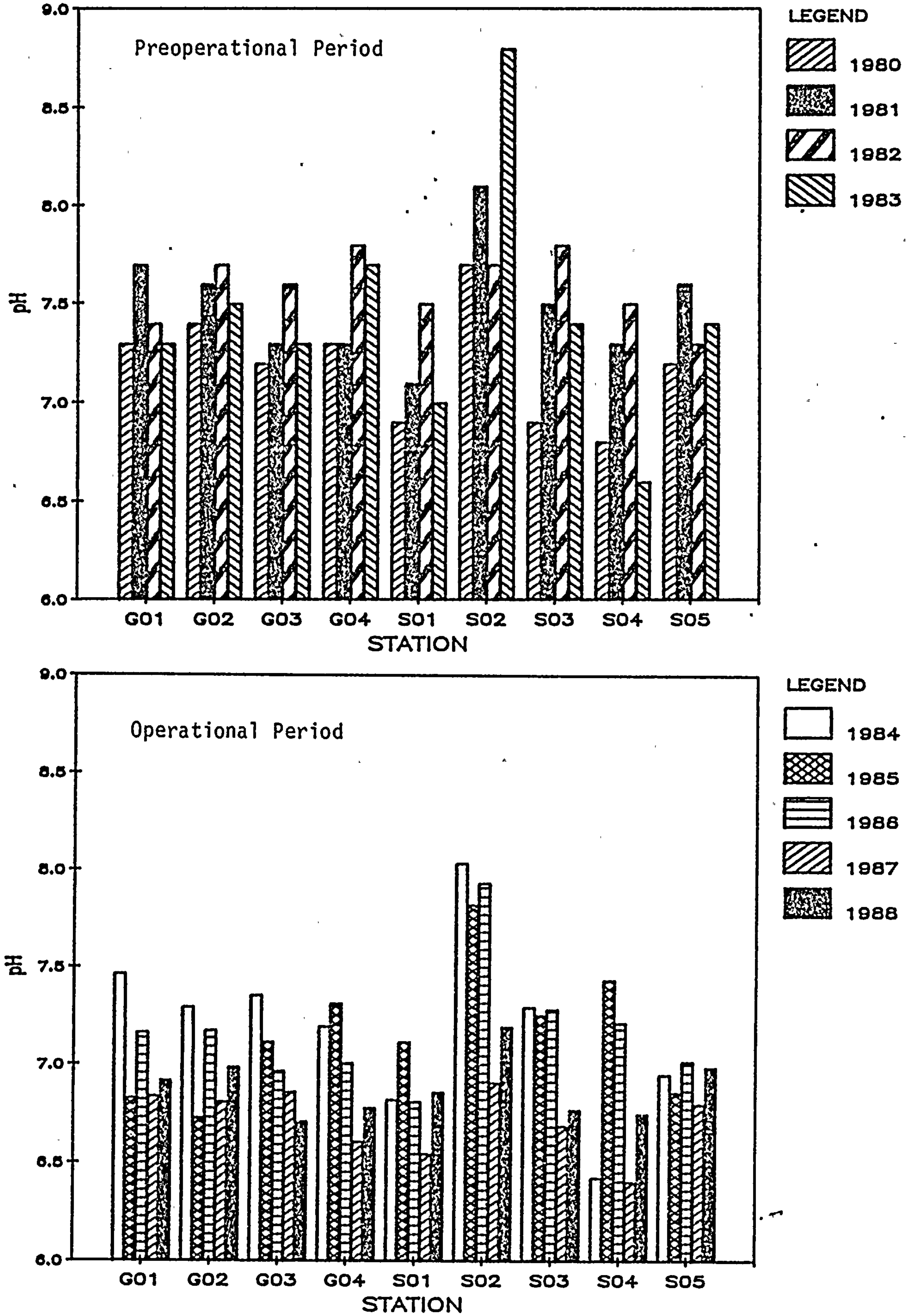
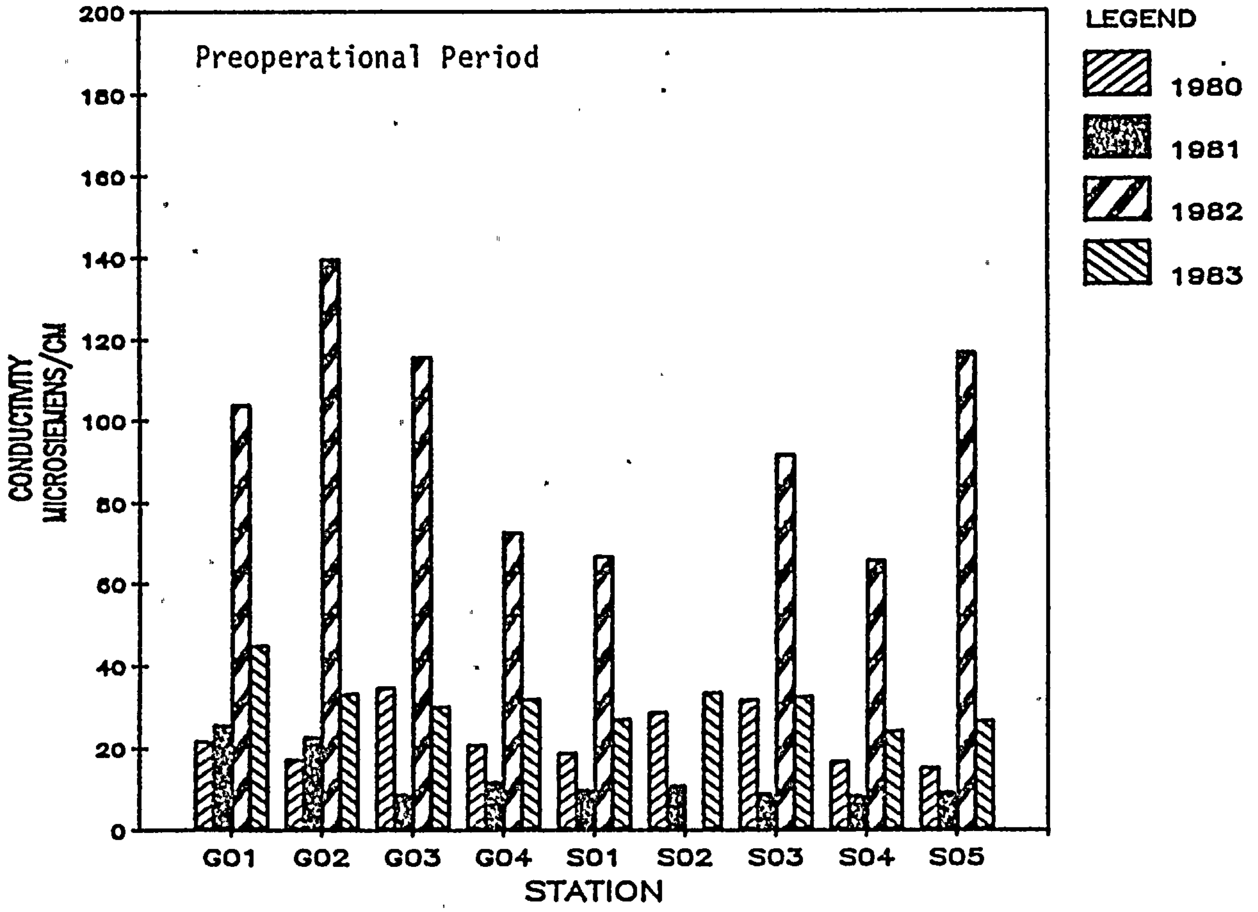



