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Houston, Texas 77058

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DEVELOPMENT OF A UNIVERSAL WATER SIGNATURE FOR THE LANDSAT-3 MULTISPECTRAL SCANNER (Part 2 of 2)

NAS 9-15800
LEMSCO-15621 (Part 2)
September 1980
Final Report for Period January - September 1980

DEVELOPMENT OF A UNIVERSAL WATER SIGNATURE FOR THE LANDSAT-3 MULTISPECTRAL SCANNER (Part 2 of 2)

Edward H. Schlosser
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Final Report for Period January - September 1980

Prepared for
EARTH OBSERVATIONS DIVISION
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
LYNDON B. JOHNSON SPACE CENTER
HOUSTON, TEXAS 77058

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15. Supplementary Notes

The water-classification discriminant and a water-ness transformation based on it have been incorporated in version 8009 of the Detection And Mapping (DAM) package for processing Landsat digital data.

16. Abstract

A generalized four-channel hyperplane to discriminate water from non-water was developed using Landsat-3 multispectral scanner (MSS) scenes and matching same/next-day color infrared aerial photography.

The MSS scenes over upstate New York, eastern Washington, Montana and Louisiana taken between May and October 1978 varied in sun elevation angle from 40 to 58 degrees. The 28 matching air photo frames selected for analysis contained over 1400 water bodies larger than one surface acre. A preliminary water discriminant, based on previously labelled cluster means from Landsat-3 scenes in east Texas, was used to screen the data and eliminate from further consideration all pixels distant from water in MSS spectral space. Approximately 1300 pixels, half of them non-edge water pixels and half non-water pixels spectrally close to water, were labelled. A linear discriminant was iteratively fitted to the labelled pixels, giving more weight to those pixels that were difficult to discriminate. This discriminant correctly classified 98.7 percent of the water pixels and 98.6 percent of the non-water pixels.

Per feature analysis of all 28 air photo frames indicated that the discriminant detected (with one or more pixels) 91.3 percent of the 414 water bodies over 10 acres in surface area. The discriminant misclassified as water 36 groups of contiguous non-water pixels, a "false alarm" rate equal to 8.7 percent of the water bodies over 10 acres.

17. Key Words (Suggested by Author(s))	18. Distribution Statement
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PREFACE

This report documents the development of a universal four-channel water discriminant for the Landsat-3 multispectral scanner (MSS). The report is divided into two volumes. Part 1 describes the approach, data, preprocessing, analysis, and results. Part 2 contains technical appendices listing the input data, software, and computer-generated output.

CONTENTS

Section [published separately as Part 1]

1. PURPOSE 1-1

1.1 BACKGROUND 1-1

1.2 PERFORMANCE CRITERIA 1-1

2. STUDY DESIGN 2-1

2.1 CONSTRAINTS 2-1

2.2 APPROACH 2-1

3. DATA AND PREPROCESSING 3-1

3.1 SITE AND FRAME SELECTION 3-1

3.2 AIR PHOTO PREPROCESSING 3-1

3.3 LANDSAT PREPROCESSING 3-3

4. ANALYSIS 4-1

4.1 GROUND FEATURE SELECTION AND LABELLING 4-1

4.2 PAIRWISE SPECTRAL PLOTS 4-1

4.3 WEIGHTED LINEAR DISCRIMINANT FIT 4-4

4.4 PER FEATURE AND SHIFTING TABULATION 4-8

5. CONCLUSIONS 5-1

6. REFERENCES 6-1

Appendices [published separately as Part 2]

A. AERIAL PHOTOGRAPHY SUMMARY A-1

B. SPECTRAL PLOT SOFTWARE B-1

C. SPECTRAL PLOT DATA C-1

D. LINEAR DISCRIMINANT SOFTWARE D-1

E. LINEAR DISCRIMINANT DATA E-1

F. TABULATION SOFTWARE F-1
G. TABULATION DATA G-1
H. FINAL SIGNATURES CODED FOR DAM PACKAGE H-1

APPENDIX A
AERIAL PHOTOGRAPHY SUMMARY

NEW YORK SITE A-2

WASHINGTON SITE A-3

MONTANA SITE A-5

LOUISIANA SITE A-7

UTM COORDINATES OF FRAME CORNERS A-9

MISSION 382
TEST SITE 344
GENERAL

Mission 382 was flown on May 26, 1978, over Upper New York Regional (Site 344). The WB-57F (NASA 926) aircraft carried sensors covering the visible regions of the electromagnetic spectrum.

