I N T E R O F F I C E M E M O R A N D U M

Date: 22-Jun-1995 07:44am EST
From: Alvaro Linero TAL
LINERO_A
Dept: Air Resources Management
Tel No: 904/921-9532
SUNCOM: 291-9532

TO: Trudie Bell TAL (BELL_T)

CC: Clair Fancy TAL (FANCY_C)
CC: Cleve Holladay TAL (HOLLADAY_C)
CC: Tom Rogers TAL (ROGERS_T)

Subject: FPC Salt Drift Study

Trudy. Clair Fancy and Tom Rogers assigned me the task of coordinating with you and Buck on this item. I am in charge of PSD/New Source Review.

I think FPC has collected enough data to make any assessments that can be made. They have made their conclusions and these seem more or less in line with their disclosures in the Environmental Impact Statement issued years ago. It seems clear that they recognized and divulged that there would be salt drift and that there would be impacts on sensitive plants.

Overall it is obvious that there is salt drift and the effects are limited to an area within one mile of the facility. FPC would say it is a smaller area and that the effects from cooling towers are not significant compared with natural die-off due to coastal subsidence, higher seawater levels, salt spray, storms, etc.

There is not much that can be done to further mitigate any salt drift impacts from the towers. These were constructed due to the unavailability of groundwater or surface water from Lake Rousseau. They apparently built the first large saltwater cooling towers in the country to meet thermal impact mitigation requirements. The towers were the alternative which preserved available freshwater resources available to other. The trade-off obviously had its consequences which to have been acceptably documented.

For the PSD permit, we (with EPA's concurrence) might be able to to conclude that FPC has satisfied the requirement or that the collection phase is complete. It might not be necessary to modify the PSD permit condition. We would still require a Public Notice. I am aware that FPC has been directed to apply for a Certification change. Let me know if and when we should actually proceed on it.

Call me at 488-1344 if you have any questions.

I N T E R O F F I C E M E M O R A N D U M

Date: 22-Jun-1995 04:18pm EST
From: Alvaro Linero TAL
LINERO_A
Dept: Air Resources Management
Tel No: 904/921-9532
SUNCOM: 291-9532

TO: Trudie Bell TAL (BELL_T)

Subject: FPC Salt Drift Study

Trudie. I agree with you. The Excel data is useful. It can be used to run statistical significance tests to show that a site is different than another or different than the control site or different since the start of the projects. That seems to have been proven already. What could still be done is to explain the differences. A new explanation might be the same or different than FPC's theories. In the worst case even if the entire impacts were due to FPC very little could be done except to document the changes as they have done.

If they actually have to pay a fee to change the certification, it might then be useful to give them some "value-added" work like conducting a full fledged analysis or getting help from a university.

I would be more interested in continuing this effort if it included acid deposition, metals analysis, etc.

I'll wait for the next instruction from Buck.

Florida Power
CORPORATION

RECEIVED
JUN 1 1995
Bureau of
Air Regulation

6/14
Get with Buck on this & try to decide what you would recommend me do. Thanks.
Clm

May 24, 1995

Mr. Hamilton S. Oven, Jr.
Florida Department of Environmental Protection
Douglas Building, Room 953AA
2900 Commonwealth Blvd., MS 48
Tallahassee, FL 32399-3000

Dear Mr. Oven:

Re: Crystal River Salt Drift Study
Permit Number PSD-FL-007

Enclosed is the Annual Report of the Crystal River Salt Drift Study 1993-1994 study year, the 13th year of the study. As noted in the conclusions, the vegetation generally continued to be in good condition. Accordingly, Florida Power again formally requests that DEP approve the discontinuation of the Crystal River salt drift study.

Florida Power Corporation (FPC) has been conducting this salt drift deposition study since 1981 to assess the effects of the two natural draft cooling towers which serve Units 4 and 5 at FPC's Crystal River plant. In addition, the study has, for the past two years, been used to determine whether any vegetation damage is occurring due to salt deposition from the new mechanical helper cooling towers for Units 1, 2, and 3.

The study, originally a part of the NPDES permit and the Site Certification for Units 4 and 5, was incorporated into the PSD permit referenced above on November 30, 1988. Condition 5.c. contains language regarding changes to the monitoring program, which includes the following:

> *Should the data indicate that no significant impacts are occurring to the surrounding area, the permittee, after consultation with and approval by the Director of the EPA Region IV Air, Pesticides, and Toxics Management Division and FDER, may reduce or eliminate the monitoring program.*

In past correspondence and at a November 2, 1994, meeting in Crystal River, FPC has presented its rationale for stopping the study. However, since FPC has not been allowed to end the study, and in response to questions that have been asked, FPC offers the following information that gives additional reasons and documentation to support the request to end the salt drift study. Discussed are a June 1988 deposition modeling study for the Crystal River cooling towers by KBN Engineering, the results and subsequent ending of a three-year salt drift study for the St. Johns River Power Park, and the questionable scientific validity of such studies.

KBN Study

In 1988, as part of the permitting effort for the helper cooling towers, KBN Engineering performed a detailed deposition modeling analysis to assess the total effects of the two natural draft cooling towers for Units 4 and 5 and the four mechanical draft helper cooling towers for Units 1, 2, and 3. The enclosed Figure 3-2, which is from that KBN report, shows the total predicted salt deposition during the summer months resulting from permitted levels of salt drift from the natural draft and helper cooling towers. The summer season was modeled because the helper cooling towers do not operate from November through April.

The maximum total combined deposition over a naturally vegetated area was predicted to occur near the helper cooling towers, and was approximately 400 g/m^2. The vegetation in this area is mainly comprised of salt marsh, which is very tolerant of atmospheric salt deposition. The predicted deposition levels fall rapidly with distance from the helper cooling towers to a level of approximately 10 g/m^2 at the north property line. Sections 3 and 4 from the KBN report, which discuss the modeling analysis, are also enclosed.

Actual deposition levels are likely much lower than those predicted by the conservative modeling analysis. The drift rate measured from the helper cooling towers was at 8% of the permitted level during the most recent stack test. Indeed the salt deposition at the Open Hammock site, the closest monitoring site to the helper cooling towers, was measured during the 1993-1994 study year to be about 146 kg/ha (14.6 g/m^2, Figure 4-1). In addition, the amount of salt collected at this site during the months that the helper towers were operating was not significantly different than the amount collected during the months when the towers were not operating.

St. Johns River Power Park Study

A salt deposition study was conducted by the Jacksonville Electric Authority and Florida Power and Light to assess the effects of the salt drift from the cooling towers for two 600 MW coal-fired steam electric units at the St. Johns River Power Park (SJRPP). The study period was from February 1986 through September 1989. The study began prior to the operation of the first cooling tower and continued for 18 months after the second tower began operation. As with the Crystal River study, the SJRPP study involved the collection of deposition samples at multiple sites combined with a photographic record of the vegetative effects in the surrounding area.

The SJRPP study found no salt-related injury to the vegetation on or surrounding the plant site. The study was concluded after only 18 months of data were obtained while both cooling towers were in operation.

Scientific Validity

The scientific value of salt deposition studies in coastal areas is questionable. The salt drift from power plant cooling towers is only one variable in a complex system. At the Crystal River plant, natural deposition of salt from the Gulf of Mexico, coastal vegetative dieback from sea level rise, and damage due to disease confound the study results and subsequent data interpretation.

Natural deposition may be quite large from coastal storms. For example, the March 1993 storm deposited such a massive amount of salt on the coastal vegetation that it dwarfs the amount of salt deposited by the operation of the cooling towers. Also, some damage and dieback are occurring along the immediate coastline from the slow sea level rise that is taking place along the west coast of Florida. This coastal dieback is not confined to the Crystal River area, but is occurring along a large portion of the coastline.

Conclusion

FPC, for the following reasons, which have been discussed above, requests that the Crystal River salt drift study be terminated:

- No significant impacts are occurring to the area surrounding the Crystal River plant from the operation of the cooling towers. The study has recorded the effects of the Units 4 and 5 natural draft cooling towers since its inception in 1981. In addition, two full operating seasons of the helper cooling towers have been added to the study results.
- A KBN modeling study showed minimal deposition off FPC plant property from the permitted levels of salt drift. Actual drift is a fraction of the permitted amount.
- The SJRPP study yielded results similar to the Crystal River study, and it was terminated after 18 months of data from both cooling towers.
- The scientific value of the study is limited, and given the 13 year length of the Crystal River study, it has reached its limit in terms of providing additional meaningful data.

Termination of the study would be effective immediately upon approval.

Thank you for your consideration of this request. Please contact David Voigts at (813) 866-5166 or Mike Kennedy at (813) 866-4344 if you have any questions or if you need additional information.

Sincerely,

W. Jeffrey Pardue, C.E.P.
Director

Enclosures

cc: EPA Region IV
Ms. Marilyn Polson, Esq.
Mr. Clair Fancy, DEP - Tallahassee

cc: Buck Oven
Bill Thomas, SWD

Department of Environmental Protection

Lawton Chiles
Governor

Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Virginia B. Wetherell
Secretary

June 9, 1995

Mr. W. Jeffrey Pardue, Director
Environmental Services Department H2G
Post Office Box 14042
St. Petersburg, Florida 33733

Re: Crystal River Salt Drift Study, PA 77-09

Dear Mr. Pardue:

The Department is considering your request to terminate the salt drift monitoring program as discussed in your letter of May 24, 1995. Your request may be sufficient for the Bureau of Air regulation to initiate a revision to the Permit numbered PSD-FL-007. Your letter of request is not sufficient to initiate a modification of the conditions of certification. You should request in writing deletion of Condition of Certification I.B.7. The petition for modification must be accompanied by the $10,000.00 modification fee.

Sincerely,

Hamilton S. Oven

Hamilton S. Oven, P.E.
Administrator, Siting
Coordination Office

cc: Chip Collette
Trudie Bell
Clair Fancy

Department of
Environmental Protection

Southwest District
3804 Coconut Palm Drive
Tampa, Florida 33619

Lawton Chiles
Governor

Virginia B. Wetherell
Secretary

May 18, 1995

RECEIVED
MAY 2 2 1995
Environmental Svcs
Department

Mr. W. Jeffrey Pardue, C.E.P.
Director
Environmental Services Department
Florida Power Corporation
P. O. Box 14042
St. Petersburg, Florida 33733

Re: Sulfur Dioxide Compliance Testing - Crystal River Units 4 and 5

Dear Mr. Pardue:

After a thorough review of permit files in our office and in Tallahassee, we also were unable to locate any documentation which addressed using a fuel sulfur analysis in lieu of an actual stack test. However, the Air Program Information System source pollutant record screens for these units indicate no SO2 test is required. These screens do not indicate the source of this determination.

To resolve this issue, we concur with the suggestion in your letter dated January 13, 1995, to request a Site Certification amendment to delete the requirement to conduct an annual test for SO2 and to use the continuous emissions monitors to demonstrate compliance. In addition, your amendment application should propose replacing the reference to a 1975 DER document in Paragraph I.C.2. with specific test methods from 40 CFR 60, Appendix A.

Thank you for your cooperation in resolving this issue. Please send courtesy a copy of any amendment application and subsequent outgoing correspondence to the DEP Southwest District Air Program.

Sincerely,

W. A. Proses

W. A. Proses
Air Compliance Supervisor

cc: Clair Fancy, BAR
Hamilton Oven, OSEC

Florida Department of

Memorandum **Environmental Protection**

RECEIVED

APR 7, 1995

Division of Air Resources Management

To: Tom Rogers, Environmental Administrator
Division of Air Resource Management

From: Trudie D. Bell, Environmental Specialist III TDB
Siting Coordination Office/Bureau of Submerged Lands
and Environmental Resources

Date: April 6, 1995

Subject: PA77-09, Florida Power Corporation
Crystal River Power Plant

The certification for the Crystal River plant requires that Florida Power Corporation (FPC) perform a salt drift study to monitor any increase in salt deposition on the area surrounding the plant. The study was required because of concerns by the neighboring landowners that the cooling towers on the plant site would increase the salt deposition on adjacent lands. FPC has been monitoring salt drift and submitting reports since 1982. They have indicated informally that they would like to end the study and have submitted a PSD modification request to the Division of Air Management. However, a request to modify the certification with the appropriate fee has not been submitted to the Department. Therefore, the request is still on an informal basis.

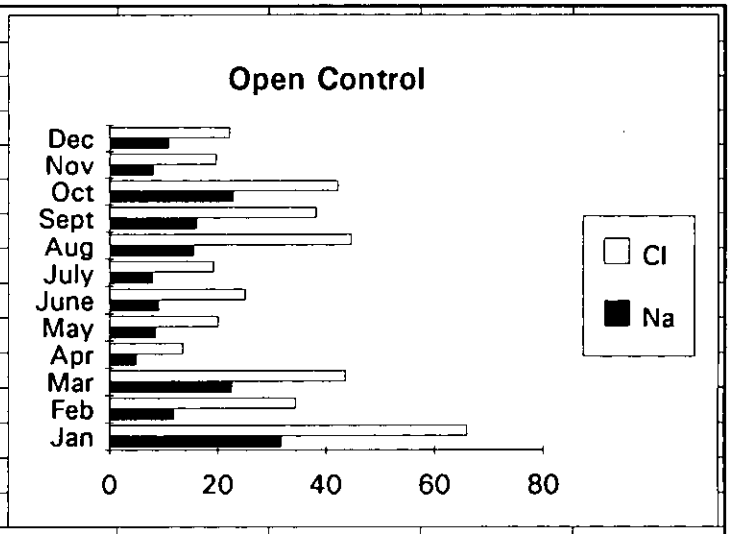
The Siting Coordination Office staff have taken the sodium and chloride deposition data from the study and entered the data into Excel. Accompanying this memo are disks with the data, hard copies of the data and maps showing the location of the sampling sites in relation to the plant for each year.

Please review the data with regards to any applicable meteorological data, that the Division of Air Resource Management has, for evidence of increased salt deposition attributable to the power plant. As was explained above, FPC has not made a formal modification request, so there is no deadline for this review. If there is any other information that would be useful, or if you have questions, I can be reached at 921-9886.