FIGURE 2. SOIL pH, 1980-1988



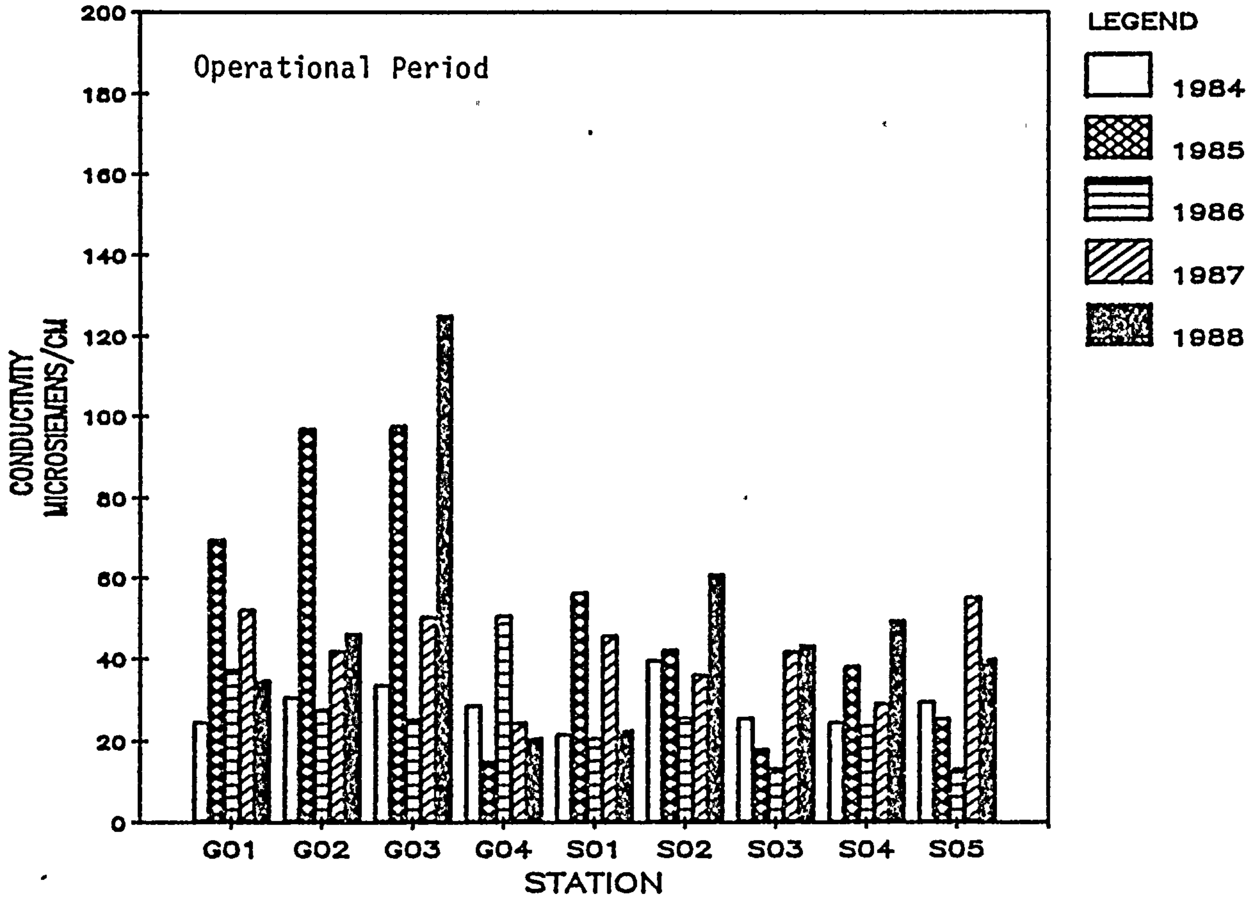




FIGURE 3. SOIL CONDUCTIVITY, 1980-1988

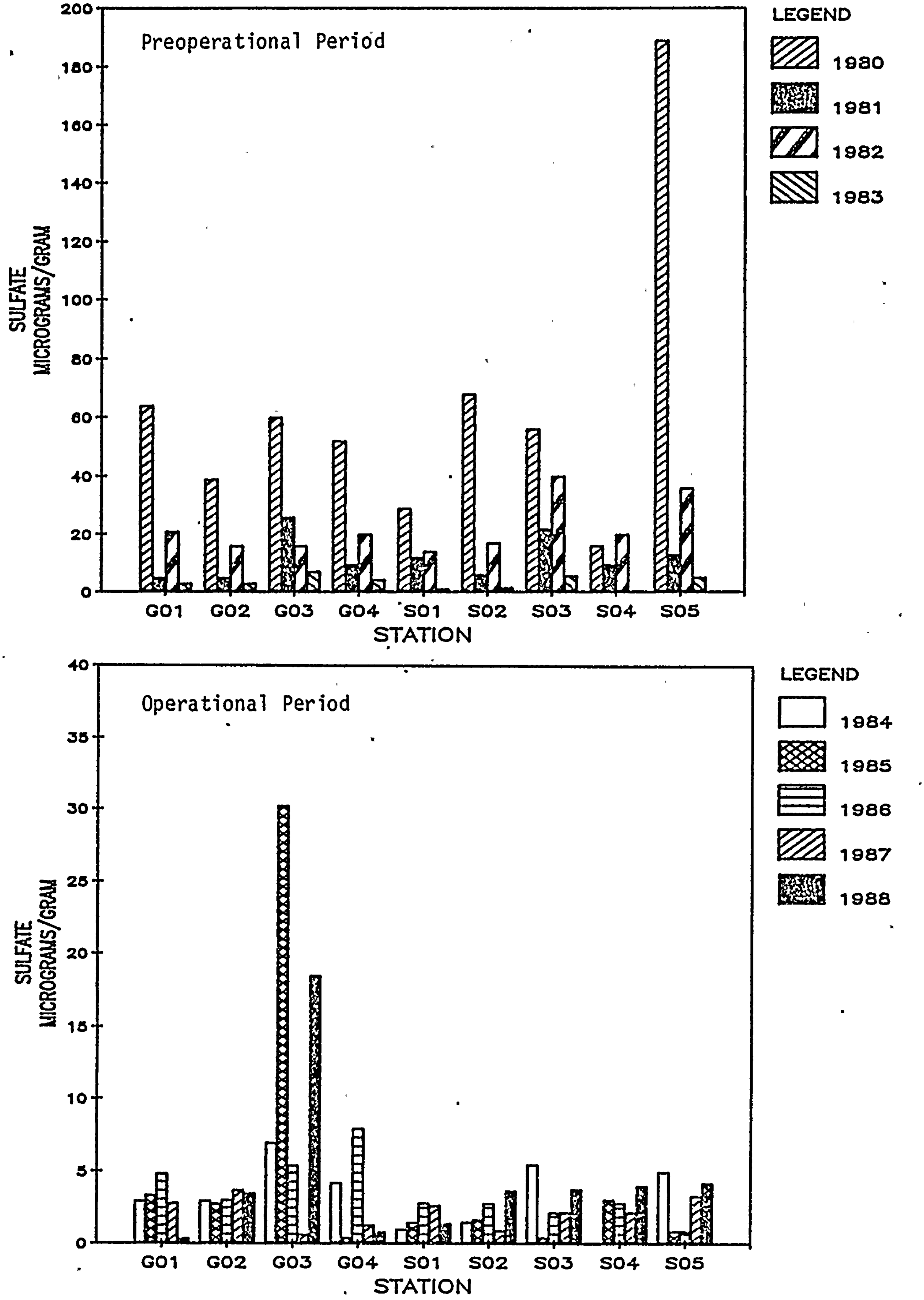



FIGURE 4. SOIL SULFATE, 1980-1988

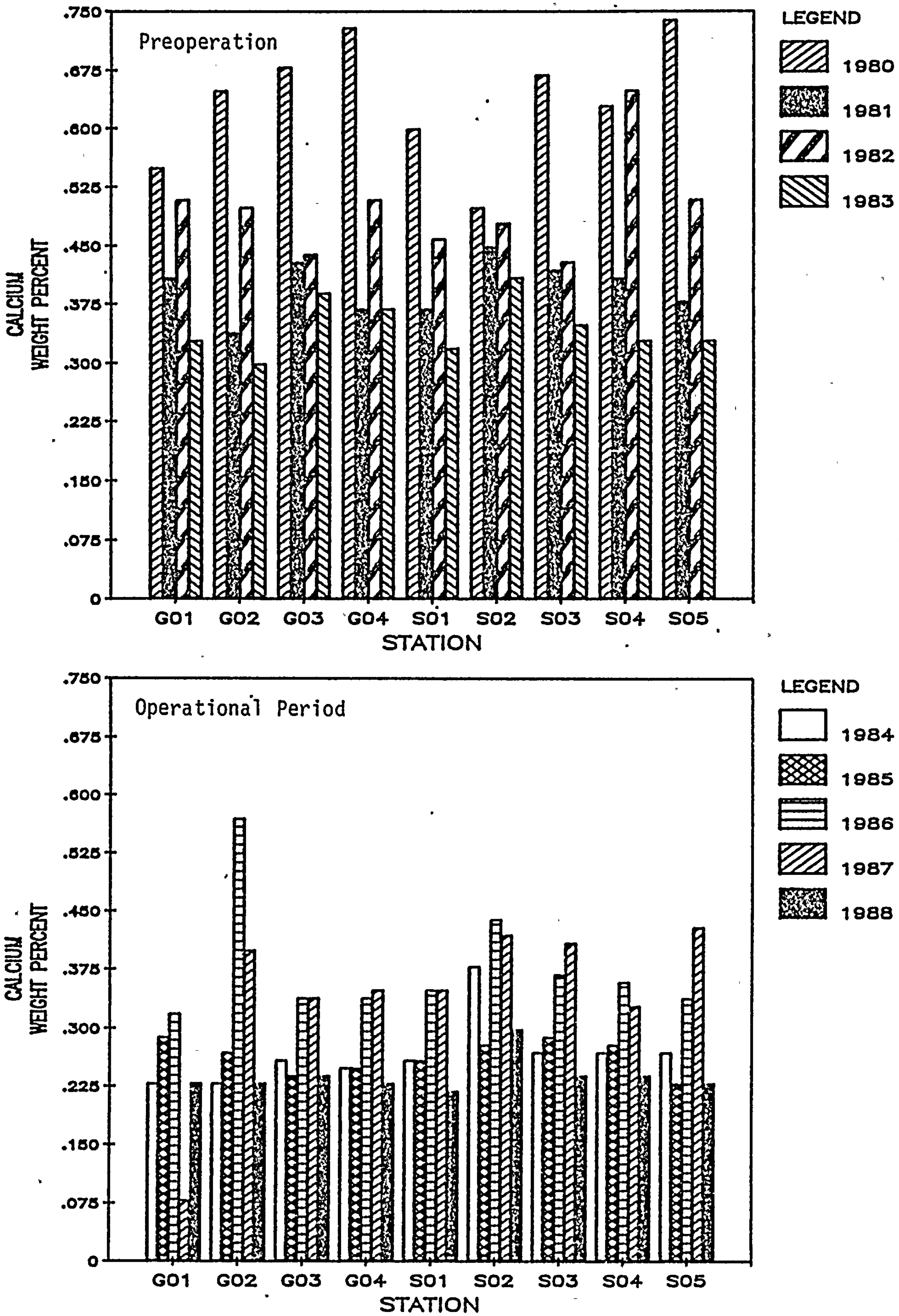



FIGURE 5. SOIL CALCIUM (wt %), 1980-1988