The imaging sensors operated on this mission were as follows:

1) Two 9-inch format zeiss cameras with 6-inch focal length lenses.

MISSION 382 SENSOR DATA SITE 344(OA-0359)
FLIGHT 7 26 MAY 1978

SENSORS TYPE	LENS FOCAL LENGTH	FILM	FILTER
ZEISS/3	6 in.	2443	KLF36 + 12
ZEISS/4	6 in.	SO-397	KLF36 + 2A

SENSORS TYPE	ROLL	LINE	FRAME START	FRAME STOP	RADAR ALTITUDE
ZEISS/3	2	3/1	0060	0074	58,300
ZEISS/3	2	2/1	0076	0089	58,100
ZEISS/3	2	1/1	0092	0105	58,100

FLIGHT SUMMARY REPORT

Flight No: 78-092 **Date:** 13 July 1978

FSR No: 1154 **Julian Date:** 194

Sensor Package: Dual RC-10 **Aircraft No:** 5

Purpose of Flight: #0697 Support
Requestor: Stephan

Area(s) Covered: Washington

SENSOR DATA

Accession No:	02632	02633
Sensor ID No:	035	036
Sensor Type:	RC-10	RC-10
Focal Length:	6" 153.46mm	6" 153.19mm
Film Type:	High Definition Aerochrome Infrared, SO-127	Panatomic-X, 3400
Filtration:	CC .20B + 2.2AV	WRATTEN 12+ 2.2AV
Spectral Band:	510-900nm	510-700nm
f Stop:	4.0	4.0
Shutter Speed:	1/125	1/125
No. of Frames:	219	220
% Overlap:	60	60
Quality:	Excellent	Excellent
Remarks:	---	---

FLIGHT SUMMARY

78-092

This flight was flown in support of Flight Request #0697 (Stephan, Battelle Pacific Northwest Laboratories) under the FY 1978 Airborne Instrumentation Research Program (AIRP) plan. The Dual RC-10 camera configuration was utilized to acquire photography over Washington (see Track Map).

Scattered cloud cover was encountered throughout the flight (see Flight Line Data). Both rolls of photography are of excellent quality with no camera malfunctions noted. Due to processing residue accumulation, one frame of the black and white photography has a base tear (see Flight Line Data). No other processing malfunctions are noted.

FLIGHT SUMMARY REPORT

Flight No: 78-136

Date: 16 September 1978

FSR No: 1193

Julian Date: 259

Sensor Package: RC-10

Aircraft No: 4

Purpose of Flight: #0601 Support
Requestor: Landers

Area(s) Covered: Eastern Montana

SENSOR DATA

Accession No:	02682
Sensor ID No:	036
Sensor Type:	RC-10
Focal Length:	6" 153.19mm
Film Type:	High Definition Aerochrome Infrared, SO-127
Filtration:	CC .10B + 2.2AV
Spectral Band:	510-900nm
f Stop:	4
Shutter Speed:	1/100
No. of Frames:	256
% Overlap:	60
Quality:	Excellent
Remarks:	---

FLIGHT SUMMARY

78-136

This flight was flown in support of Flight Request #0601 (Landers, EPA) under the FY 1978 Airborne Instrumentation Research Program (AIRP) plan. Photographic data was acquired over eastern Montana (see Track Map).

Minor scattered cumulus clouds were encountered throughout the flight. The photography acquired is of excellent quality with no camera or processing malfunctions noted.