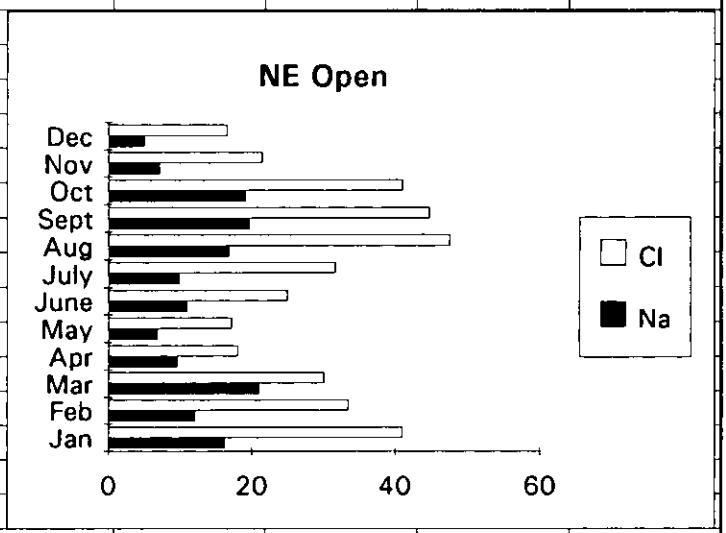
TDB/tb

cc: Buck Oven, Siting Coordination Office (w/o enc)
Al Linero, Division of Air Resource Management (w/o enc)

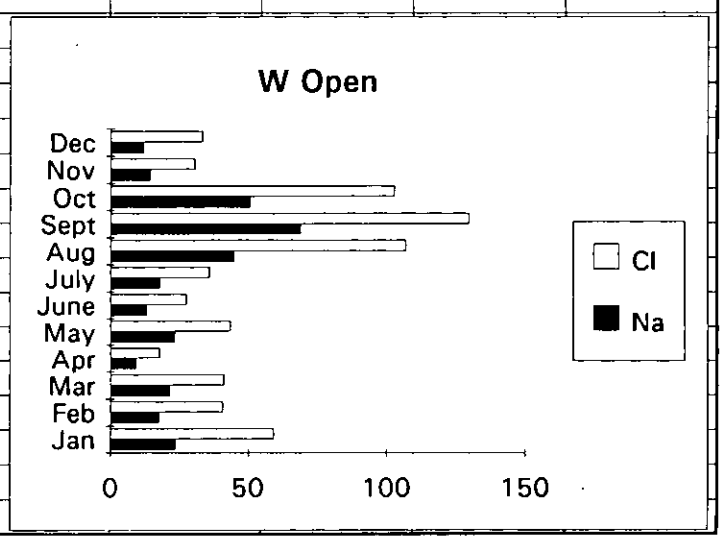
Open Control		
	Na	Cl
Jan	31.93	65.96
Feb	12.06	34.47
Mar	22.75	43.72
Apr	5.13	13.72
May	8.64	20.17
June	9.26	25.24
July	8	19.39
Aug	15.64	44.71
Sept	16.29	38.29
Oct	23.02	42.31
Nov	8.13	19.8
Dec	11.04	22.24



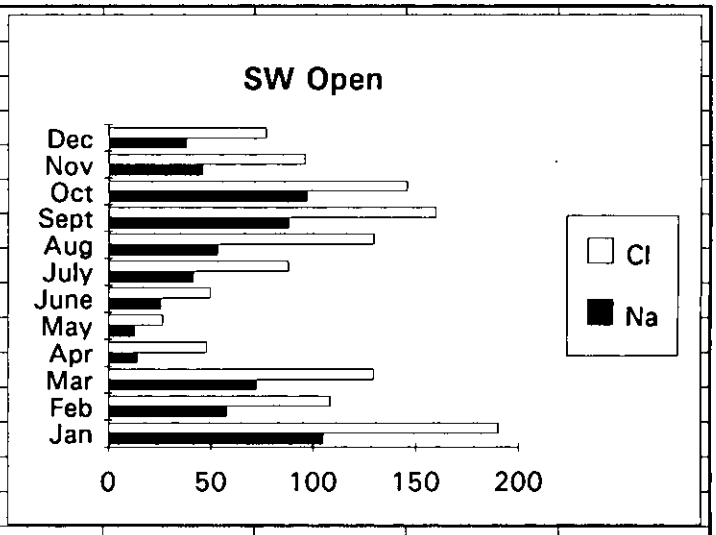
NE Open		
	Na	Cl
Jan	16.4	41.01
Feb	12.14	33.47
Mar	21.04	30.09
Apr	9.7	18.16
May	6.97	17.26
June	11.07	25.06
July	9.99	31.67
Aug	16.86	47.58
Sept	19.68	44.79
Oct	19.2	41.01
Nov	7.24	21.5
Dec	5.1	16.6



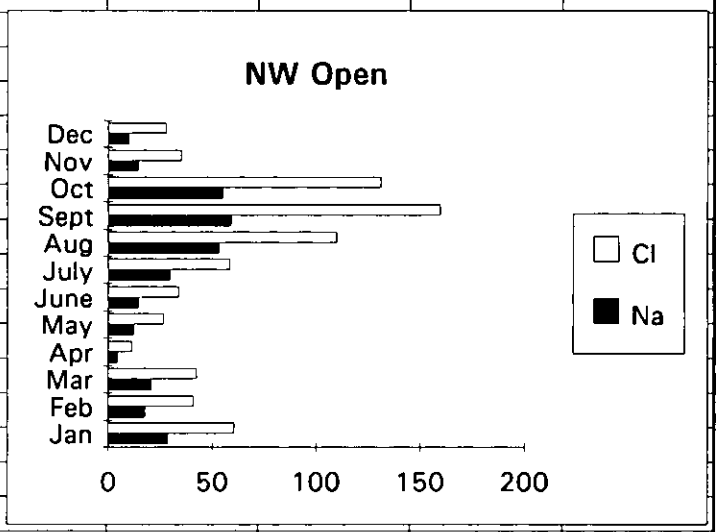
W Open		
	Na	Cl
Jan	23.71	59.37
Feb	17.76	40.78
Mar	21.64	41.32
Apr	9.45	17.99
May	23.48	43.58
June	13.21	27.68
July	18.03	36.08
Aug	44.76	107.09
Sept	69.09	129.96
Oct	50.73	103.06
Nov	14.51	30.65
Dec	12.03	33.6



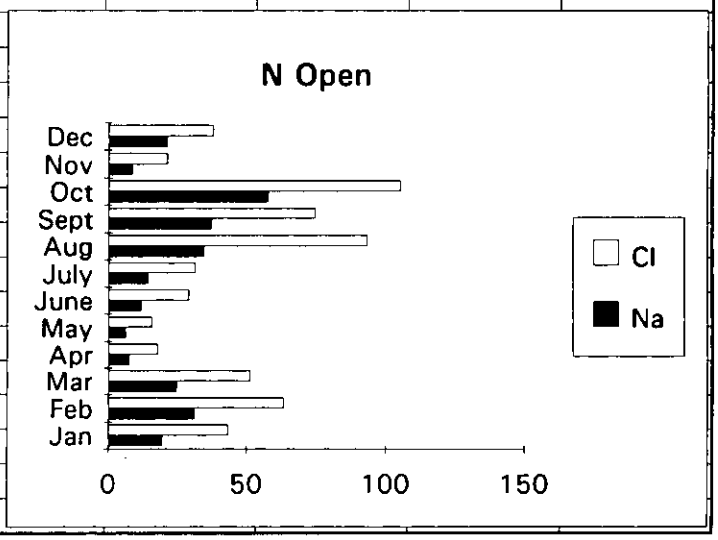
SW Open		
	Na	Cl
Jan	105.19	190.48
Feb	57.86	108.53
Mar	72.59	129.82
Apr	14.39	48.23
May	13.16	26.66
June	25.74	50.22
July	41.76	88.03
Aug	53.5	129.87
Sept	88.33	159.91
Oct	97.07	145.96
Nov	46.08	96.07
Dec	38.24	77.33



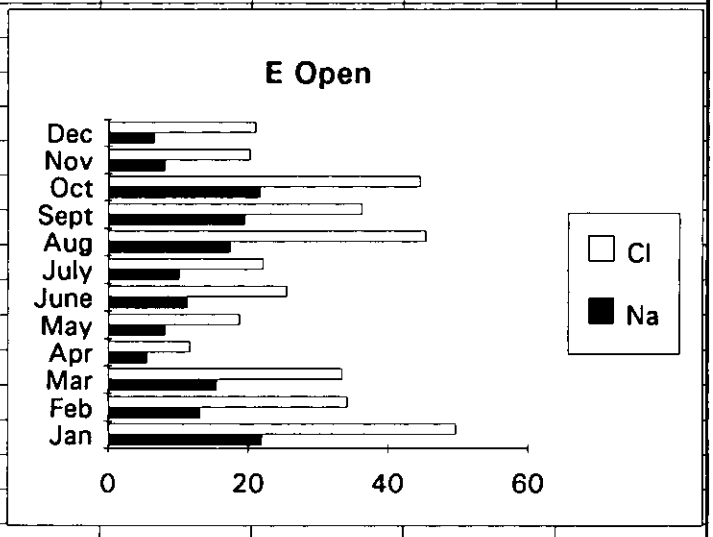
NW Open		
	Na	Cl
Jan	28.86	60.7
Feb	17.92	41.36
Mar	21.04	42.74
Apr	4.79	11.48
May	12.85	26.87
June	14.98	34.05
July	29.9	58.83
Aug	53.5	110.21
Sept	59.39	159.91
Oct	55.26	131.34
Nov	14.45	35.36
Dec	10.45	28.18



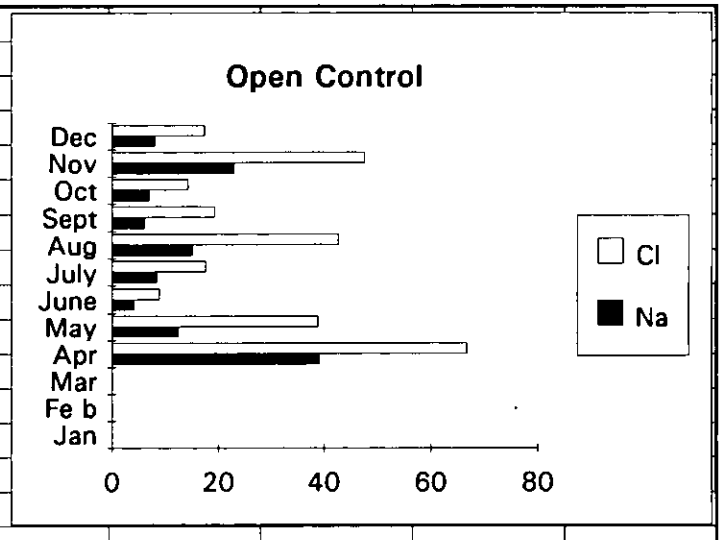
N Open		
	Na	Cl
Jan	19.95	43.64
Feb	31.3	63.58
Mar	24.88	51.45
Apr	7.7	17.91
May	6.55	15.97
June	12.04	29.28
July	14.55	31.67
Aug	34.85	93.65
Sept	37.46	74.79
Oct	58.11	105.57
Nov	8.83	21.5
Dec	21.5	38.15



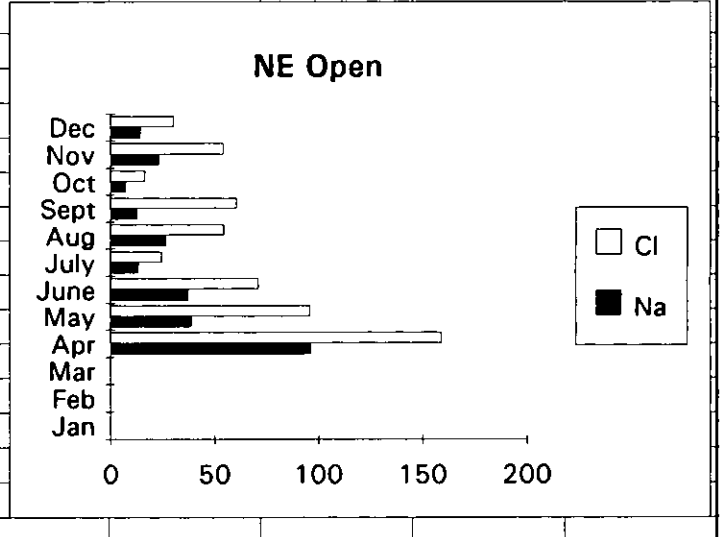
E Open		
	Na	Cl
Jan	22	49.72
Feb	13.2	34.28
Mar	15.58	33.51
Apr	5.62	11.79
May	8.18	18.82
June	11.41	25.56
July	10.17	22.19
Aug	17.51	45.46
Sept	19.6	36.32
Oct	21.77	44.66
Nov	8.19	20.35
Dec	6.62	21.11



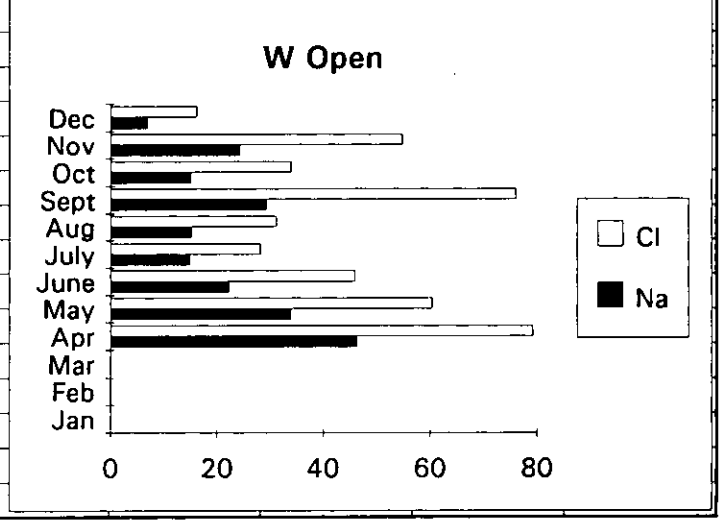
Open Control		
month	Na	Cl
Jan		
Fe b		
Mar		
Apr	39.13	66.85
May	12.55	38.88
June	4.22	9.05
July	8.68	17.77
Aug	15.25	42.71
Sept	6.29	19.45
Oct	7.12	14.41
Nov	23.05	47.7
Dec	8.2	17.5



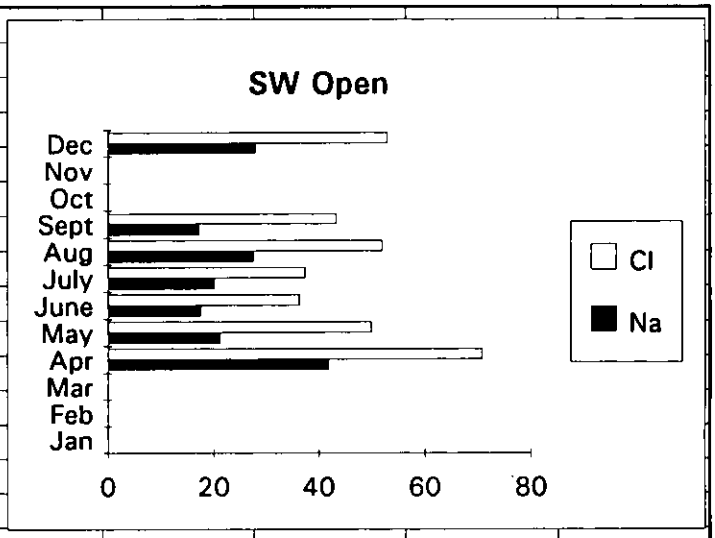
NE Open		
	Na	Cl
Jan		
Feb		
Mar		
Apr	96.28	159.07
May	39.11	96.19
June	37.43	71.15
July	13.8	24.74
Aug	26.89	54.57
Sept	12.82	60.78
Oct	7.52	16.9
Nov	23.51	54.25
Dec	14.6	30.54



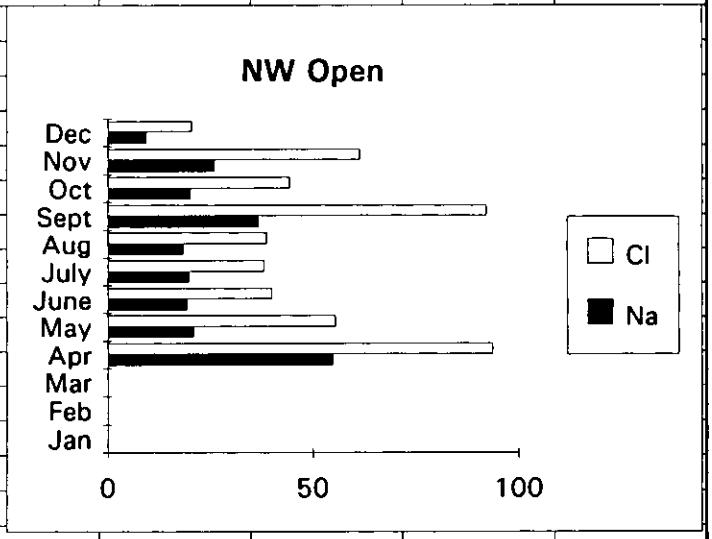
W Open		
	Na	Cl
Jan		
Feb		
Mar		
Apr	46.34	79.35
May	34.1	60.51
June	22.3	45.99
July	15.03	28.34
Aug	15.42	31.24
Sept	29.33	76.22
Oct	15.31	34.07
Nov	24.31	54.91
Dec	7.01	16.33