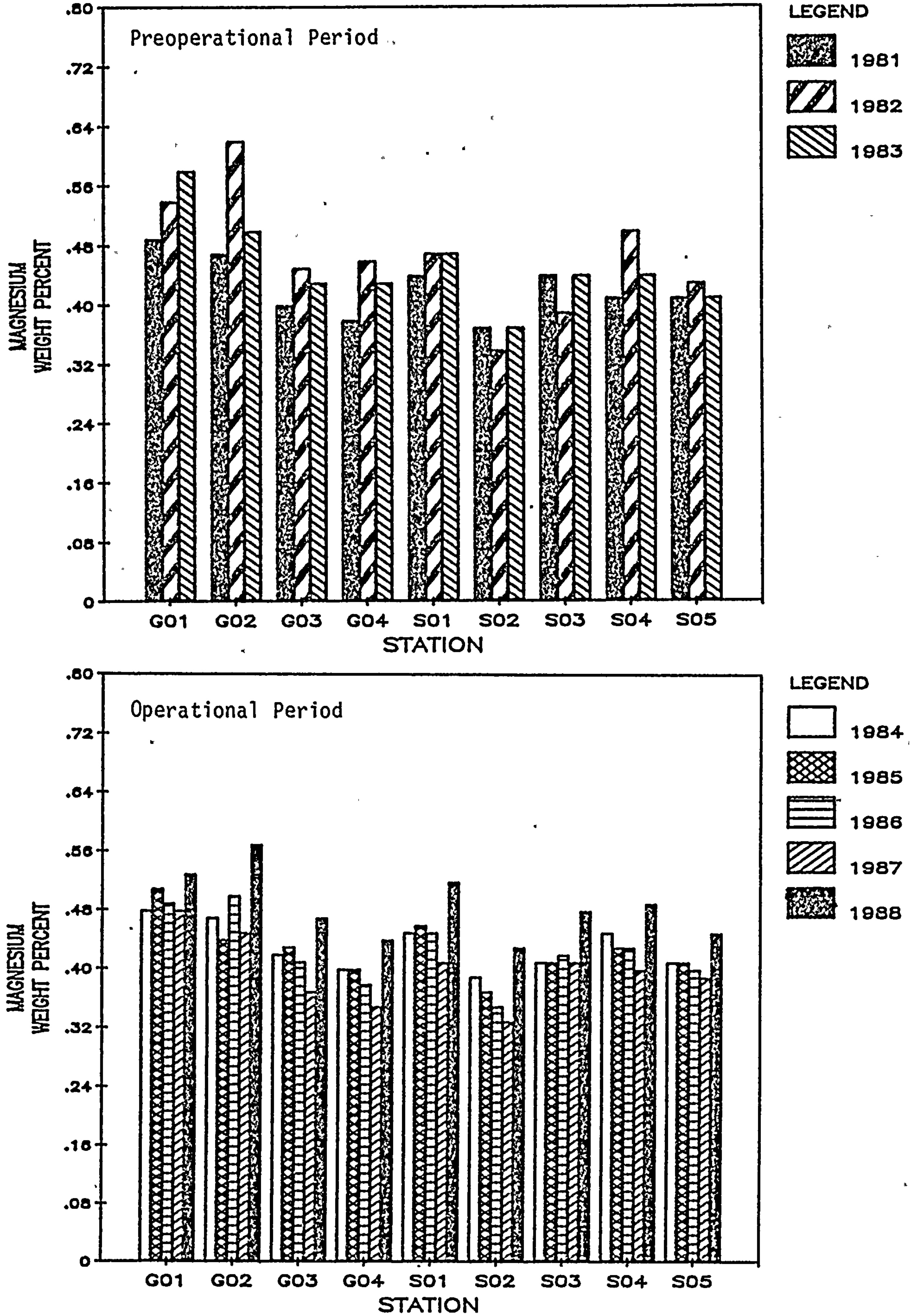



FIGURE 6. SOIL MAGNESIUM (wt %), 1981-1988

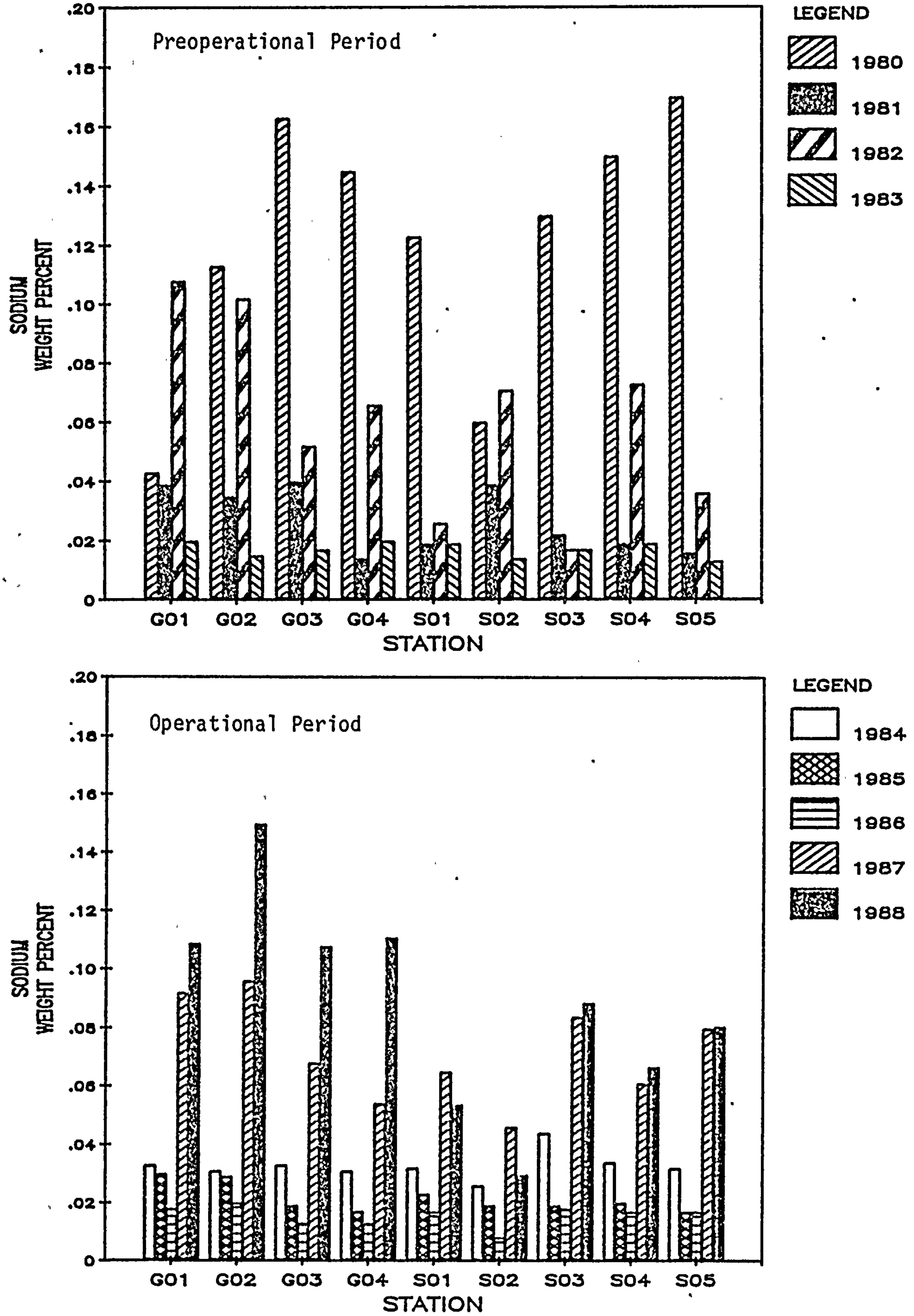



FIGURE 7. SOIL SODIUM (wt %), 1980-1988

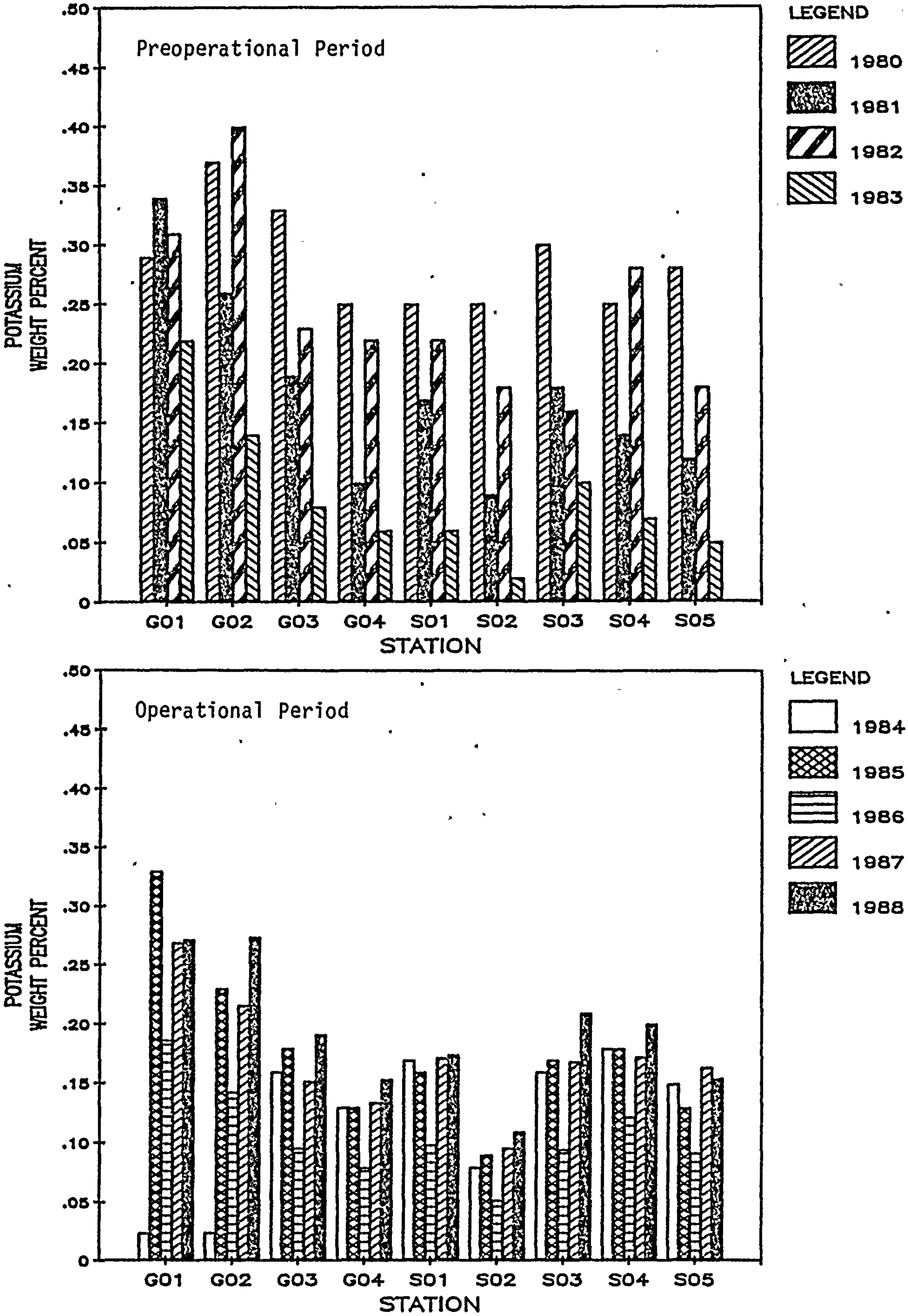
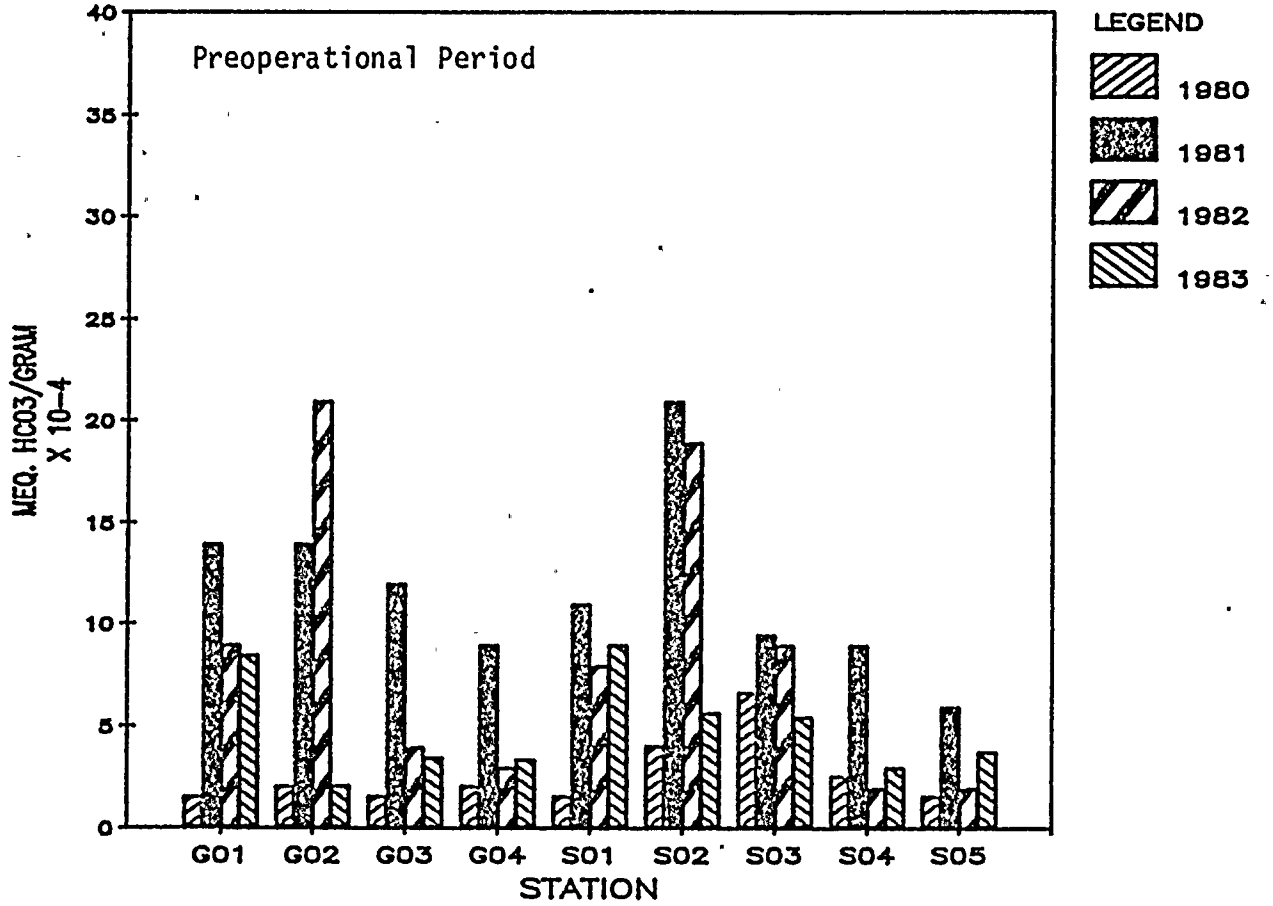