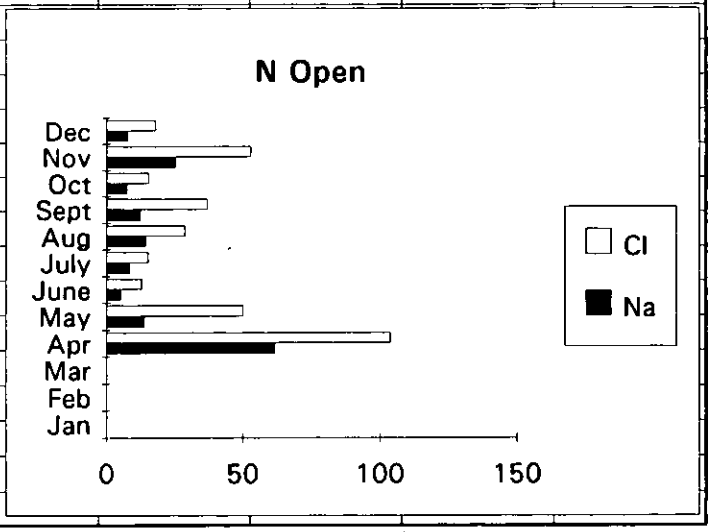
SW Open		
	Na	Cl
Jan		
Feb		
Mar		
Apr	41.87	70.88
May	21.32	50.02
June	17.69	36.39
July	20.33	37.46
Aug	27.63	52
Sept	17.38	43.35
Oct	.	.
Nov	.	.
Dec	28.01	53.01



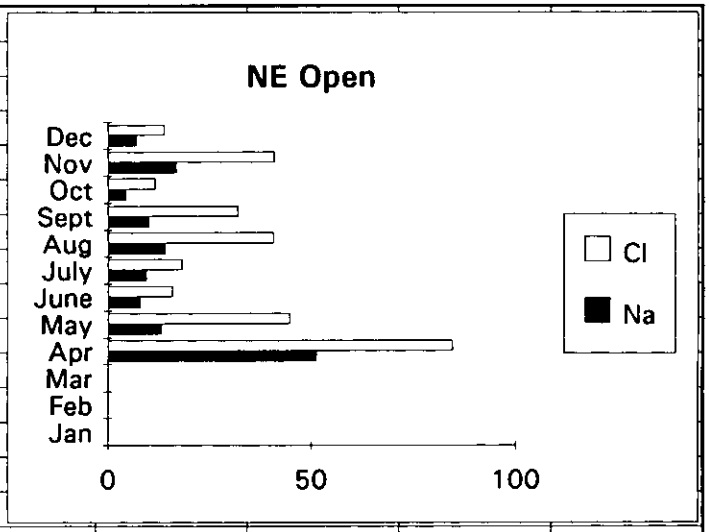
NW Open		
	Na	Cl
Jan		
Feb		
Mar		
Apr	54.97	93.79
May	20.95	55.68
June	19.49	40.14
July	19.94	38.23
Aug	18.67	38.9
Sept	36.79	92.19
Oct	20.23	44.51
Nov	26.18	61.53
Dec	9.48	20.5



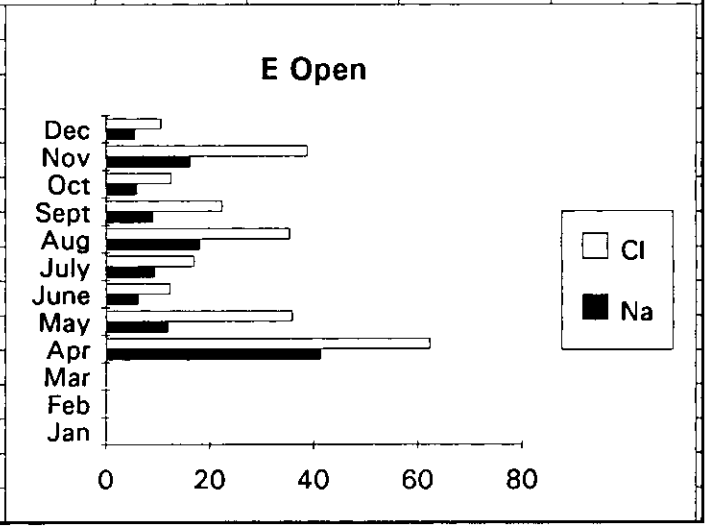
N Open		
	Na	Cl
Jan		
Feb		
Mar		
Apr	61.9	104.11
May	14.1	50.17
June	5.57	13.13
July	8.72	15.53
Aug	14.52	29.05
Sept	12.63	37.15
Oct	7.64	15.62
Nov	25.41	53.07
Dec	8.05	18.17



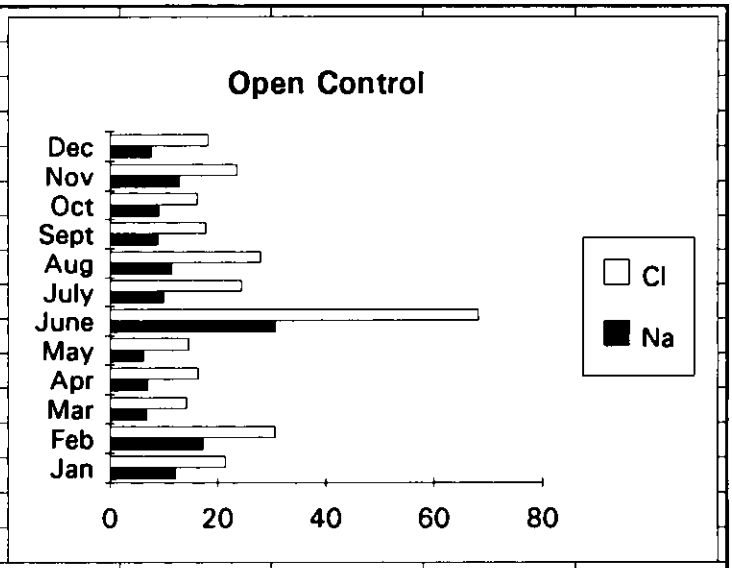
NE Open		
	Na	Cl
Jan		
Feb		
Mar		
Apr	51.39	84.71
May	13.41	44.76
June	8.02	16.03
July	9.64	18.31
Aug	14.34	40.88
Sept	10.17	32.03
Oct	4.63	11.73
Nov	16.92	40.98
Dec	7.12	13.96



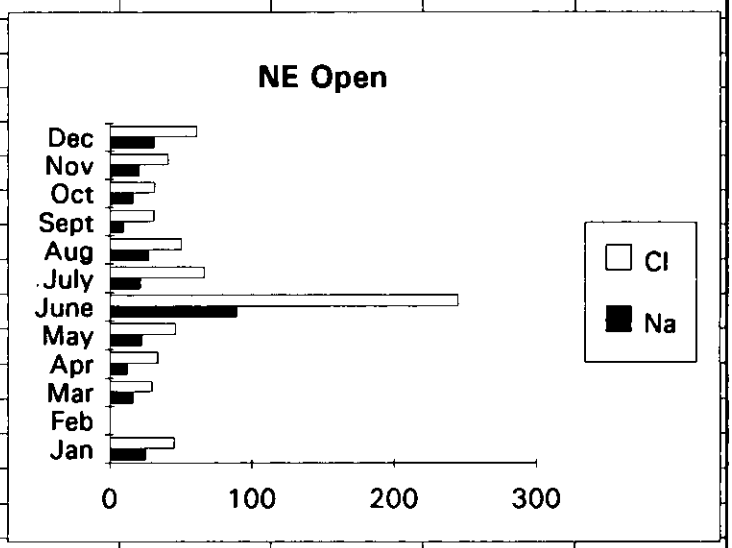
E Open		
	Na	Cl
Jan		
Feb		
Mar		
Apr	41.51	62.53
May	12.05	35.94
June	6.22	12.44
July	9.41	17.03
Aug	18.15	35.54
Sept	9.13	22.53
Oct	6	12.64
Nov	16.28	38.89
Dec	5.66	10.64



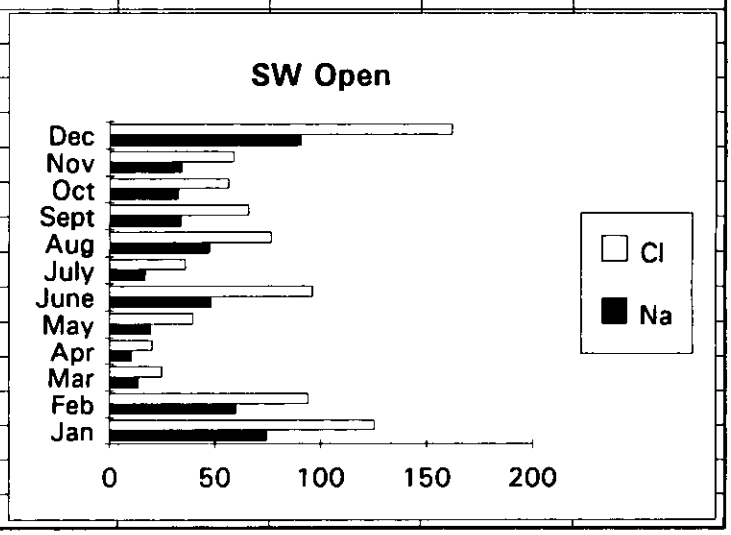
Open Control		
	Na	Cl
Jan	12.16	21.47
Feb	17.35	30.65
Mar	6.86	14.32
Apr	7.08	16.43
May	6.24	14.7
June	30.65	68.23
July	10.07	24.43
Aug	11.59	28
Sept	8.96	17.85
Oct	9.2	16.33
Nov	12.94	23.63
Dec	7.79	18.28



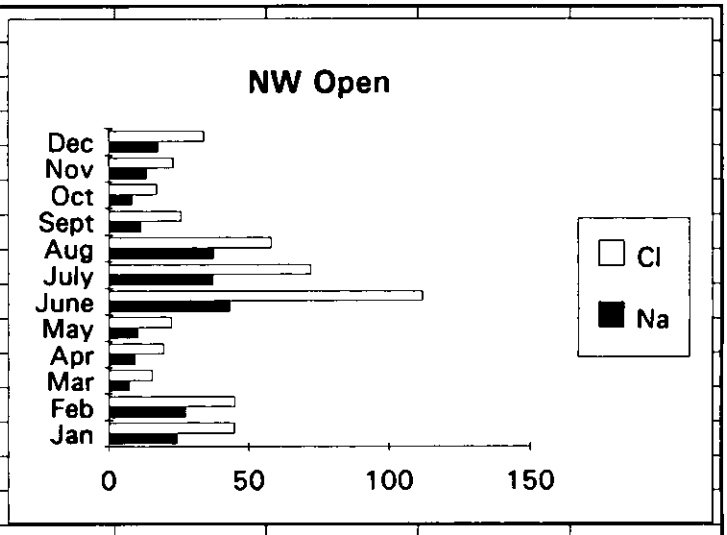
NE Open		
	Na	Cl
Jan	25.63	46.07
Feb	.	.
Mar	16.8	30.05
Apr	12.81	34.36
May	23.22	46.68
June	89.61	245.36
July	22.17	67.08
Aug	27.91	50.96
Sept	10.02	31.75
Oct	16.98	32.27
Nov	21.23	41.6
Dec	31.42	61.63



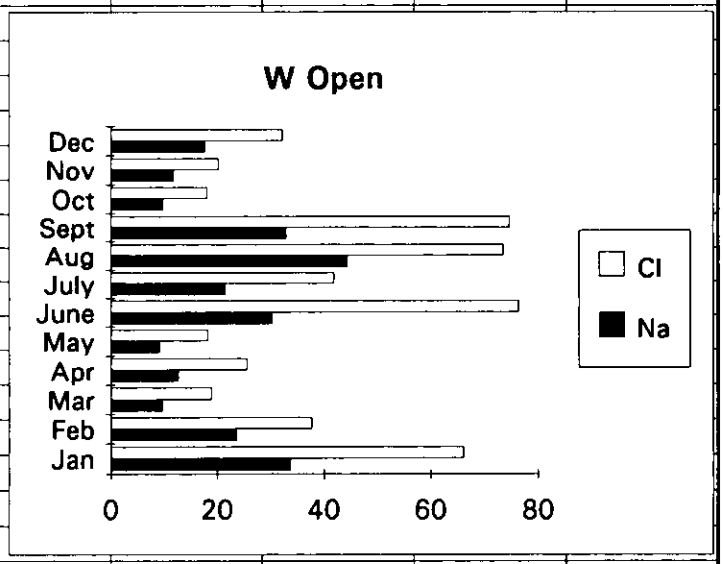
SW Open		
	Na	Cl
Jan	74.48	125.44
Feb	60.14	94.29
Mar	13.96	24.84
Apr	10.66	20.42
May	19.73	39.72
June	47.98	96.2
July	17.06	36.02
Aug	47.54	76.61
Sept	34.07	65.74
Oct	32.62	56.66
Nov	34.28	58.87
Dec	90.64	162.07



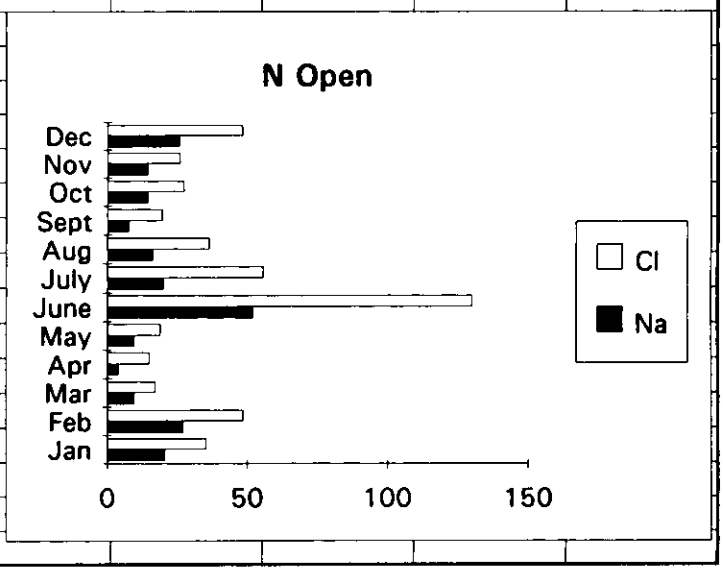
NW Open		
	Na	Cl
Jan	24.46	44.91
Feb	27.58	45.1
Mar	7.35	15.65
Apr	9.57	19.81
May	10.43	22.47
June	43.26	111.86
July	37.32	72.15
Aug	37.54	58.07
Sept	11.55	25.93
Oct	8.37	17.26
Nov	13.51	23.18
Dec	17.77	34.06



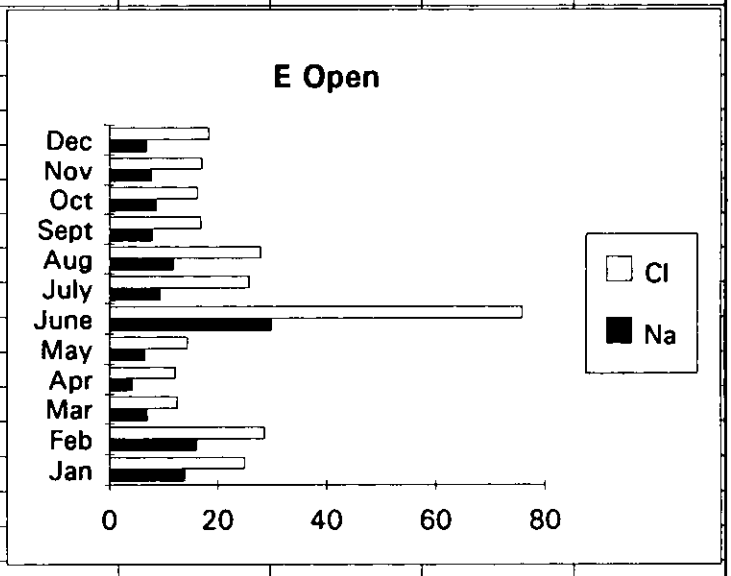
W Open		
	Na	Cl
Jan	33.84	66.19
Feb	23.73	37.82
Mar	9.91	19.06
Apr	12.78	25.68
May	9.25	18.35
June	30.39	76.46
July	21.59	41.98
Aug	44.42	73.61
Sept	33	74.8
Oct	9.91	18.19
Nov	11.85	20.38
Dec	17.74	32.26



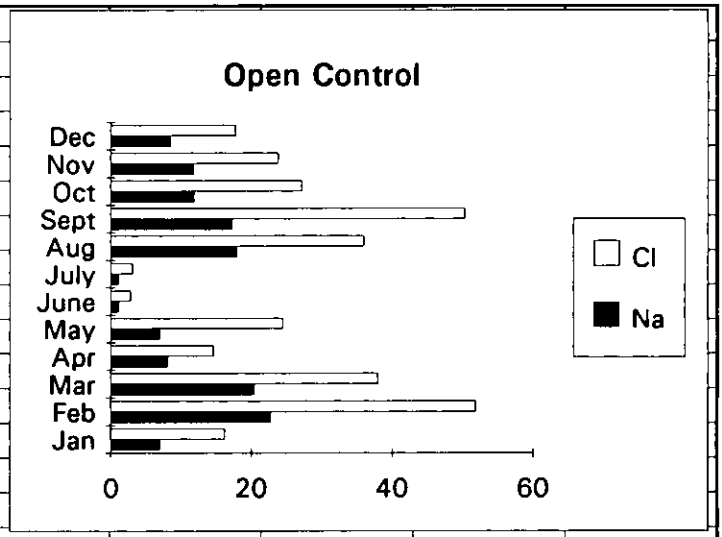
N Open		
	Na	Cl
Jan	20.61	35.5
Feb	27.12	48.54
Mar	9.64	17.15
Apr	3.94	15.31
May	9.75	19.1
June	52.29	130.39
July	20.12	55.97
Aug	16.34	36.55
Sept	7.57	19.81
Oct	14.6	27.44
Nov	14.7	26.16
Dec	25.8	48.38



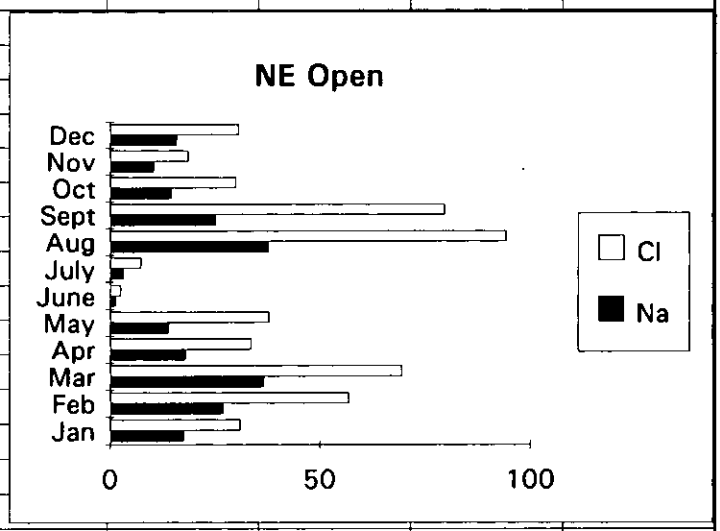
E Open		
	Na	Cl
Jan	13.93	24.96
Feb	16.24	28.59
Mar	7.08	12.6
Apr	4.42	12.19
May	6.62	14.45
June	29.85	75.88
July	9.4	25.85
Aug	11.92	27.86
Sept	7.98	16.9
Oct	8.76	16.35
Nov	7.89	17.1
Dec	6.92	18.45



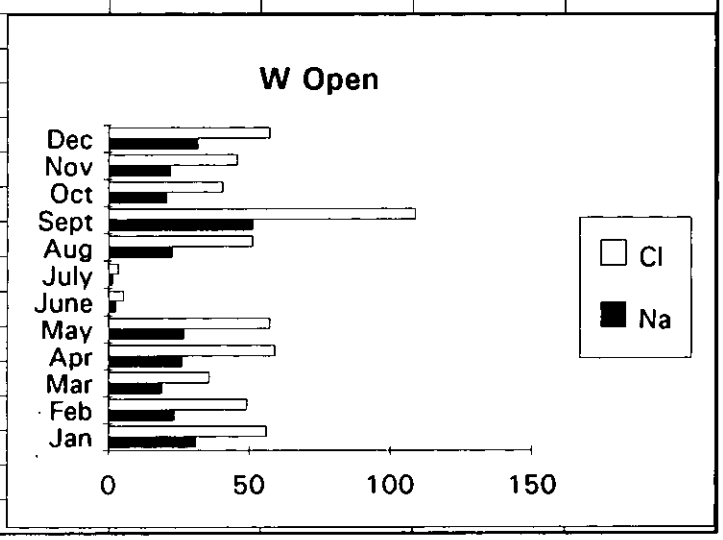
Open Control		
	Na	Cl
Jan	7	16.27
Feb	22.79	51.94
Mar	20.45	38.01
Apr	8.15	14.68
May	7.05	24.55
June	1.24	2.9
July	1.15	3.18
Aug	18	36
Sept	17.27	50.36
Oct	11.89	27.25
Nov	11.86	23.93
Dec	8.57	17.78



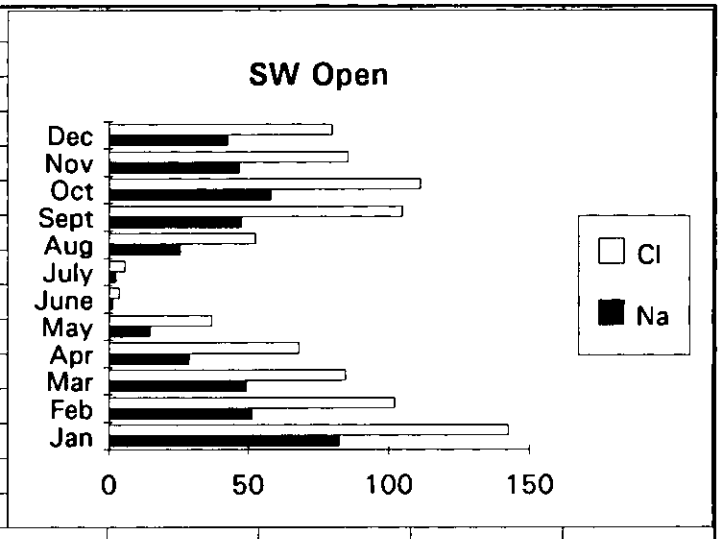
NE Open		
	Na	Cl
Jan	17.66	31.12
Feb	27.03	56.98
Mar	36.83	69.62
Apr	18.07	33.68
May	14.07	38
June	1.3	2.61
July	3.08	7.46
Aug	37.79	94.48
Sept	25.16	79.89
Oct	14.66	30.03
Nov	10.43	18.62
Dec	15.99	30.77



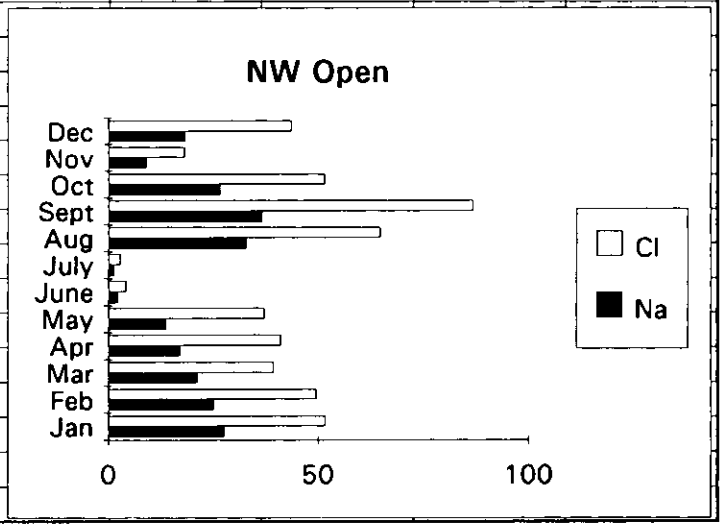
W Open		
	Na	Cl
Jan	31.23	56.33
Feb	23.57	49.48
Mar	19.33	36.13
Apr	26.47	59.23
May	27.03	57.44
June	2.76	5.55
July	1.81	3.77
Aug	22.95	51.39
Sept	51.48	108.96
Oct	21.01	40.68
Nov	22.21	46
Dec	32.01	57.44



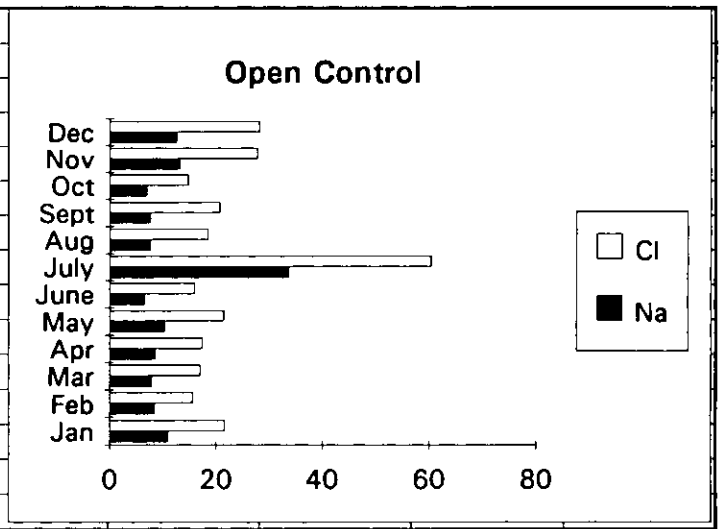
SW Open		
	Na	Cl
Jan	82.5	142.78
Feb	51.54	102.3
Mar	49.53	84.6
Apr	29.09	68.16
May	14.87	36.87
June	1.66	4.07
July	2.87	6.05
Aug	25.81	52.61
Sept	47.58	104.97
Oct	58.23	111.33
Nov	46.82	85.54
Dec	42.6	79.99



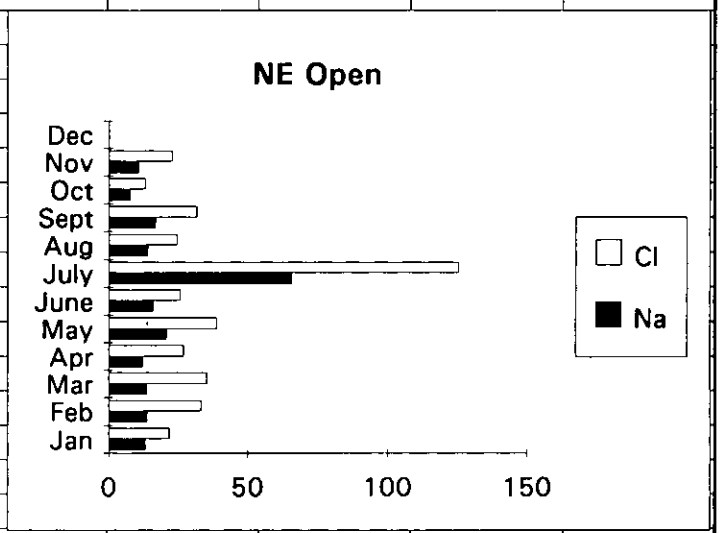
NW Open		
	Na	Cl
Jan	27.85	51.85
Feb	25.22	49.67
Mar	21.23	39.48
Apr	17.14	41.13
May	13.77	37.19
June	2.26	4.21
July	1.38	2.85
Aug	32.98	64.93
Sept	36.73	86.92
Oct	26.72	51.67
Nov	9.16	18.23
Dec	18.33	43.77



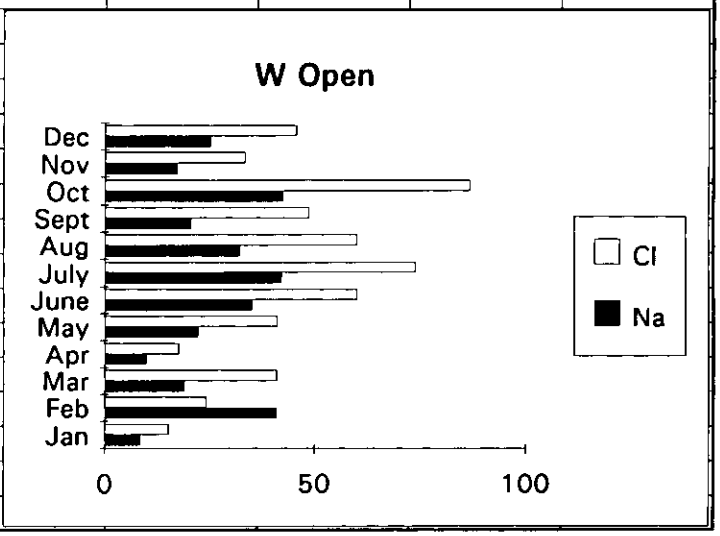
Open Control		
	Na	Cl
Jan	11.03	21.66
Feb	8.5	15.74
Mar	8.03	17.17
Apr	8.68	17.56
May	10.55	21.59
June	6.59	16.07
July	33.84	60.51
Aug	7.85	18.65
Sept	7.85	20.87
Oct	7.17	14.94
Nov	13.39	27.94
Dec	12.79	28.33



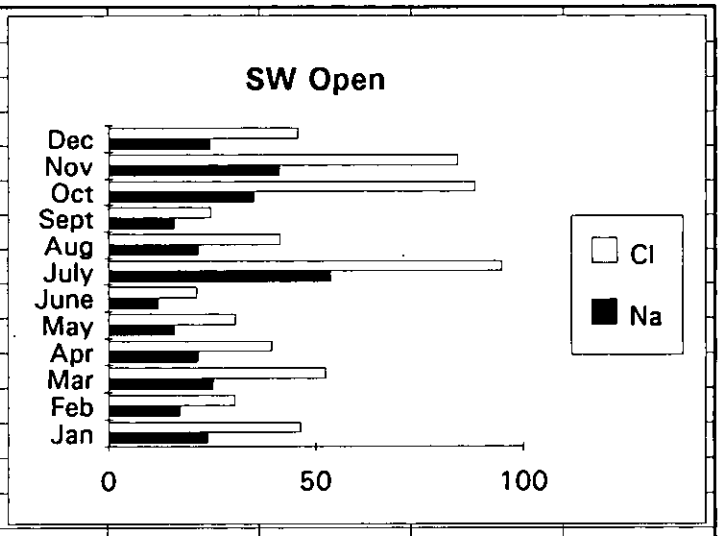
NE Open		
	Na	Cl
Jan	13.36	22
Feb	14.04	33.43
Mar	13.92	35.64
Apr	12.42	27.03
May	20.86	38.97
June	16.16	26.08
July	66.03	125.87
Aug	14.34	24.85
Sept	17.03	31.83
Oct	7.86	13.35
Nov	11.16	22.97
Dec	.	.