FIGURE 8. SOIL POTASSIUM (wt %), 1980-1988



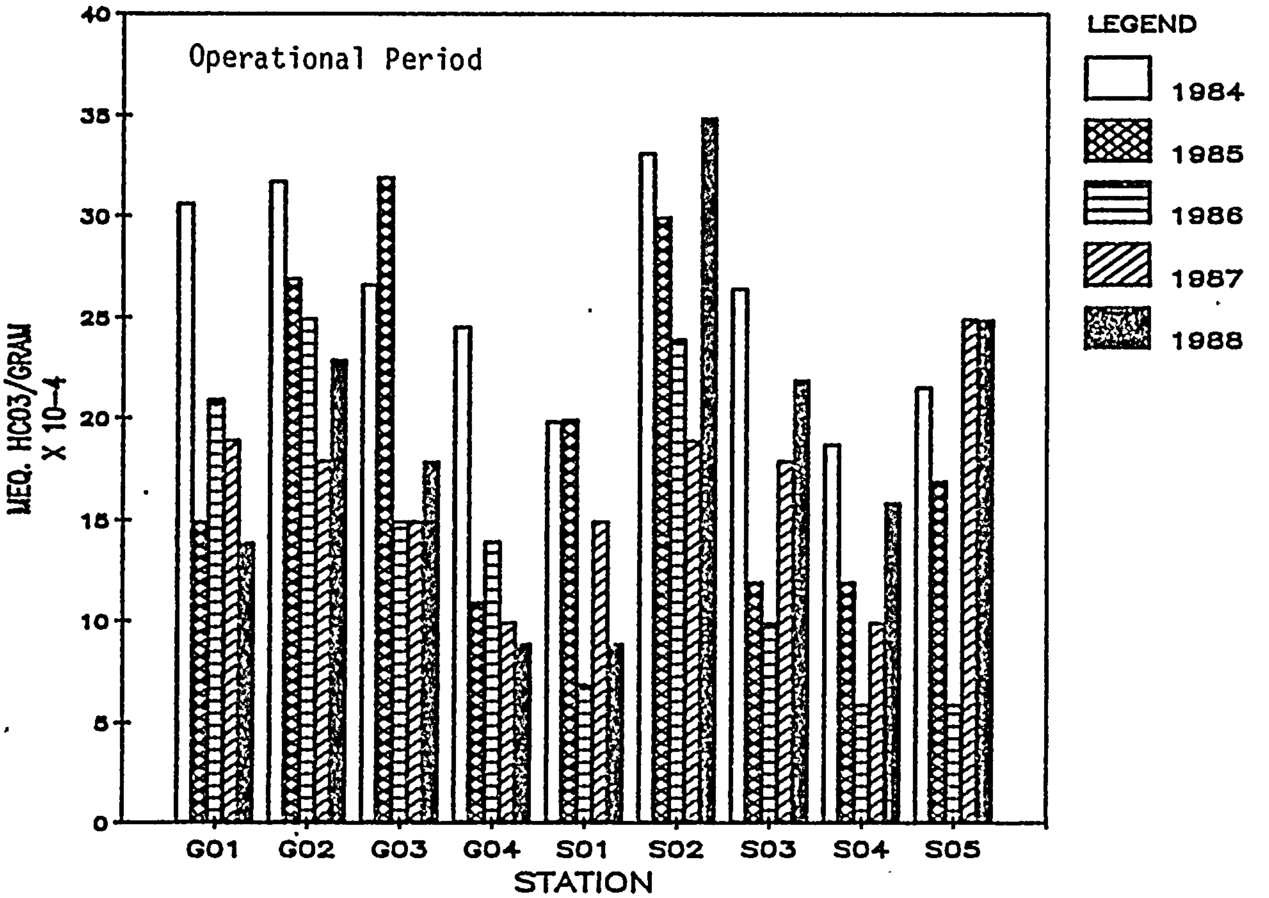
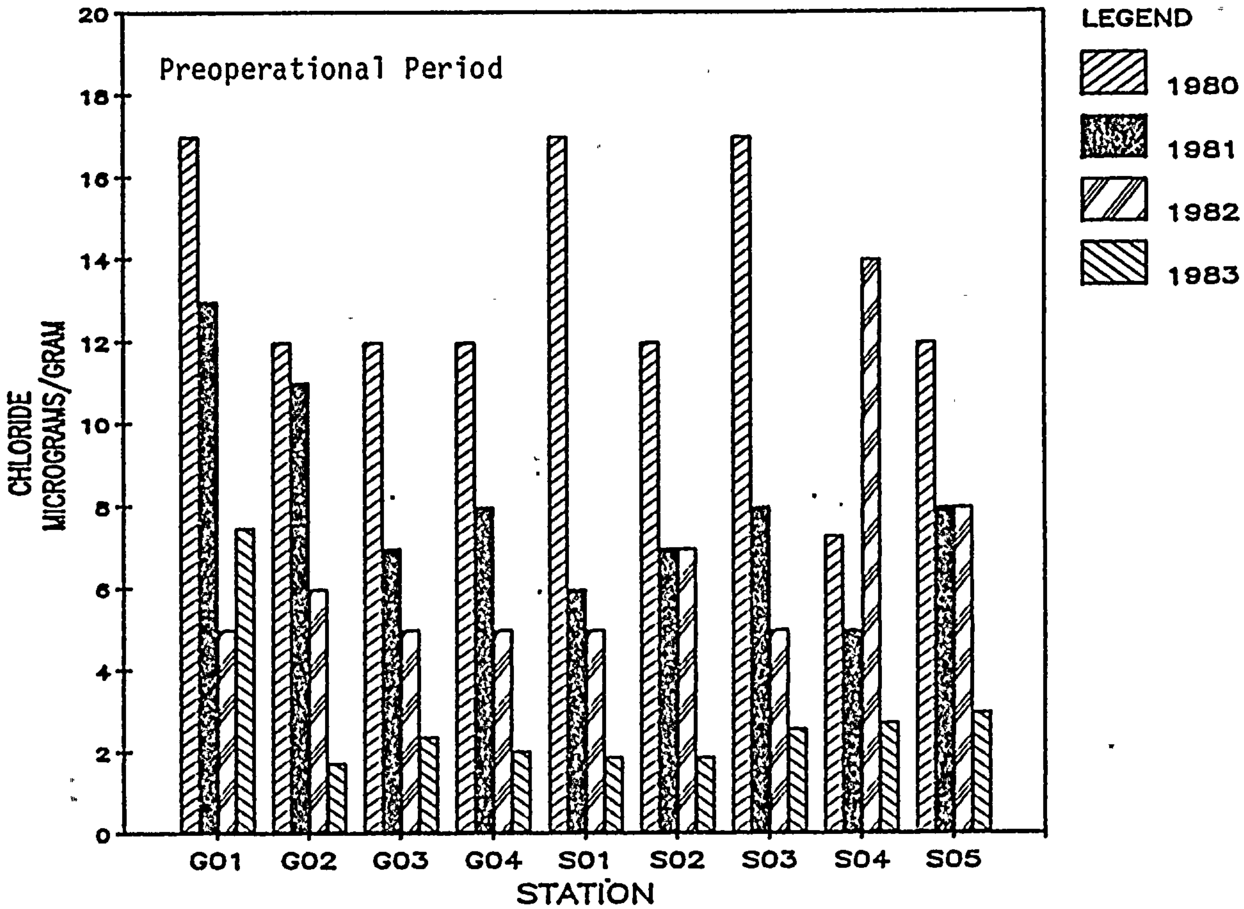




FIGURE 9. SOIL BICARBONATE, 1980-1988



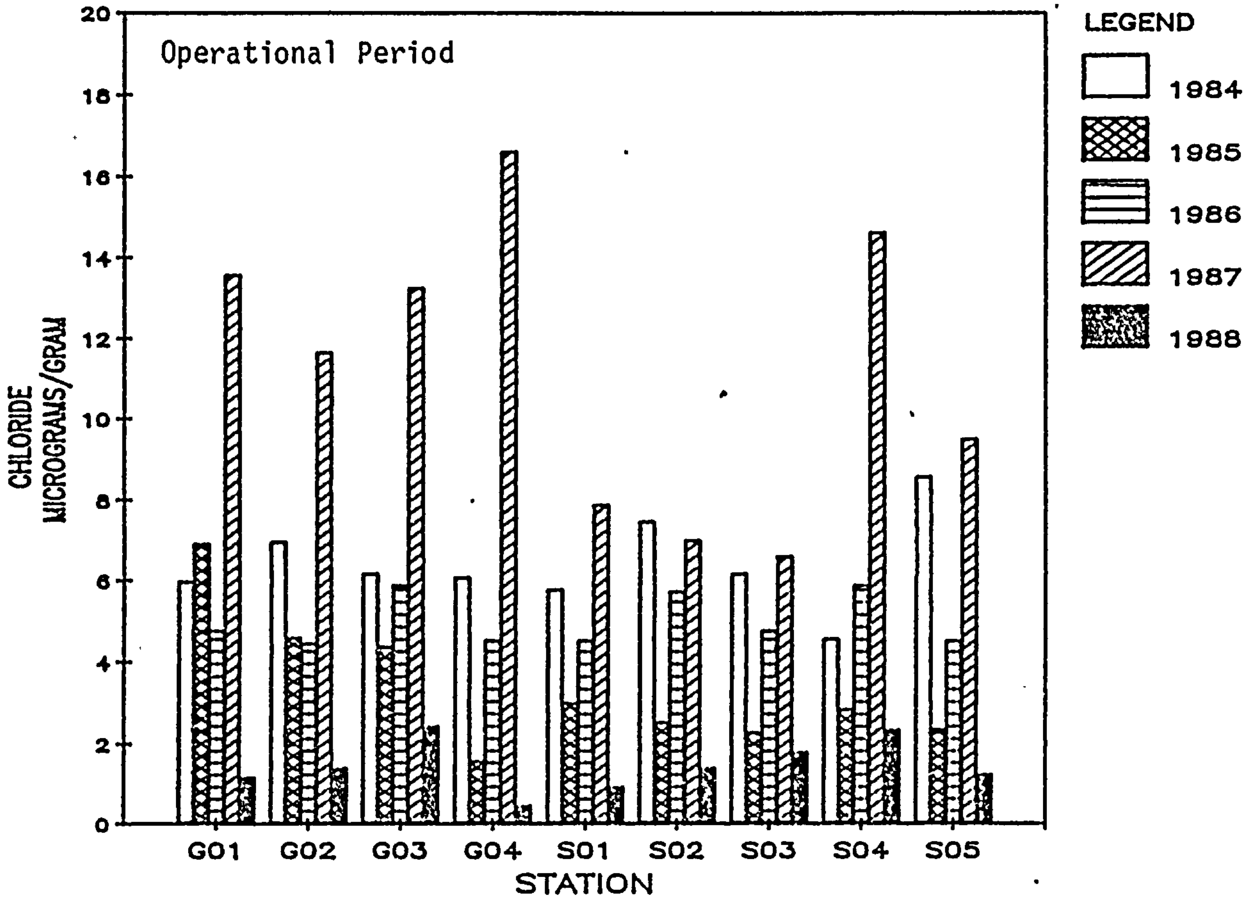




FIGURE 10. SOIL CHLORIDE, 1980-1988

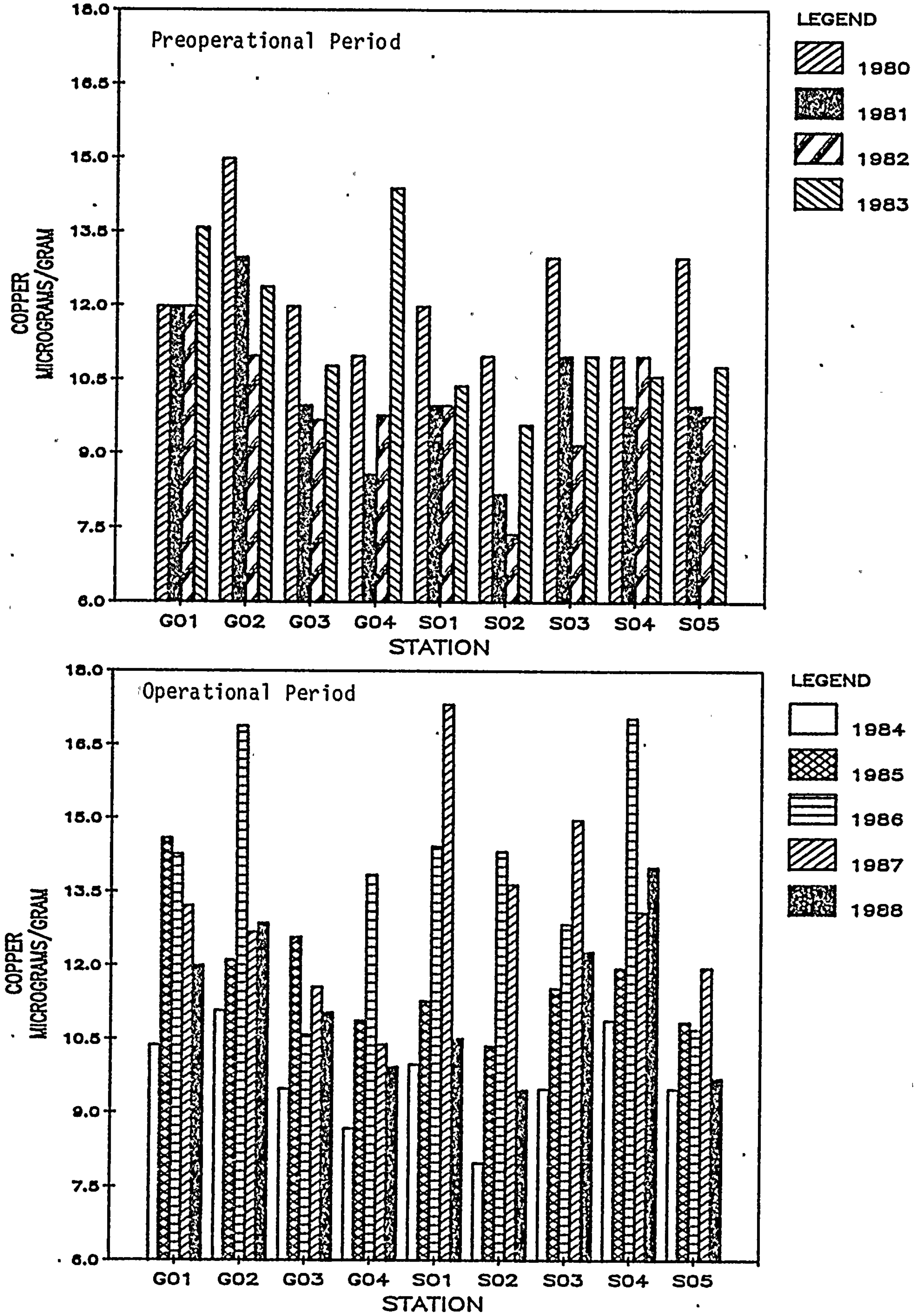



FIGURE 11. SOIL COPPER, 1980-1988

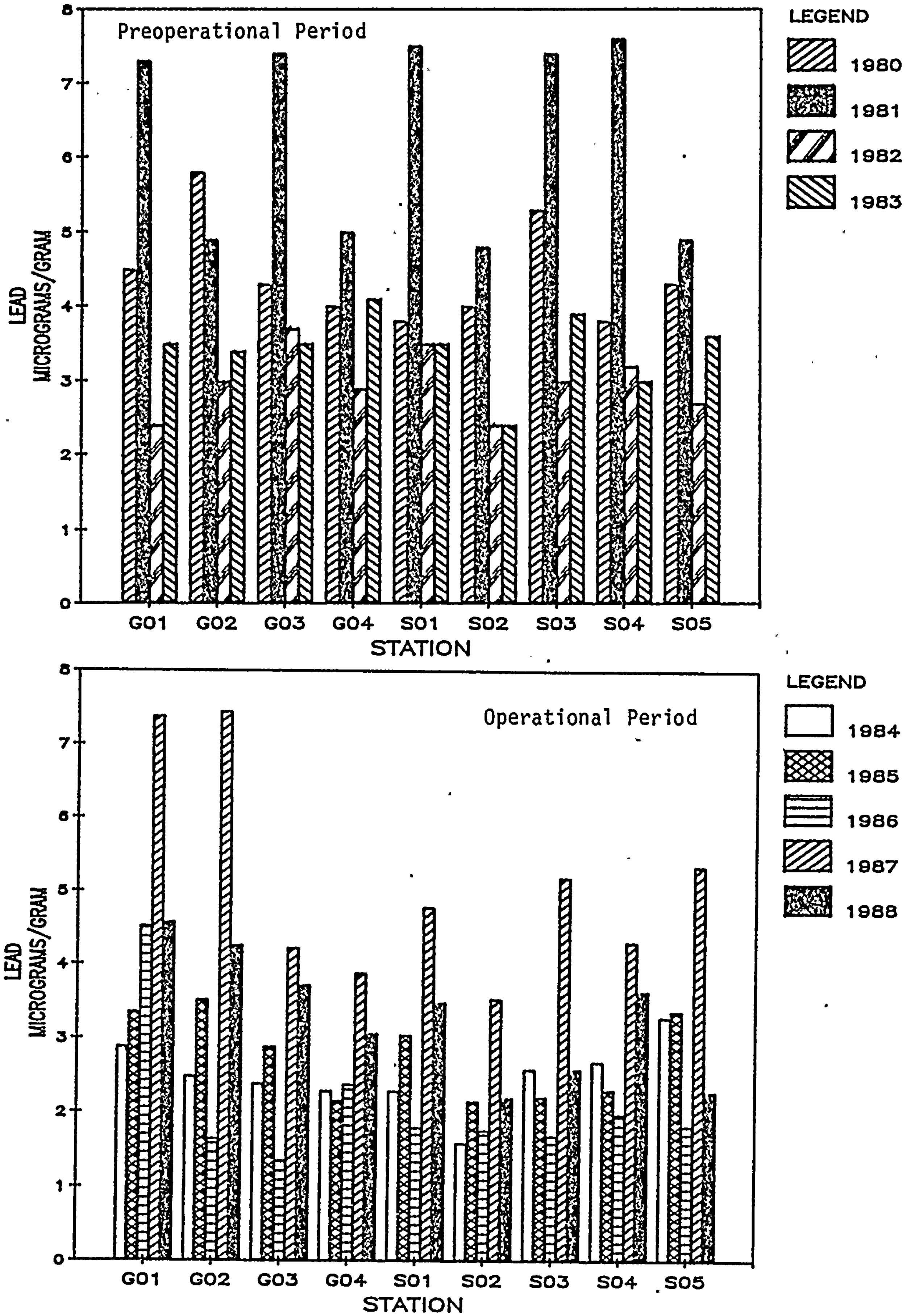