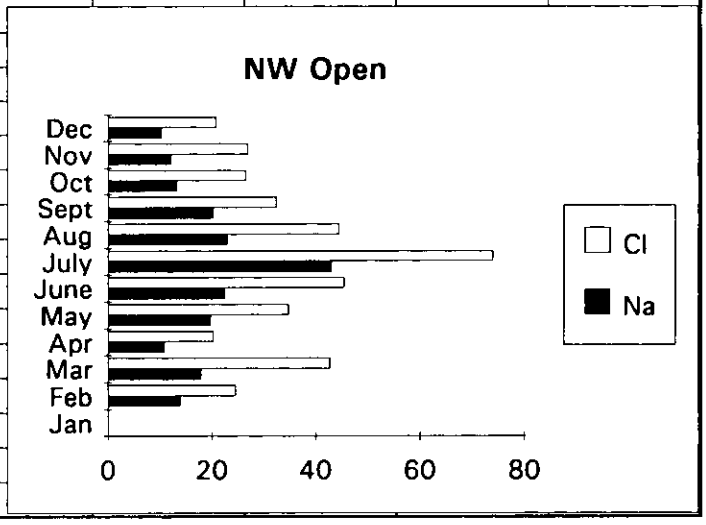
W Open		
	Na	Cl
Jan	8.52	15.44
Feb	41.04	24.26
Mar	19	41.08
Apr	10.02	17.76
May	22.36	41.2
June	35.2	60.11
July	42.2	74.1
Aug	32.18	60.09
Sept	20.62	48.7
Oct	42.51	87.02
Nov	17.31	33.52
Dec	25.41	45.76



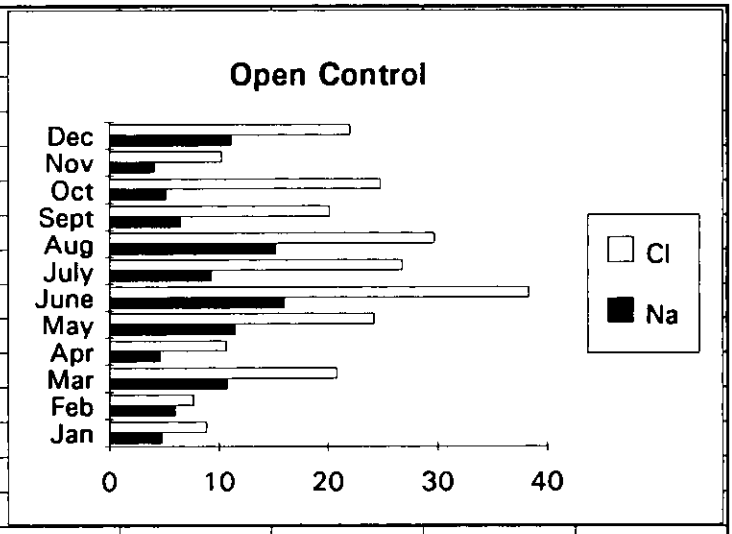
SW Open		
	Na	Cl
Jan	23.95	46.4
Feb	17.41	30.57
Mar	25.43	52.48
Apr	21.67	39.47
May	16.07	30.84
June	12.19	21.48
July	53.65	94.92
Aug	21.76	41.55
Sept	16.03	24.77
Oct	35.24	88.45
Nov	41.46	84.32
Dec	24.68	45.91



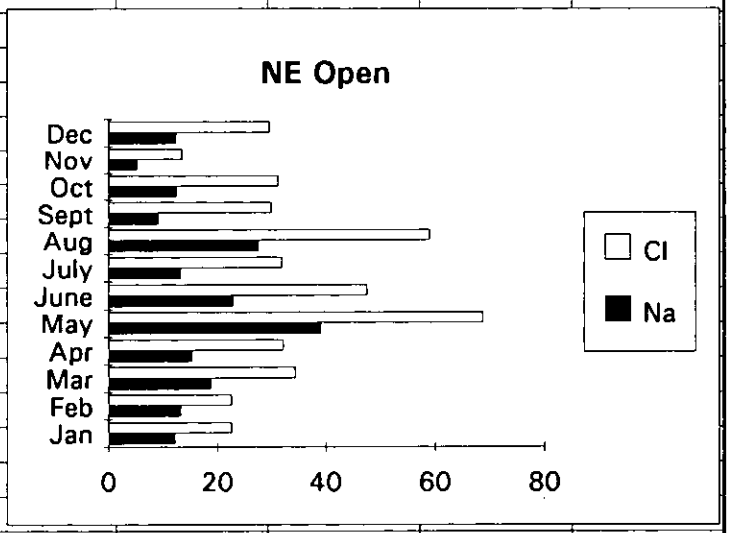
NW Open		
	Na	Cl
Jan	.	.
Feb	14.04	24.68
Mar	18.11	42.82
Apr	10.94	20.37
May	19.87	34.91
June	22.63	45.57
July	43.23	74.1
Aug	23.15	44.53
Sept	20.42	32.54
Oct	13.46	26.62
Nov	12.34	26.99
Dec	10.47	20.94



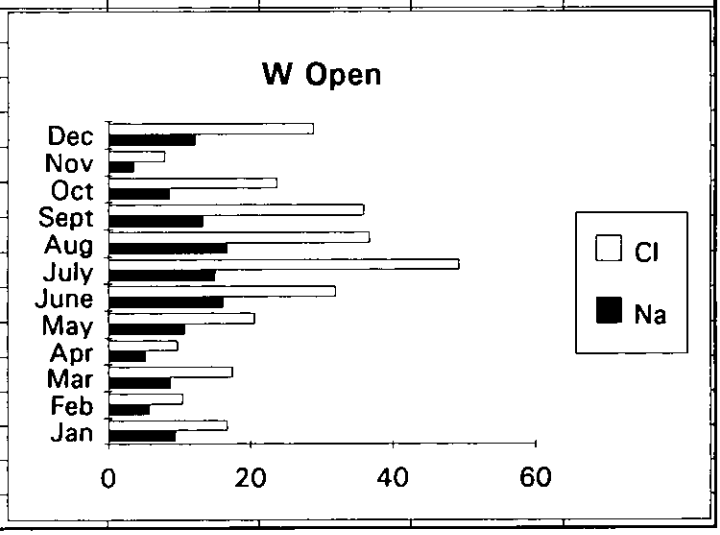
Open Control		
	Na	Cl
Jan	4.85	8.93
Feb	6.04	7.72
Mar	10.81	20.85
Apr	4.64	10.72
May	11.55	24.26
June	16.04	38.33
July	9.35	26.81
Aug	15.28	29.74
Sept	6.52	20.15
Oct	5.25	24.8
Nov	4.15	10.28
Dec	11.18	22.03



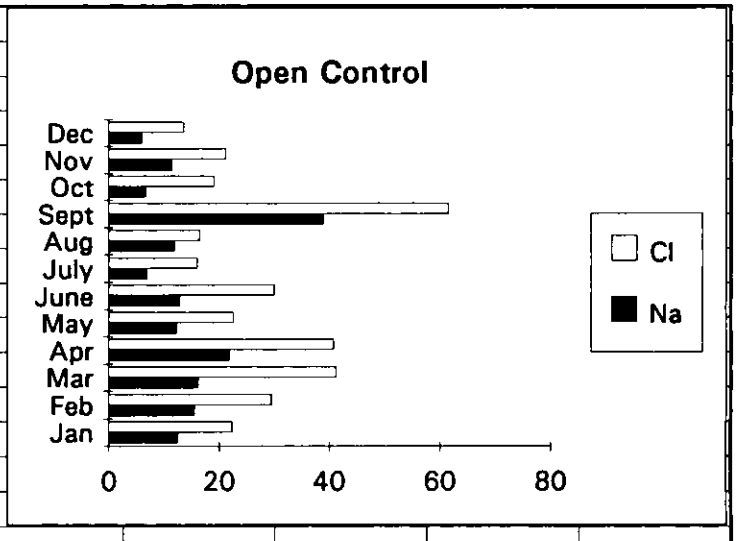
NE Open		
	Na	Cl
Jan	12.32	22.75
Feb	13.39	22.76
Mar	18.81	34.49
Apr	15.51	32.23
May	39.18	68.85
June	22.92	47.55
July	13.35	32.03
Aug	27.69	59.08
Sept	9.24	30.03
Oct	12.53	31.34
Nov	5.43	13.57
Dec	12.6	29.6



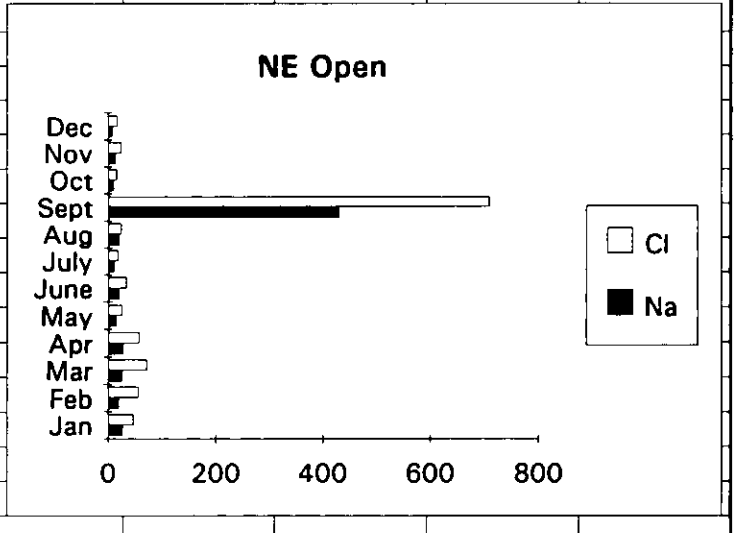
W Open		
	Na	Cl
Jan	9.51	16.74
Feb	5.81	10.46
Mar	8.75	17.5
Apr	5.26	9.73
May	10.71	20.6
June	16.18	31.95
July	15.07	49.33
Aug	16.72	36.72
Sept	13.32	35.96
Oct	8.62	23.72
Nov	3.55	8.01
Dec	12.27	28.86



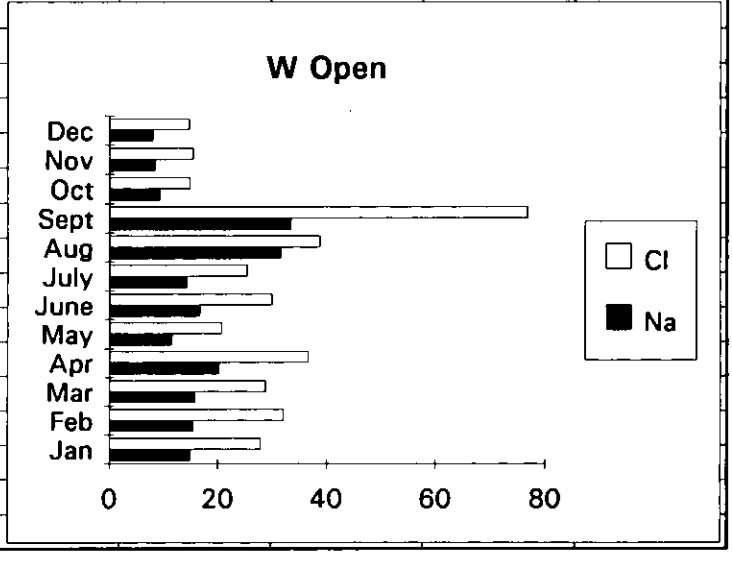
Open Control		
	Na	Cl
Jan	12.66	22.51
Feb	15.67	29.61
Mar	16.39	41.29
Apr	22.05	40.86
May	12.39	22.66
June	12.95	30.07
July	7.01	16.12
Aug	11.91	16.53
Sept	38.94	61.63
Oct	6.83	19.23
Nov	11.47	21.3
Dec	6.1	13.72



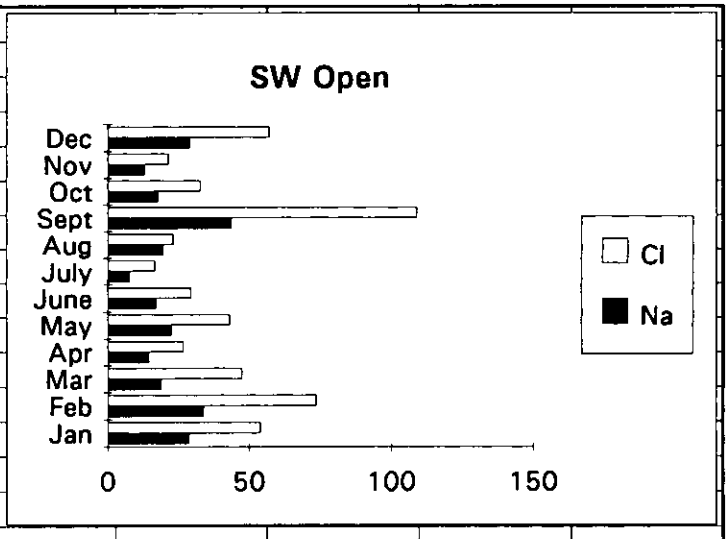
NE Open		
	Na	Cl
Jan	27.14	47.89
Feb	20.26	56.27
Mar	25.67	71.87
Apr	28.8	57.6
May	15.52	25.46
June	20.73	34.31
July	11.59	18.91
Aug	21.09	25.02
Sept	430.45	710.83
Oct	10.26	16.79
Nov	14.29	25.14
Dec	8.06	17.12



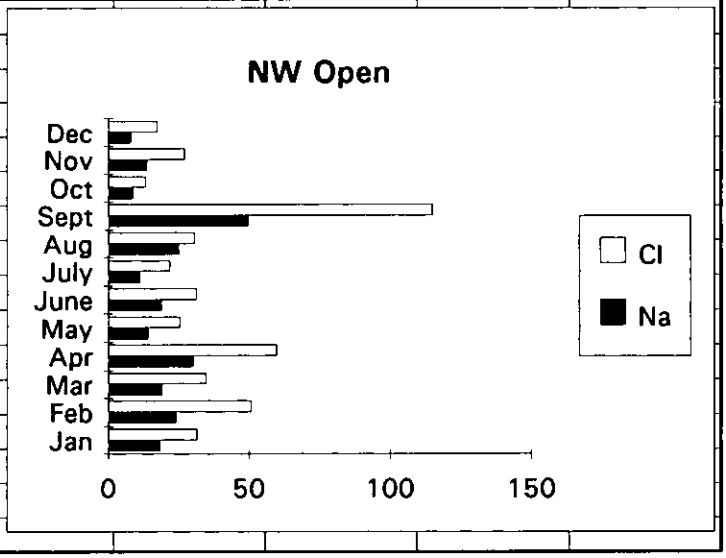
W Open		
	Na	Cl
Jan	14.99	27.97
Feb	15.54	32.18
Mar	15.89	28.83
Apr	20.29	36.78
May	11.68	20.77
June	16.83	30.09
July	14.38	25.49
Aug	31.74	38.87
Sept	33.57	77.01
Oct	9.34	14.89
Nov	8.49	15.48
Dec	8.14	14.75



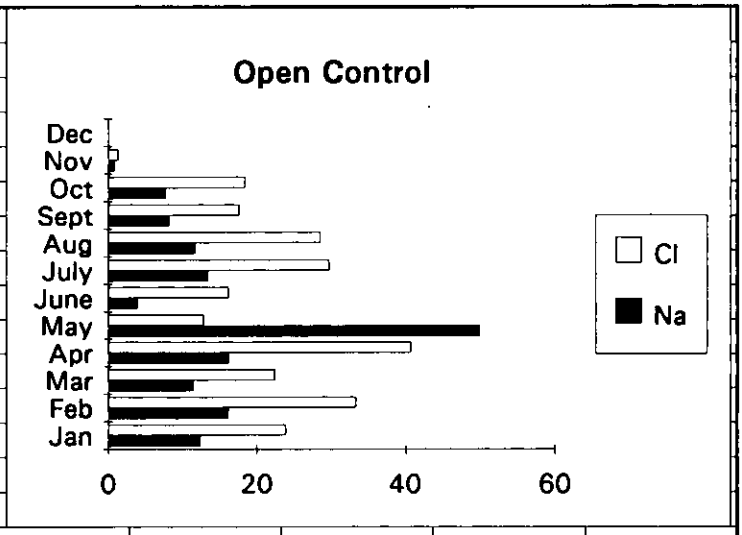
SW Open		
	Na	Cl
Jan	28.75	54.02
Feb	34.09	73.86
Mar	18.97	47.43
Apr	14.68	26.91
May	22.75	43.22
June	17.13	29.46
July	8.04	16.76
Aug	19.53	23.14
Sept	43.65	109.12
Oct	17.9	32.88
Nov	13.03	21.72
Dec	29.08	57.12



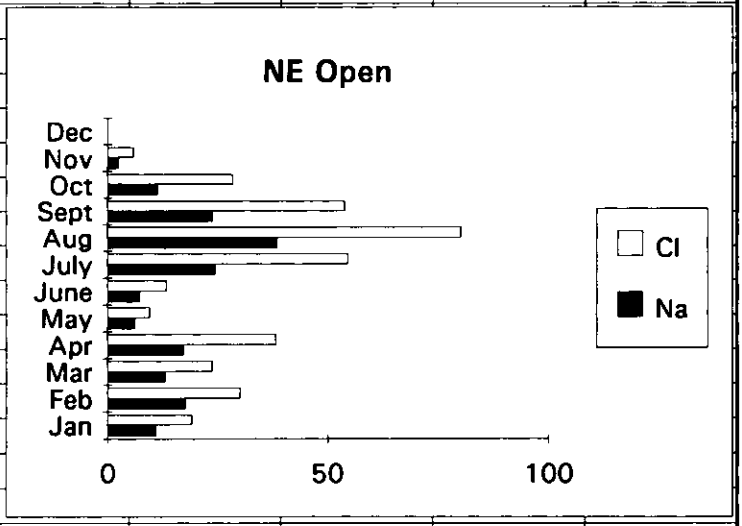
NW Open		
	Na	Cl
Jan	18.45	31.77
Feb	24.26	50.82
Mar	19.27	34.93
Apr	30.21	59.98
May	14.22	25.59
June	18.95	31.37
July	11.3	21.98
Aug	25.19	30.76
Sept	49.88	115.36
Oct	9.09	13.28
Nov	13.74	27.23
Dec	8.21	17.45



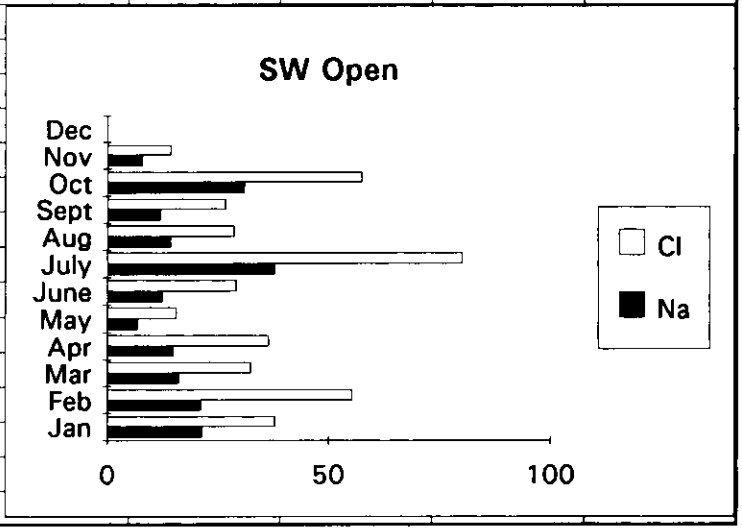
Open Control		
	Na	Cl
Jan	12.47	23.94
Feb	16.21	33.34
Mar	11.47	22.43
Apr	16.32	40.71
May	50	12.89
June	3.95	16.2
July	13.51	29.71
Aug	11.73	28.59
Sept	8.24	17.67
Oct	7.78	18.48
Nov	0.86	1.39
Dec		



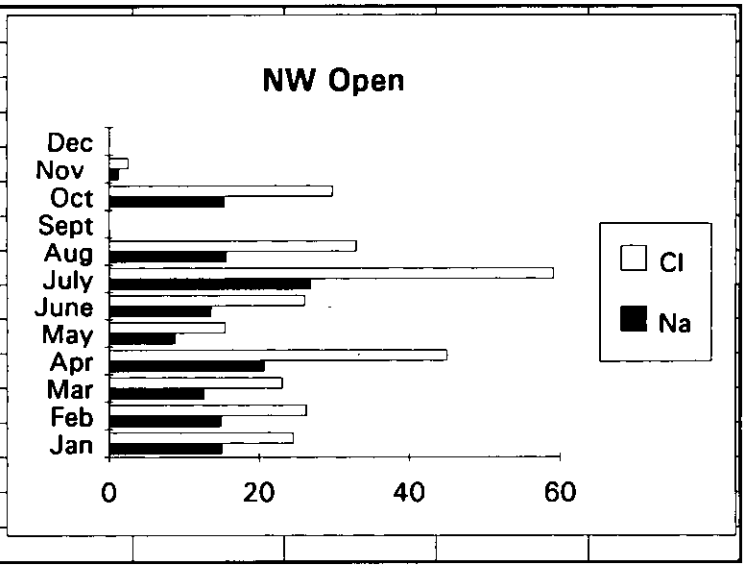
NE Open		
	Na	Cl
Jan	11.15	19.17
Feb	17.67	30.24
Mar	13.14	23.83
Apr	17.32	38.37
May	6.27	9.67
June	7.41	13.34
July	24.61	54.69
Aug	38.53	80.26
Sept	23.99	53.98
Oct	11.37	28.43
Nov	2.55	5.92
Dec		



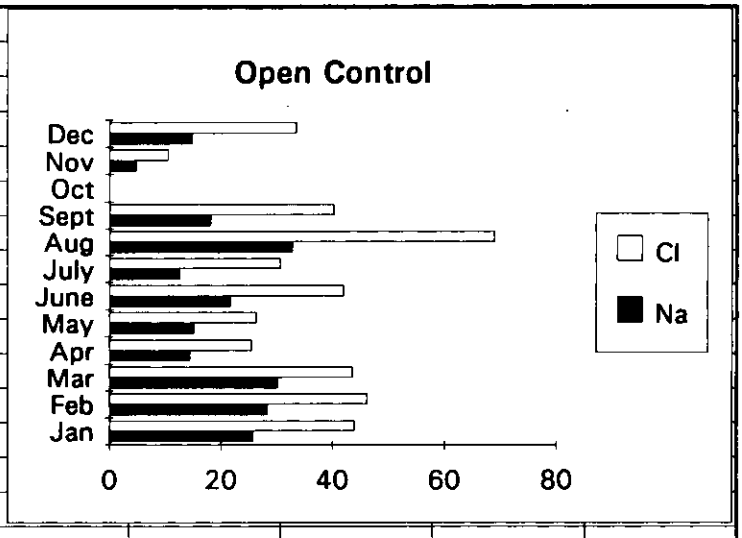
SW Open		
	Na	Cl
Jan	21.6	38.11
Feb	21.32	55.53
Mar	16.4	32.54
Apr	15.11	36.63
May	7.1	15.77
June	12.64	29.34
July	37.91	80.2
Aug	14.41	28.83
Sept	12.17	26.78
Oct	31.21	57.69
Nov	8.17	14.47
Dec		



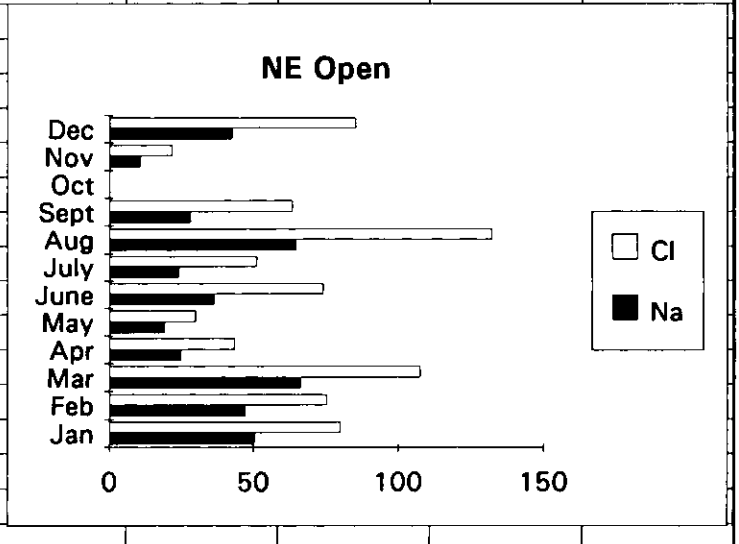
NW Open		
	Na	Cl
Jan	15.12	24.63
Feb	15.05	26.39
Mar	12.76	23.16
Apr	20.69	45.09
May	8.88	15.57
June	13.68	26.12
July	26.89	59.16
Aug	15.72	33.01
Sept		
Oct	15.42	29.87
Nov	1.33	2.65
Dec		



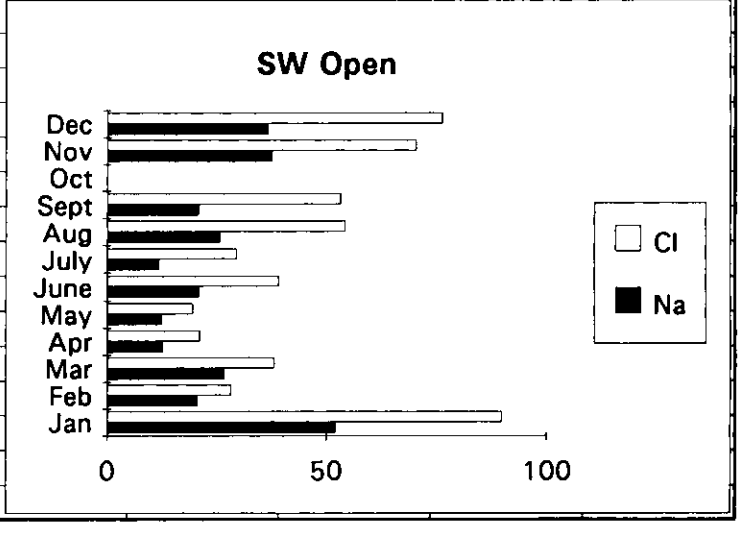
Open Control		
	Na	Cl
Jan	25.9	44.02
Feb	28.44	46.25
Mar	30.27	43.65
Apr	14.5	25.67
May	15.27	26.44
June	21.92	42.11
July	12.71	30.76
Aug	32.91	69.03
Sept	18.37	40.34
Oct		
Nov	4.98	10.71
Dec	14.83	33.66



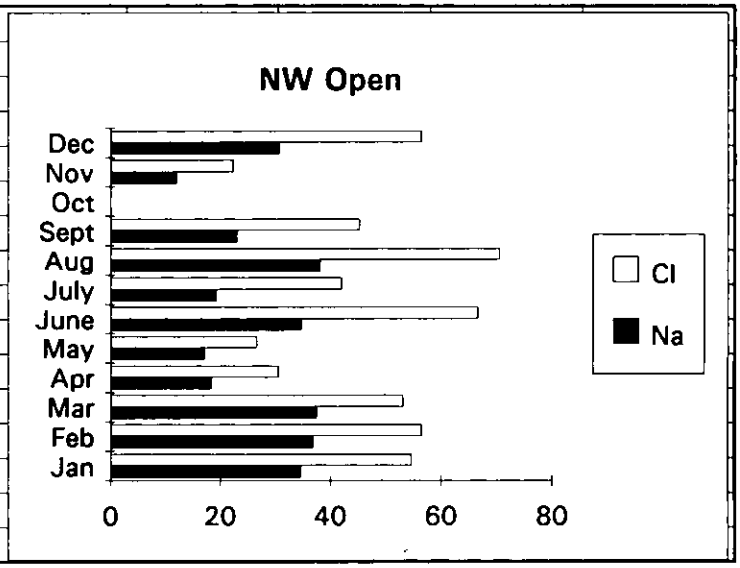
NE Open		
	Na	Cl
Jan	50.46	80.09
Feb	47.28	75.49
Mar	66.54	107.74
Apr	25.08	43.46
May	19.4	30.2
June	36.41	74.25
July	24.42	51.31
Aug	64.81	132.4
Sept	28.3	63.59
Oct		
Nov	10.92	22.01
Dec	42.77	85.36



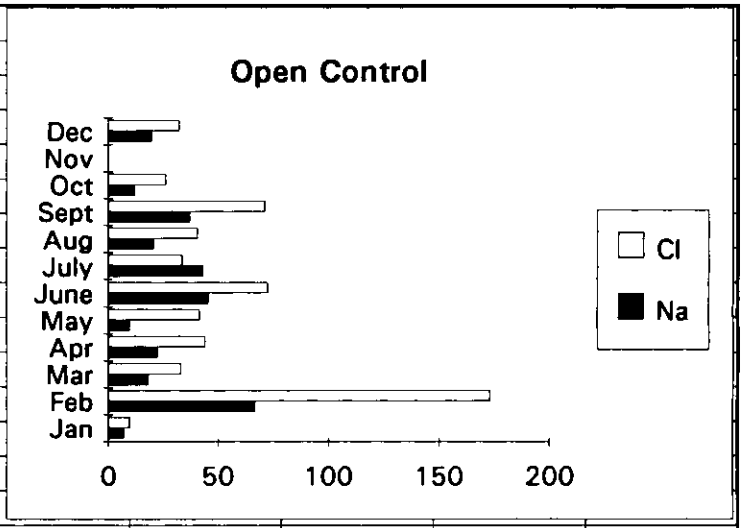
SW Open		
	Na	Cl
Jan	52.09	89.93
Feb	20.59	28.28
Mar	26.75	38.26
Apr	12.76	21.23
May	12.47	19.61
June	21.08	39.26
July	11.88	29.59
Aug	25.87	54.37
Sept	20.83	53.34
Oct		
Nov	37.57	70.51
Dec	36.77	76.38



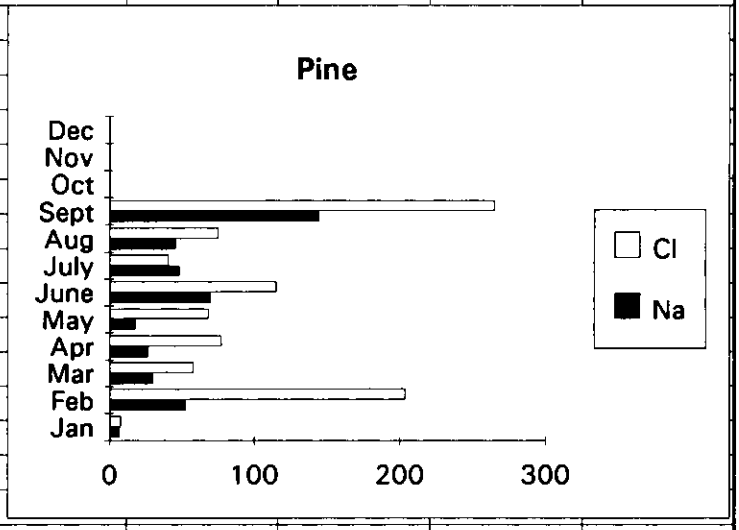
NW Open		
	Na	Cl
Jan	34.59	54.67
Feb	36.83	56.55
Mar	37.53	53.15
Apr	18.42	30.54
May	17.2	26.6
June	34.81	66.65
July	19.33	42.06
Aug	38.2	70.69
Sept	23.08	45.24
Oct		
Nov	12.11	22.4
Dec	30.65	56.48