FIGURE 12. SOIL LEAD, 1980-1988

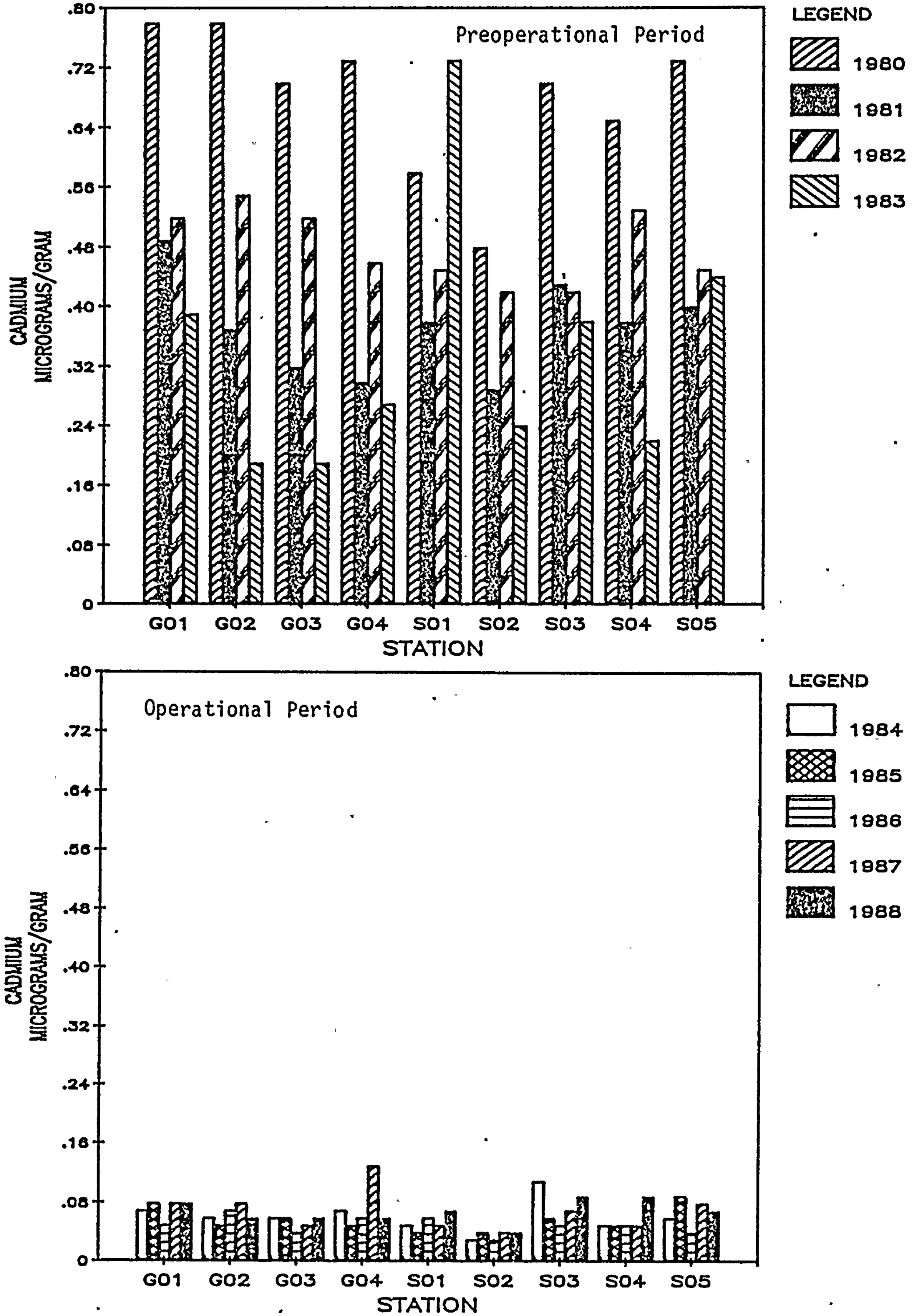



FIGURE 13. SOIL CADMIUM, 1980-1988

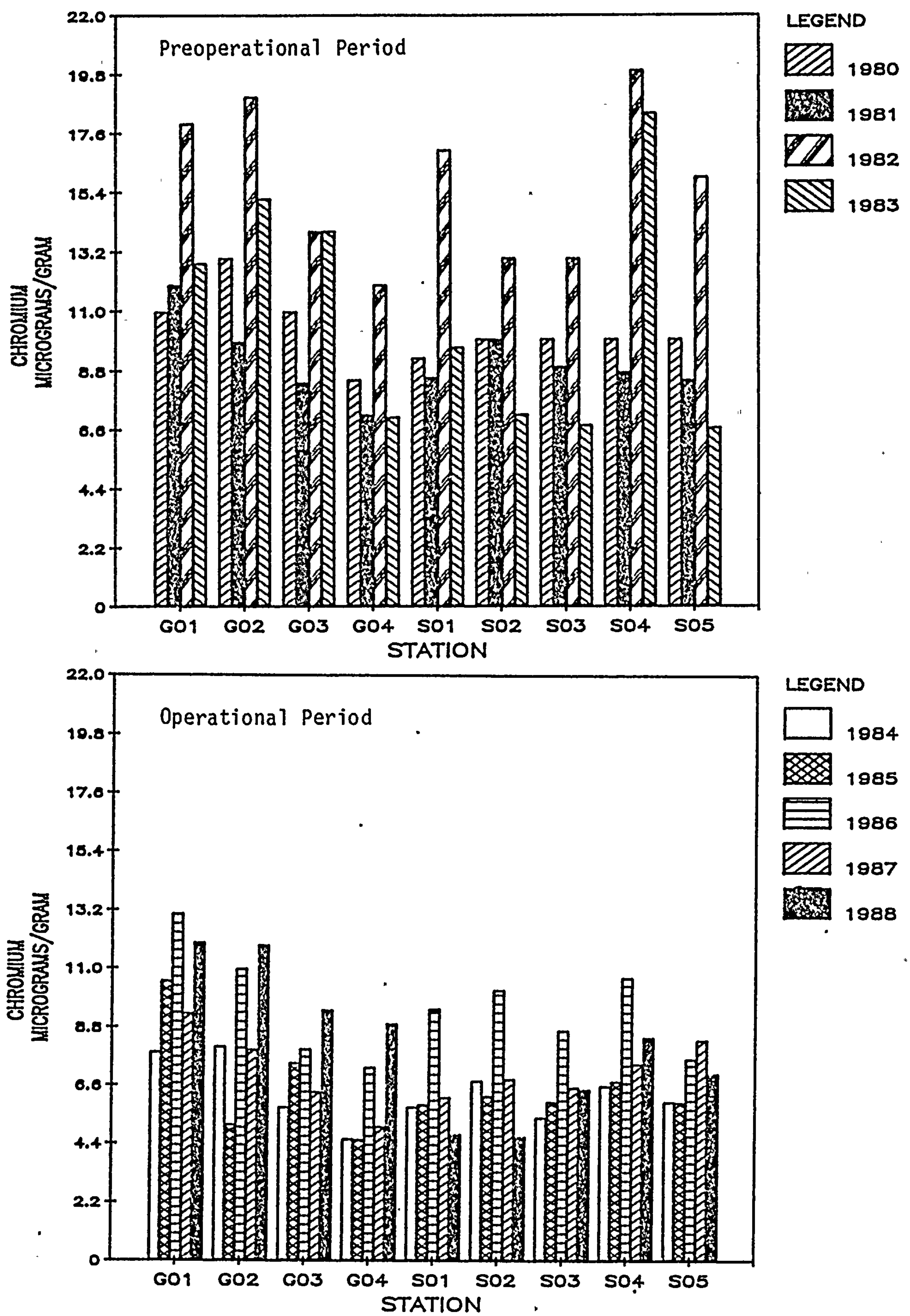



FIGURE 14. SOIL CHROMIUM, 1980-1984

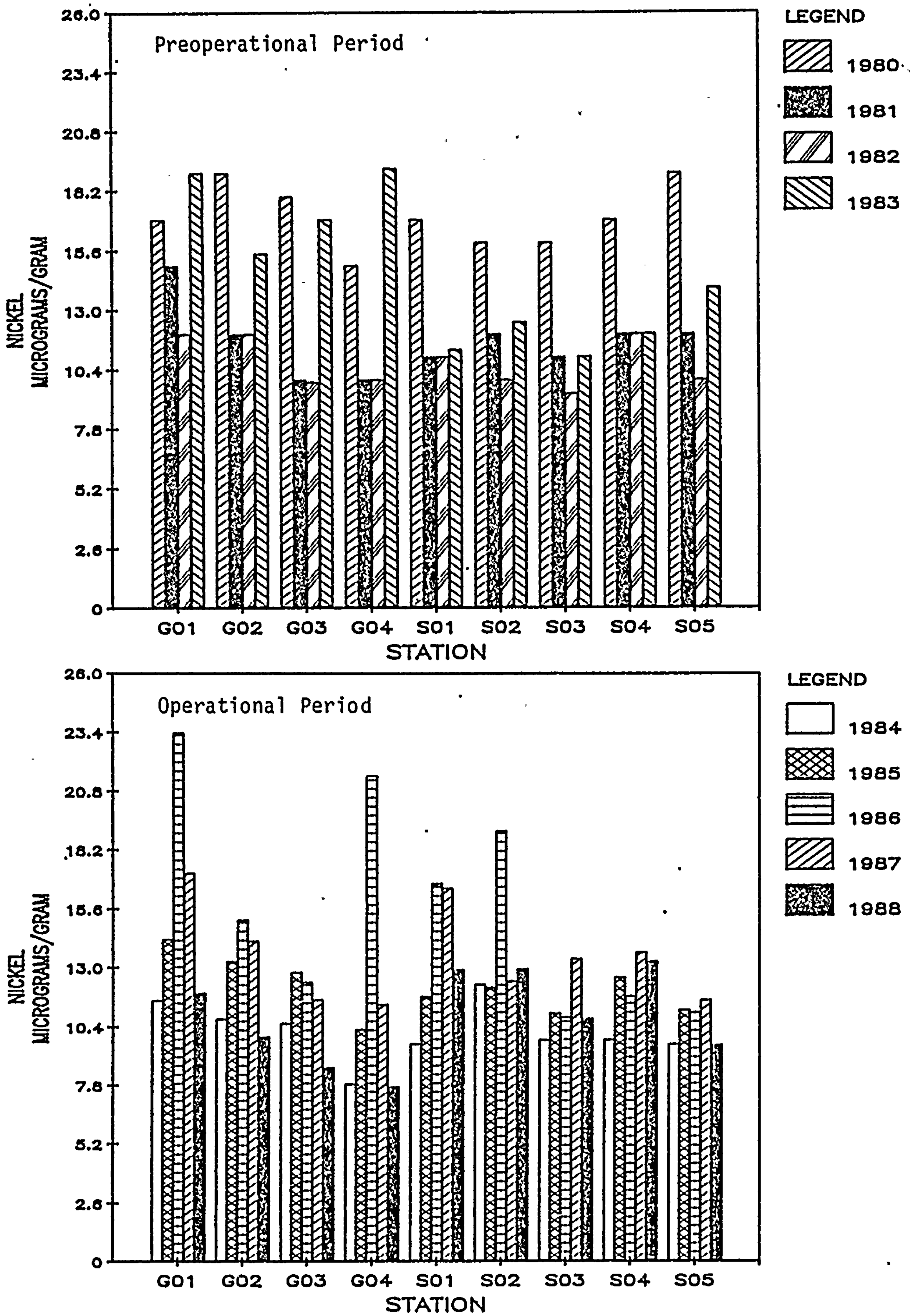