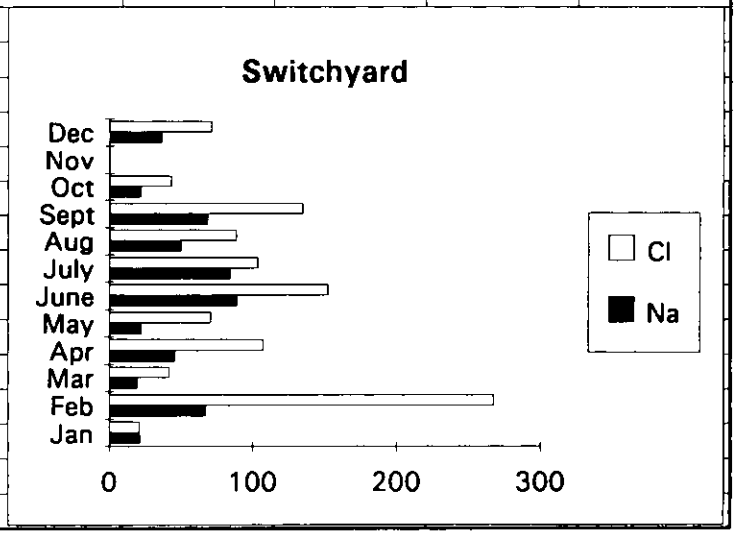
Open Control		
	Na	Cl
Jan	7.2	9.82
Feb	66.76	173.31
Mar	18.39	33.18
Apr	22.52	44.19
May	9.74	41.49
June	45.53	72.42
July	43.47	33.84
Aug	20.82	40.62
Sept	37.1	71.35
Oct	11.99	26.17
Nov		
Dec	19.82	32.32



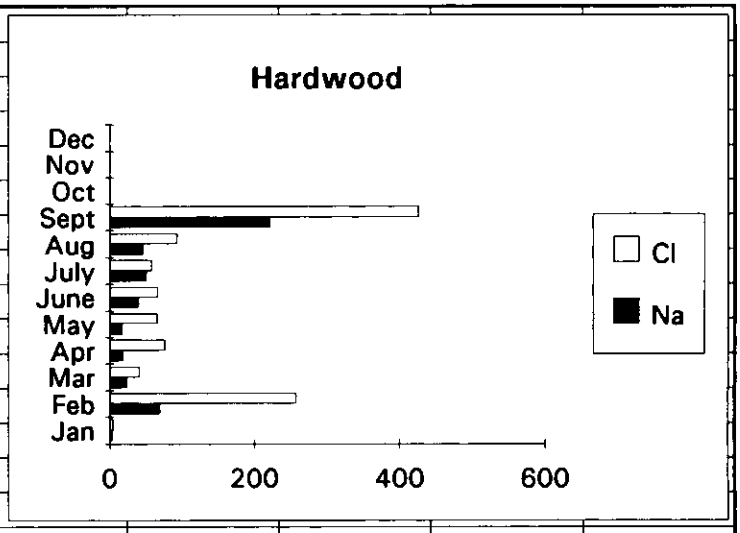
Pine		
	Na	Cl
Jan	7.21	8.26
Feb	53.1	203.98
Mar	30.23	58.12
Apr	26.97	77.39
May	18.01	68.72
June	69.97	115.1
July	48.63	41.11
Aug	45.92	75.09
Sept	144.76	265.21
Oct		
Nov		
Dec		



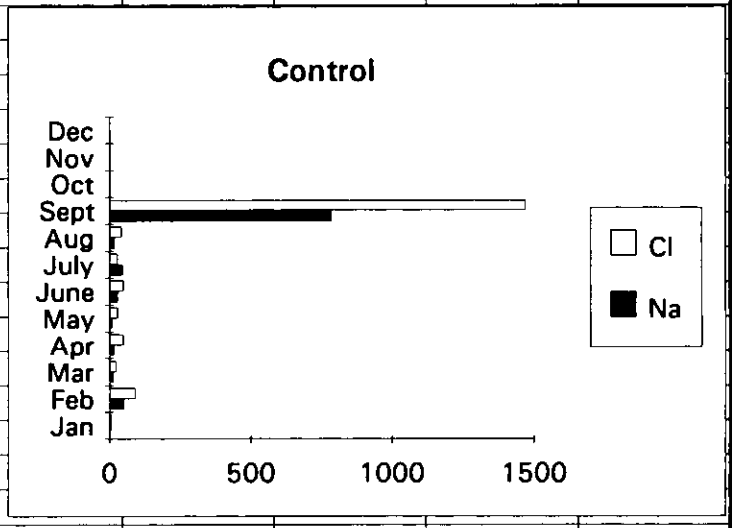
Switchyard		
	Na	Cl
Jan	21.48	21.14
Feb	67.33	268.31
Mar	19.88	41.93
Apr	45.99	107.49
May	22.36	71.12
June	89.12	153.15
July	84.94	103.8
Aug	50.19	89.08
Sept	68.89	135.33
Oct	22.11	43.63
Nov		
Dec	36.67	71.75



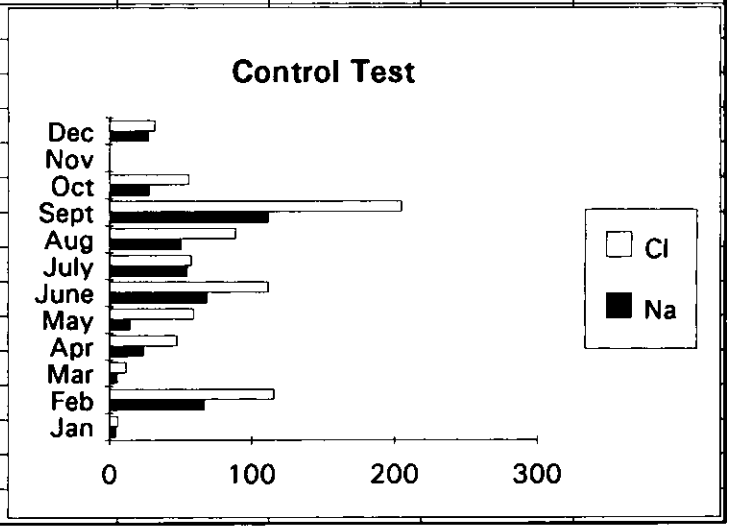
Hardwood		
	Na	Cl
Jan	3.78	5.55
Feb	69.33	258.22
Mar	23.64	41.4
Apr	18.59	76.33
May	17.27	66.26
June	40.82	66.47
July	51.3	58.45
Aug	46.76	93.03
Sept	221.42	426.55
Oct		
Nov		
Dec		



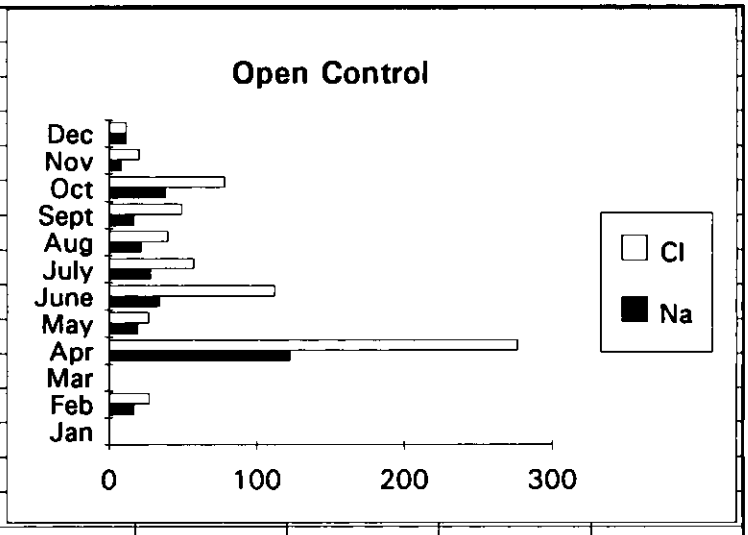
Control		
	Na	Cl
Jan	4.24	6.56
Feb	51.65	91.81
Mar	14.97	24.24
Apr	16.44	49.64
May	8.05	29.33
June	28.73	50.73
July	47.6	29.46
Aug	18.21	42.33
Sept	788.04	1469.93
Oct		
Nov		
Dec		



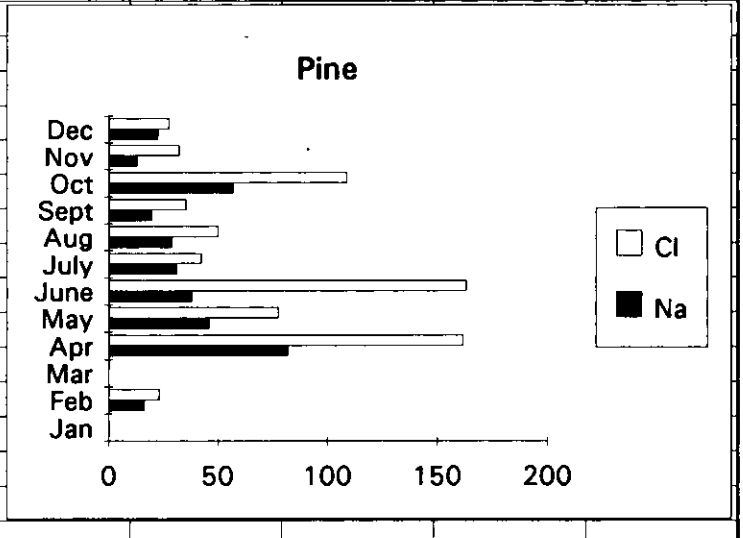
Control Test		
	Na	Cl
Jan	4.91	6.67
Feb	67.14	116.32
Mar	6.11	12.16
Apr	24.25	48.11
May	14.82	59.73
June	69.22	112.01
July	55.37	57.74
Aug	50.64	89.06
Sept	112.22	205.62
Oct	28.56	56.01
Nov		
Dec	28.12	32.32



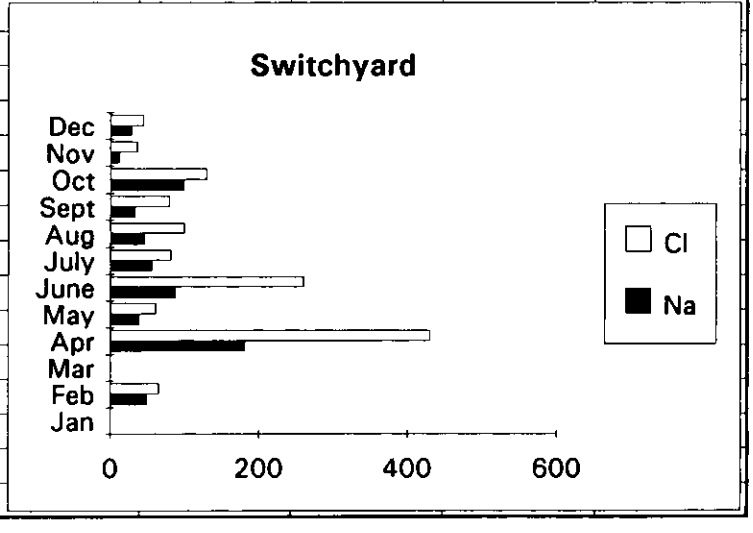
Open Control		
	Na	Cl
Jan		
Feb	17.267	27.518
Mar		
Apr	122.97	276.53
May	19.919	27.472
June	34.722	112.93
July	28.676	57.992
Aug	22.149	40.463
Sept	17.237	49.637
Oct	38.51	78.68
Nov	8.6	20.92
Dec	11.56	12.4



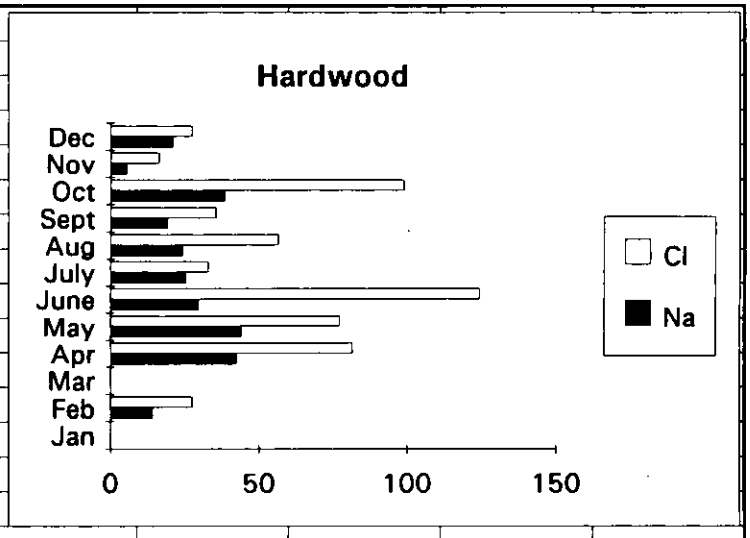
Pine		
	Na	Cl
Jan		
Feb	16.565	23.32
Mar		
Apr	82.233	161.87
May	45.973	77.687
June	38.264	163.26
July	31.275	42.587
Aug	29.082	50.185
Sept	19.802	35.622
Oct	57.14	108.98
Nov	13.27	32.27
Dec	22.83	27.66



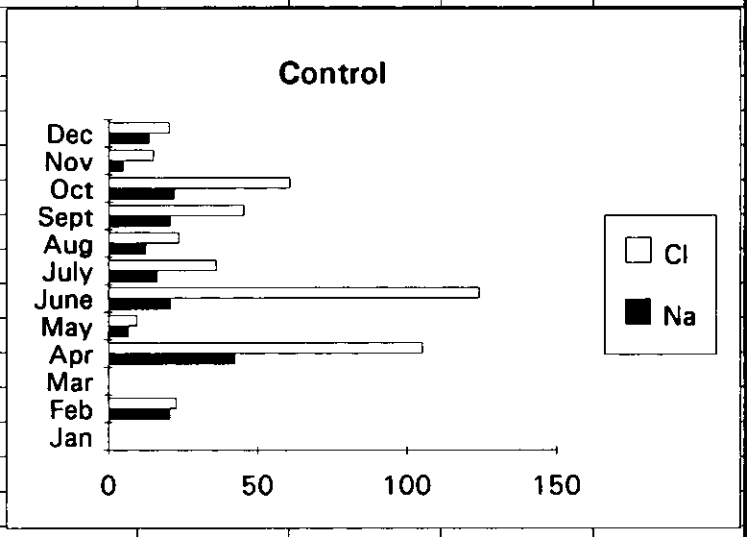
Switchyard		
	Na	Cl
Jan		
Feb	50.182	66.807
Mar		
Apr	182.63	431.3
May	39.482	62.169
June	88.69	261.33
July	56.83	82.831
Aug	46.94	100.891
Sept	34.099	79.853
Oct	99.39	131.101
Nov	13.17	37.1
Dec	29.05	45.91



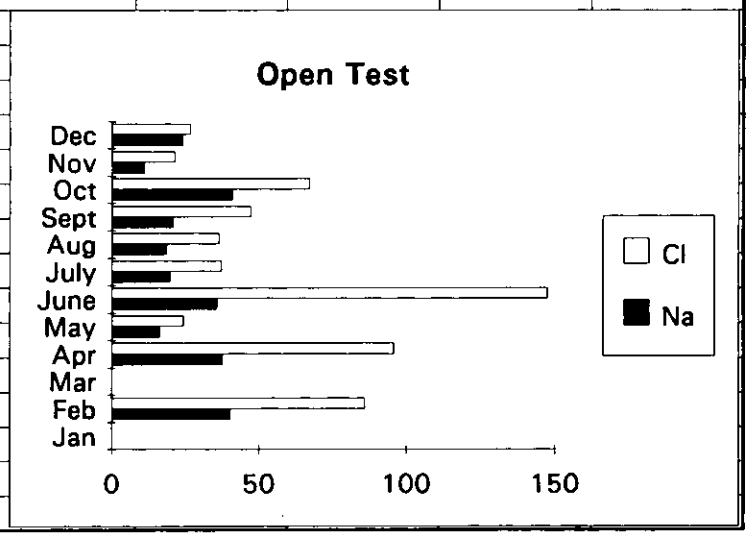
Hardwood		
	Na	Cl
Jan		
Feb	14.505	27.702
Mar		
Apr	42.629	81.627
May	44.307	77.338
June	29.796	124.51
July	25.586	33.168
Aug	24.52	56.753
Sept	19.302	35.622
Oct	38.77	99.21
Nov	5.66	16.63
Dec	21.34	27.73



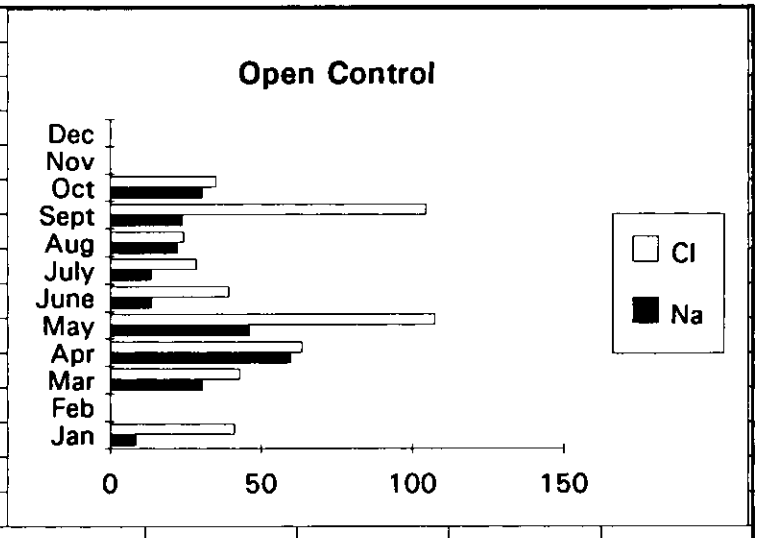
Control		
	Na	Cl
Jan		
Feb	20.818	22.963
Mar		
Apr	42.5	105.48
May	6.823	9.566
June	20.857	124.51
July	16.404	36.235
Aug	12.483	23.703
Sept	20.847	45.618
Oct	22.12	60.88
Nov	4.94	15.2
Dec	13.6	20.53



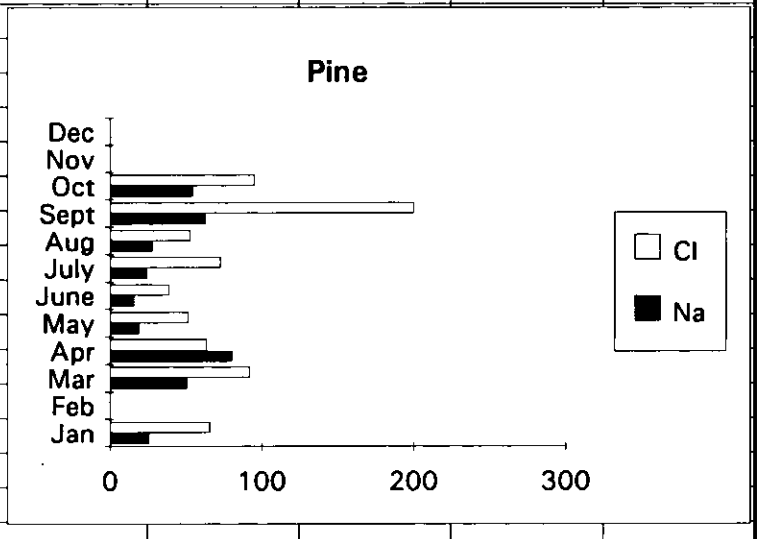
Open Test		
	Na	Cl
Jan		
Feb	40.425	86.019
Mar		
Apr	37.87	95.828
May	16.516	24.529
June	35.849	147.72
July	19.972	37.365
Aug	18.893	36.537
Sept	20.998	47.383
Oct	41.07	67.25
Nov	11.26	21.61
Dec	24.36	26.97



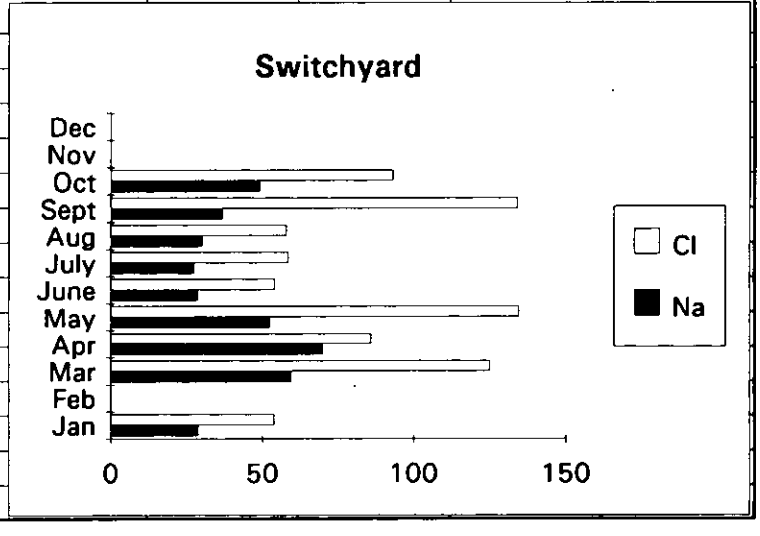
Open Control		
	Na	Cl
Jan	8.83	41.356
Feb		
Mar	30.864	43.049
Apr	59.908	63.872
May	46.343	107.666
June	13.963	39.472
July	13.718	28.885
Aug	22.496	24.471
Sept	24.139	104.596
Oct	30.836	35.403
Nov		
Dec		



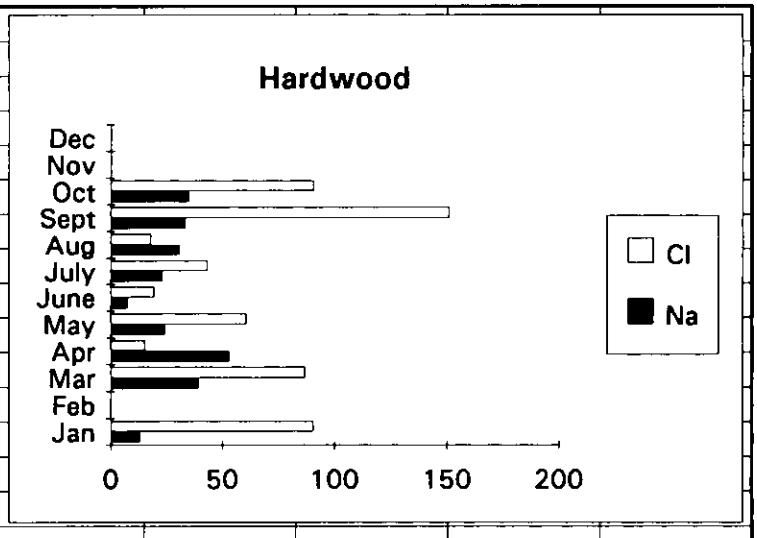
Pine		
	Na	Cl
Jan	26.272	66.168
Feb		
Mar	51.125	92.477
Apr	80.877	64.06
May	19.572	51.733
June	15.977	39.193
July	24.519	73.165
Aug	28.356	53.097
Sept	62.987	200.274
Oct	54.827	95.266
Nov		
Dec		



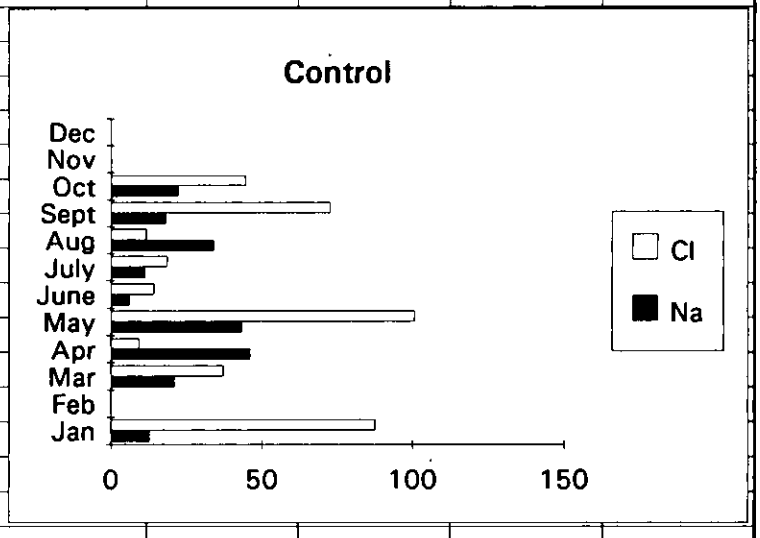
Switchyard		
	Na	Cl
Jan	29.15	54.114
Feb		
Mar	59.85	125.285
Apr	70.178	86.068
May	52.679	134.638
June	28.92	54.216
July	27.521	58.812
Aug	30.268	58.088
Sept	37.139	134.266
Oct	49.233	93.224
Nov		
Dec		



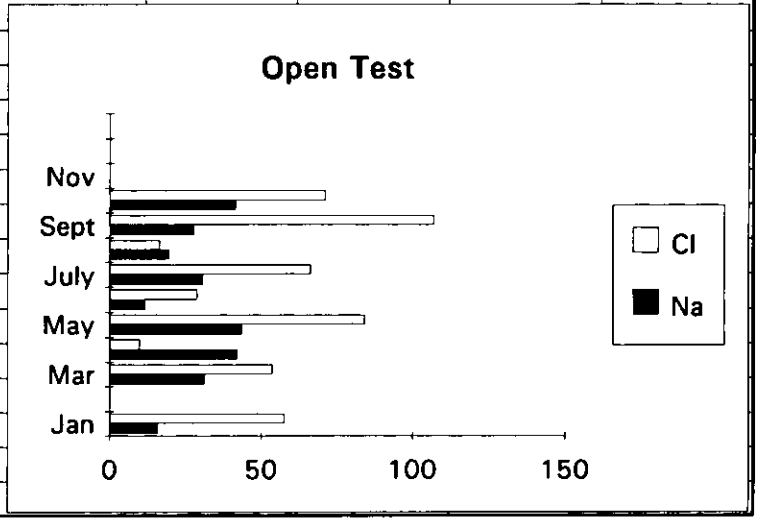
Hardwood		
	Na	Cl
Jan	13.343	90.543
Feb		
Mar	39.311	87.054
Apr	53.121	15.513
May	24.405	60.745
June	7.658	19.349
July	23.093	43.369
Aug	30.887	17.993
Sept	33.426	151.333
Oct	35.052	90.901
Nov		
Dec		



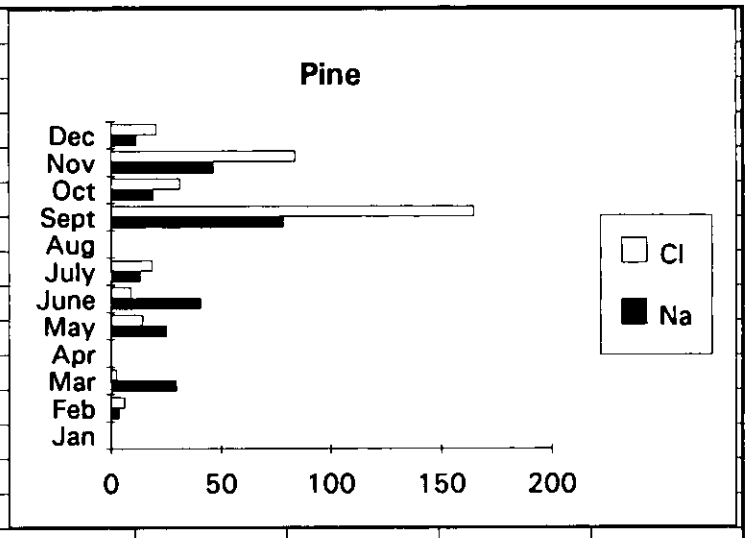
Control		
	Na	Cl
Jan	12.822	87.748
Feb		
Mar	21.168	37.385
Apr	46.254	9.509
May	43.518	100.792
June	6.252	14.371
July	11.389	18.751
Aug	34.322	11.81
Sept	18.371	72.858
Oct	22.304	44.728
Nov		
Dec		



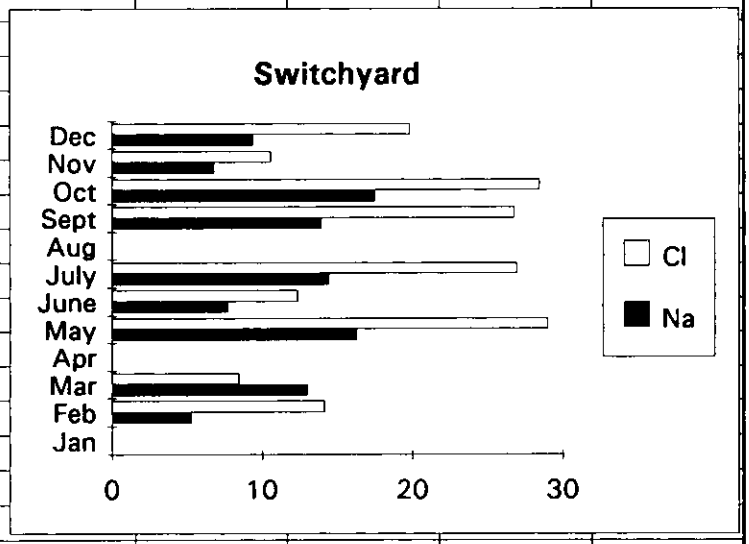
Open Test		
	Na	Cl
Jan	16.01	57.838
Feb		
Mar	31.456	53.863
Apr	42.375	10.08
May	43.686	84.508
June	11.815	29.09
July	30.842	66.467
Aug	19.854	16.595
Sept	27.94	107.072
Oct	41.738	71.353
Nov		
Dec		



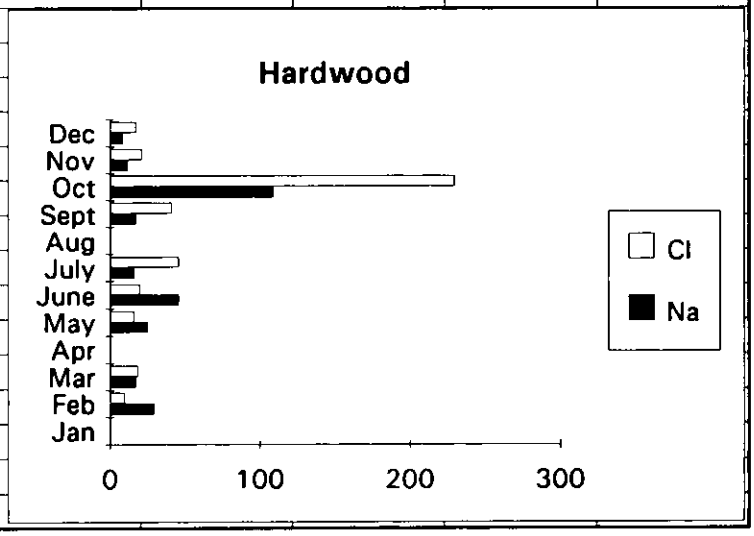
Pine		
	Na	Cl
Jan		
Feb	3.95	6.53
Mar	29.861	2.733
Apr		
May	25.684	14.543
June	40.923	9.307
July	13.483	18.84
Aug		
Sept	78.47	164.807
Oct	19.547	31.594
Nov	46.598	83.901
Dec	11.694	20.822



Switchyard		
	Na	Cl
Jan		
Feb	5.32	14.203
Mar	13.024	8.49
Apr		
May	16.309	29.017
June	7.787	12.383
July	14.463	26.963
Aug		
Sept	13.976	26.789
Oct	17.53	28.443
Nov	6.845	10.599
Dec	9.431	19.898



Hardwood		
	Na	Cl
Jan		
Feb	29.947	9.757
Mar	17.529	18.917
Apr		
May	25.008	16.087
June	45.85	19.837
July	16.067	46.1
Aug		
Sept	17.428	41.246
Oct	108.925	229.863
Nov	11.938	21.227
Dec	8.574	17.514



Control		
	Na	Cl
Jan		
Feb	14.513	7.103
Mar	8.268	18.707
Apr		
May	17.427	11.17
June	66.373	12.957
July	14.336	40.51
Aug		
Sept	31.828	66.778
Oct	20.442	31.465
Nov	9.35	8.748
Dec	21.64	25.954