FIGURE 15. SOIL NICKEL, 1980-1988

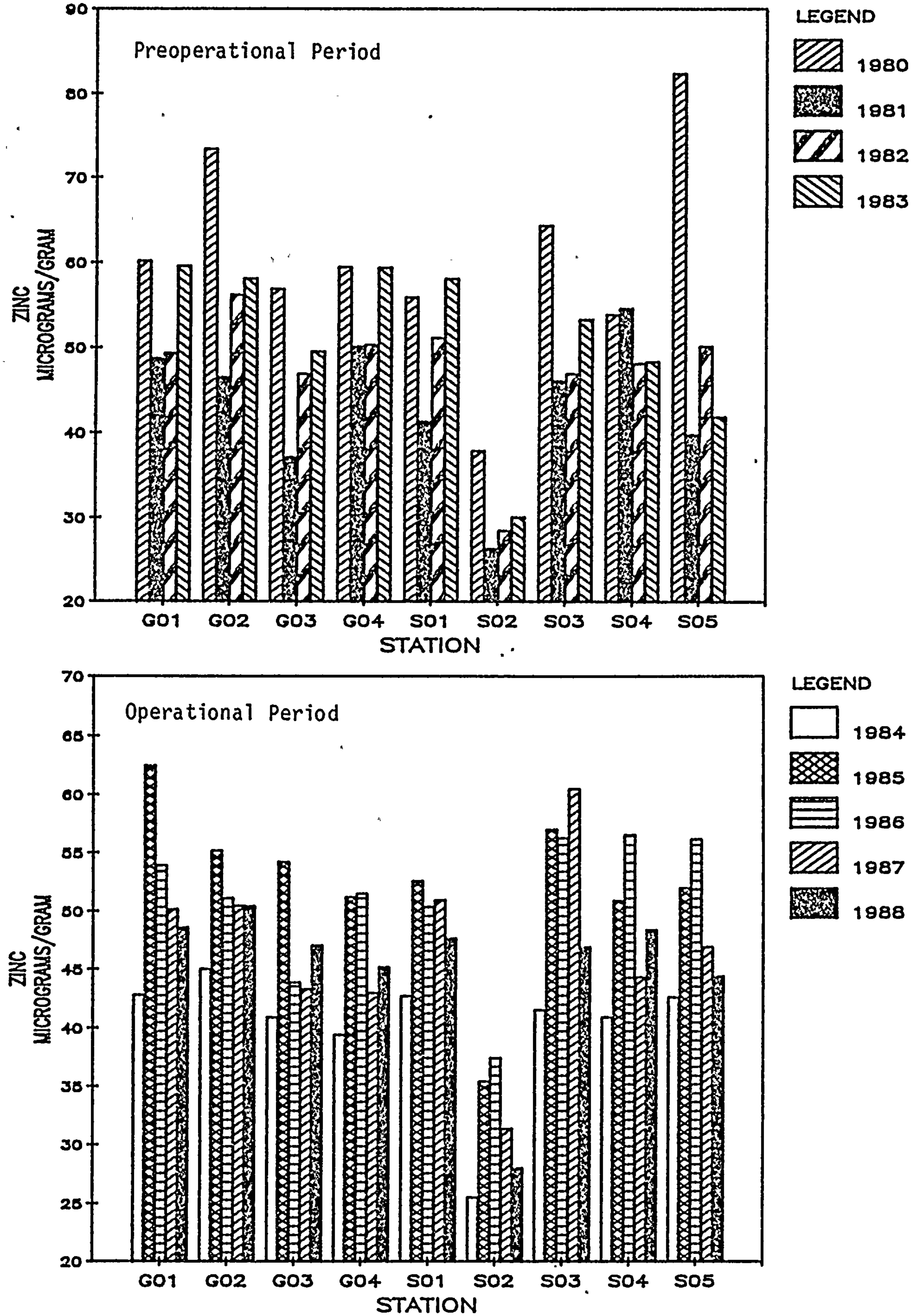
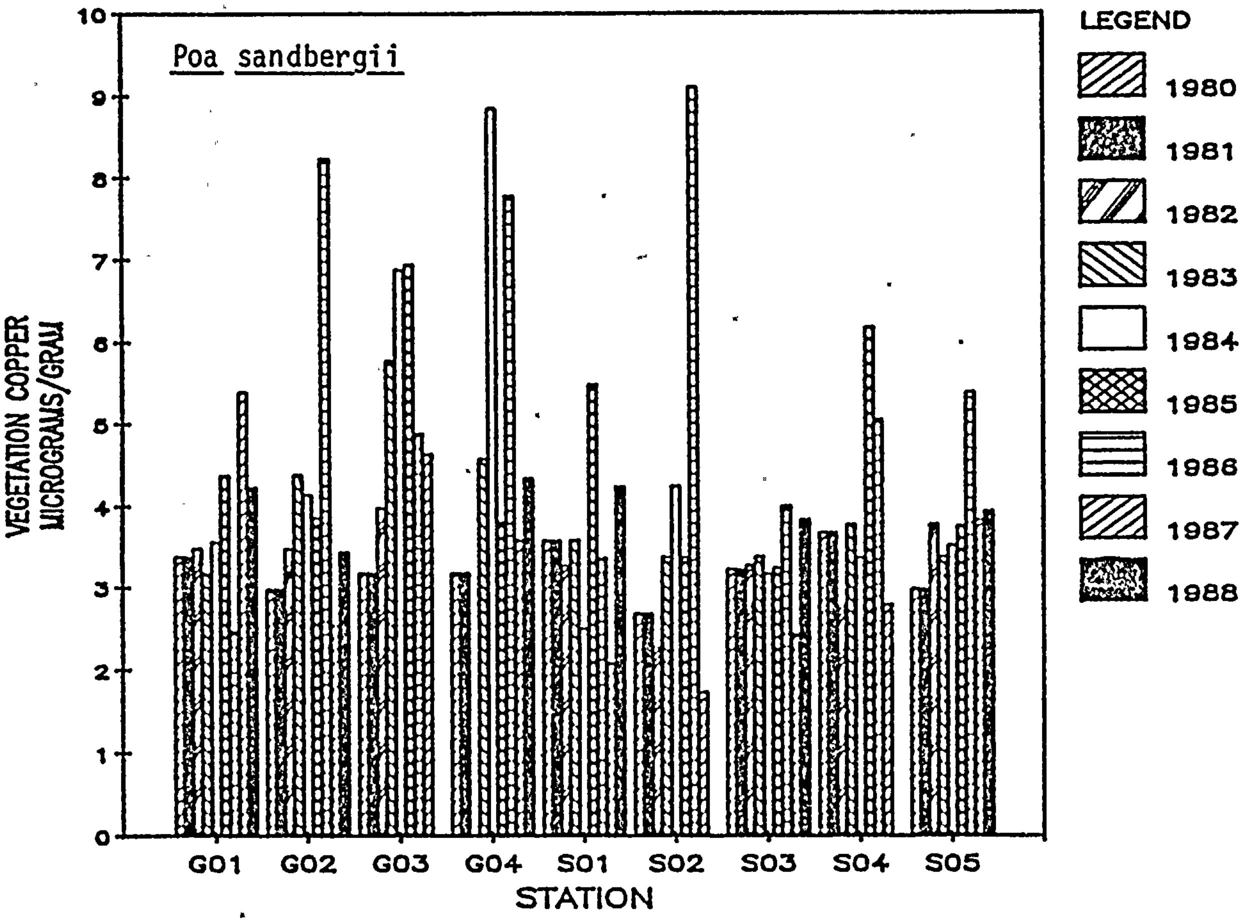



FIGURE 16. SOIL ZINC, 1980-1988



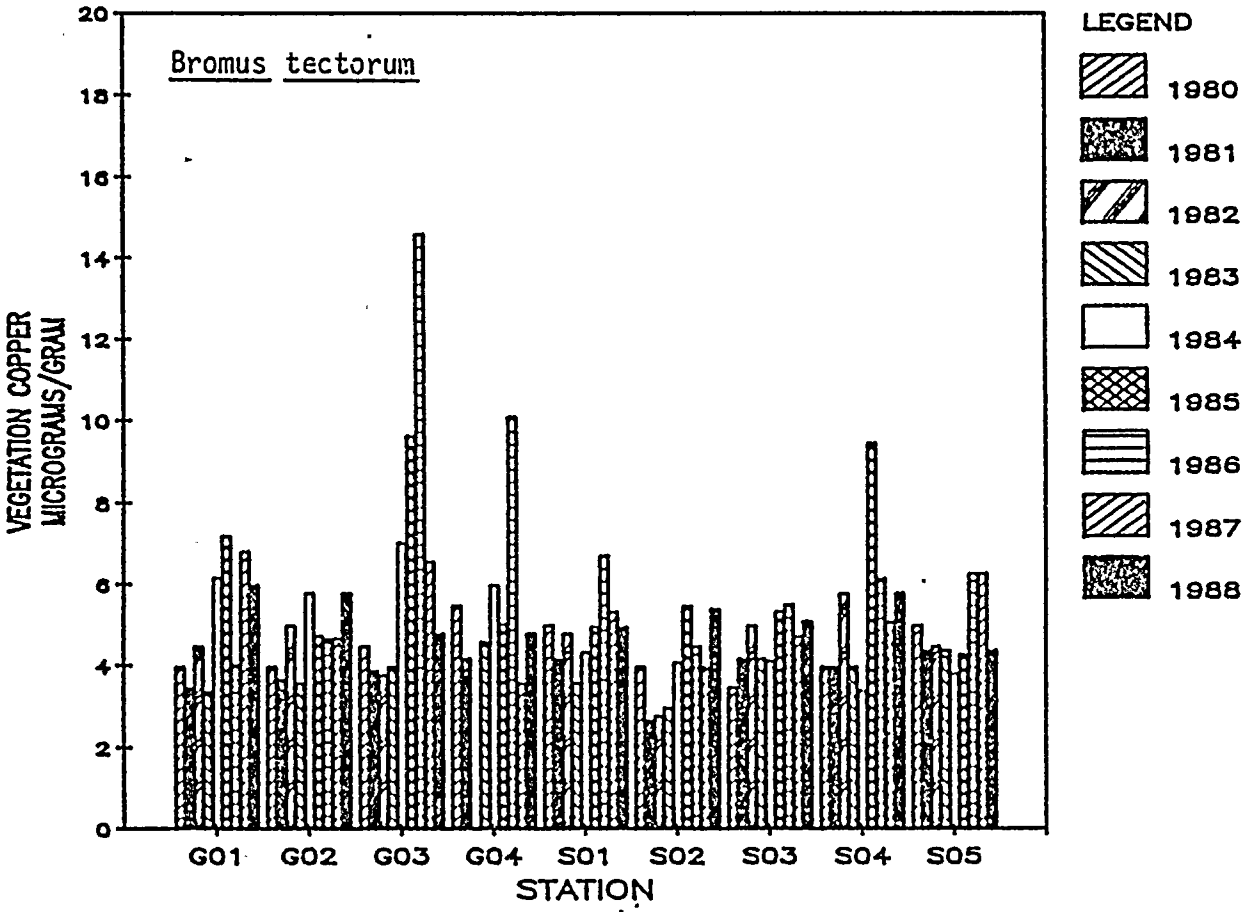
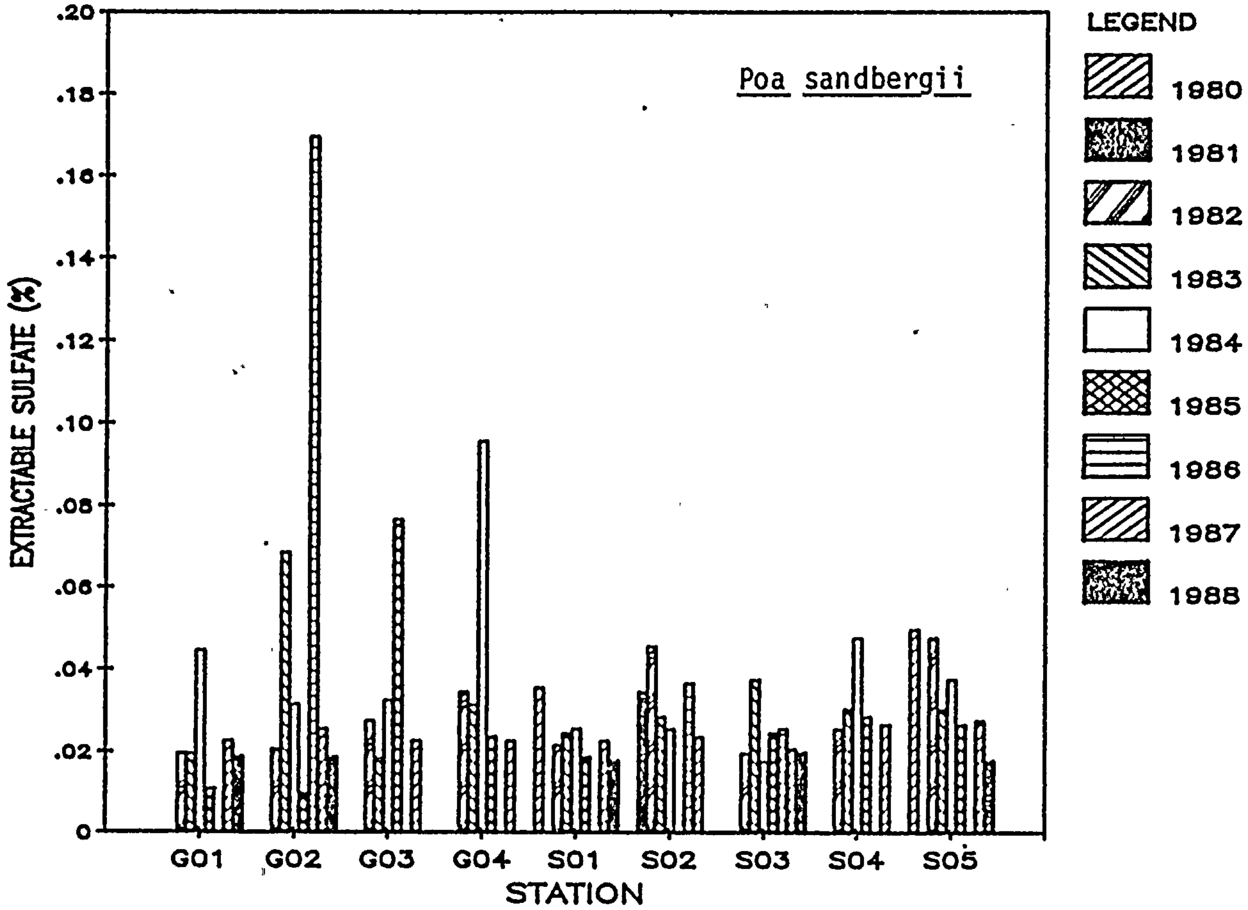




FIGURE 17. COPPER IN VEGETATION, 1980-1988



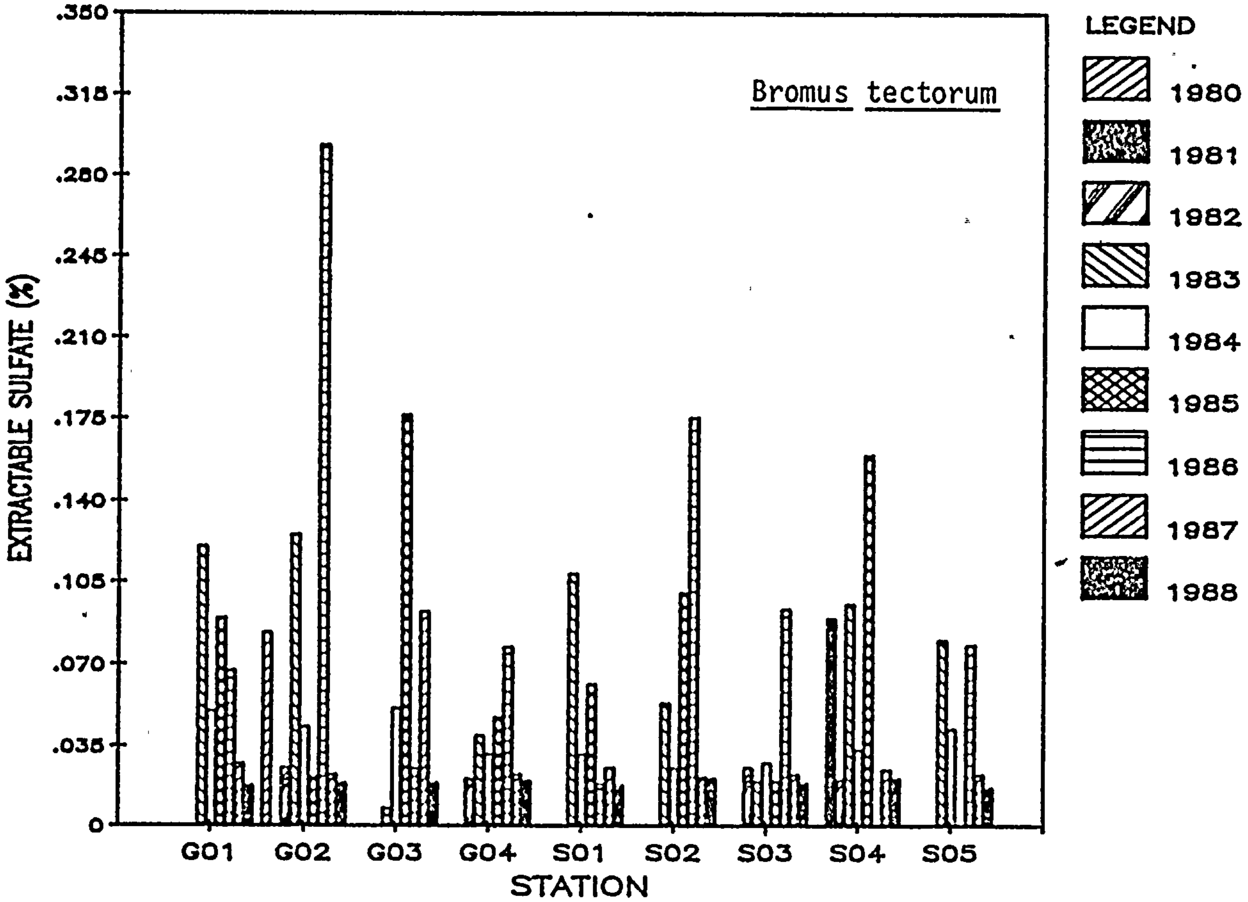
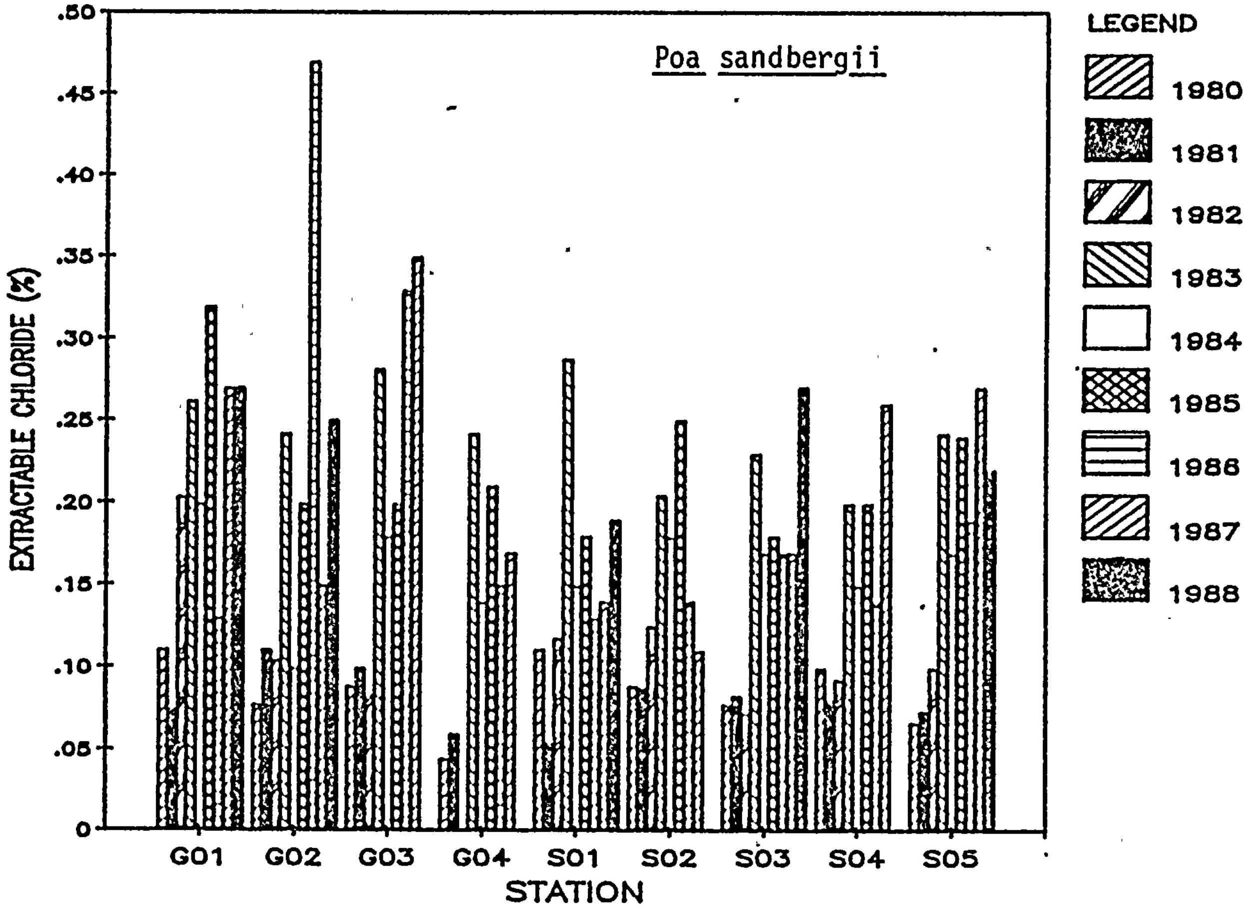




FIGURE 18. SULFATE IN VEGETATION, 1980-1988



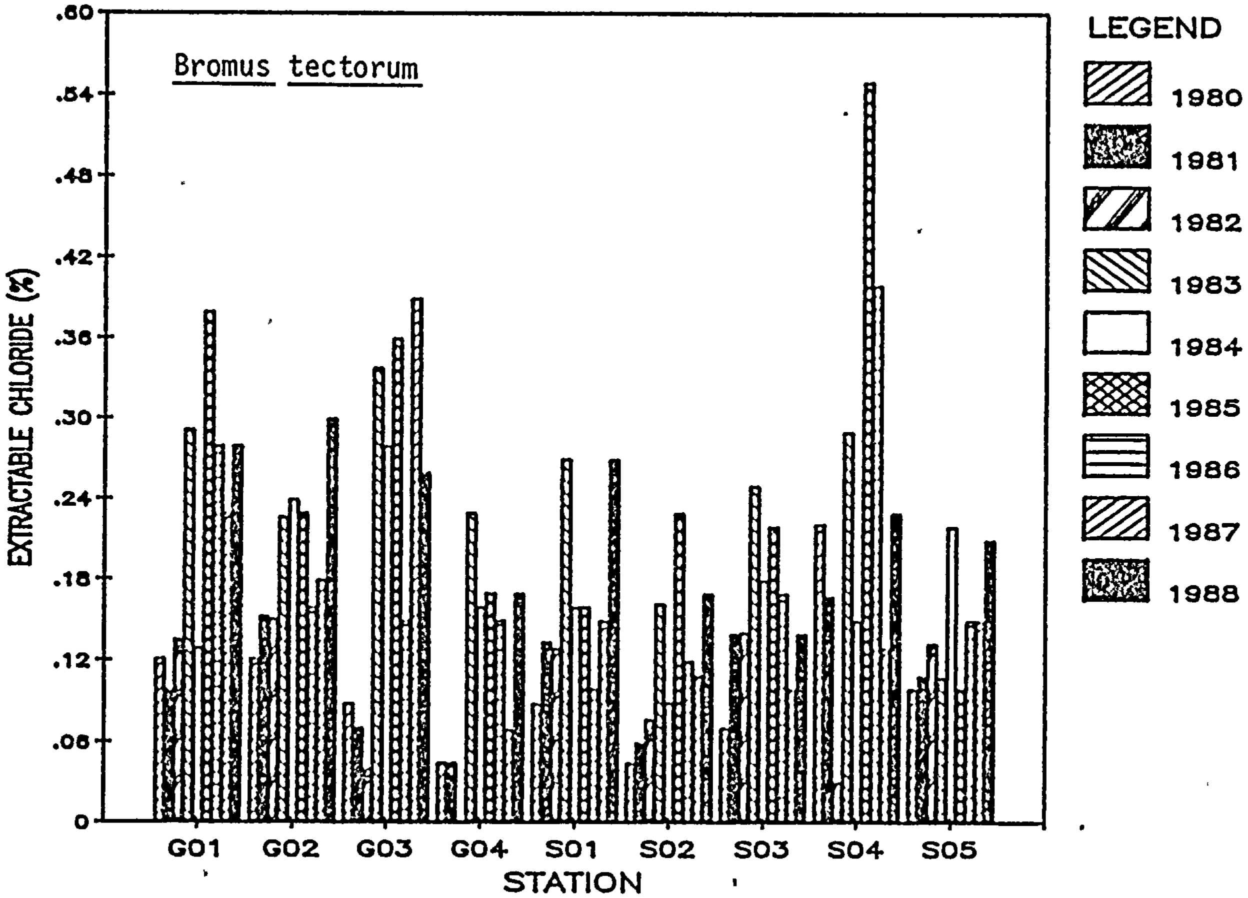




FIGURE 19. CHLORIDE IN VEGETATION, 1980-1988