FLIGHT SUMMARY REPORT

Flight No: 78-143 **Date:** 8 October 1978

FSR No: 1199 **Julian Date:** 281

Sensor Package: Dual RC-10 **Aircraft No:** 5

Purpose of Flight: #0754 Support
Requestor: Landers

Area(s) Covered: Northern Louisiana

SENSOR DATA

Accession No:	02689	02690
Sensor ID No:	034	026
Sensor Type:	RC-10	RC-10
Focal Length:	12" 304.66mm	12" 304.97mm
Film Type:	High Definition Aerochrome Infrared, SO-127	High Definition Aerochrome Infrared, SO-127
Filtration:	CC .10B	CC .10B
Spectral Band:	510-900nm	510-900nm
f Stop:	4	4
Shutter Speed:	1/200	1/200
No. of Frames:	262	158
% Overlap:	60	60
Quality:	Excellent	Excellent
Remarks:	---	---

FLIGHT SUMMARY

78-143

This flight was flown in support of Flight Request #0754 (Landers, EPA) under the FY 1978 Airborne Instrumentation Research Program (AIRP) plan. Photographic coverage was obtained over portions of Louisiana and Mississippi with 12" focal length RC-10 cameras.

Minor cumulus cloud cover was encountered in the vicintiy of Lake Pontchartrain with the balance or the area virtually cloud-free. Because of the extensive area of coverage the first camera (034) was flown until the film supply was exhausted and the second camera (026) then utilized for the remainder of the flight. Camera 026 experienced underexposed data and fiducial lights and had erratic film transport metering, particularly during the first half of the roll. No other camera or processing problems were noted and the quality of the data is rated excellent.

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```

APPENDIX B
SPECTRAL PLOT SOFTWARE

CPLOT.TEXT B-2

KOM.TEXT B-4

INITIAL.TEXT B-5

KMDCHA.TEXT B-6

KMDCLASS.TEXT B-8

KMDDIS.TEXT B-11

KMDFIL.TEXT B-17

KMDHEAD.TEXT B-26

KMDRAD.TEXT B-27

KMDSPA.TEXT B-29

KMDSYM.TEXT B-31

GETOKEN.TEXT B-33

IMIN.TEXT B-40

```
MARYINC:
File:   CPLOT.TEXT          6  25-Jul-80


PROGRAM cplot (output);
{$8+}

  {History}
  {  J C Crisp   LEMSCO   04/03/80   Original Code}

  {Method}
  {  Get command and call appropriate command procedure.}

  {Exceptions}
  {  An invalid command generates a diagnostic message.}

VAR
  printer:TEXT;
  command:string[12];
  komd:string[12];   {first 3 characters of command}
  cr:char;

{Global declarations}
  (*$I MARYINC:KOM*)
  (*$I MARYINC:IMIN*)
  (*$I MARYINC:INITIAL*)
  (*$I MARYINC:GETOKEN*)
  (*$I MARYINC:KMDCHA*)
  (*$I MARYINC:KMDCLASS*)
  (*$I MARYINC:KMDDIS*)
  (*$I MARYINC:KMDFIL*)
  (*$I MARYINC:KMDHEAD*)
  (*$I MARYINC:KMDRAD*)
  (*$I MARYINC:KMDSPA*)
  (*$I MARYINC:KMDSYM*)

BEGIN
```

```
    rewrite (printer,'PRINTER:');
    reset(kmdfile,'console:');
    add := false;
    cr := chr(13);
    initial;
    writeln;
    write('user input :',cr,') ');
    getoken(command,   12);
    komd := copy(command,1,imin(length(command),3));
    WHILE komd () 'EXI' DO
      BEGIN
        IF komd = 'CHA'          (channel)
          THEN kmdcha(komd)
        ELSE IF komd = 'CLA'     (class)
          THEN kmdclass(komd)
        ELSE IF komd = 'DIS'     (display)
          THEN kmddis(komd)
        ELSE IF komd = 'FIL'     (file)
          THEN kmdfil(komd)
        ELSE IF komd = 'HEA'     (heading)
          THEN kmdhead(komd)
        ELSE IF komd = 'RAD'     (radiance)
          THEN kmdrad(komd)
        ELSE IF komd = 'SPA'     (spacing)
          THEN kmdspa(komd)
        ELSE IF komd = 'SYM'     (symbols)
          THEN kmdsym(komd)
        ELSE IF komd () blank
          THEN writeln('invalid command--',komd,cr);
        readcon;
        getoken(command,   12);
        komd := copy(command,1,imin(length(command),3));
      END;
    close (printer);
  END.
```

```
MARYINC:
File:    KOM.TEXT            4   25-Jul-80


 {KOM}

 CONST

   blank = ' ';
   comma = ',';

 TYPE

   doublechar = PACKED ARRAY[1..2] OF char;
   boolbyte = PACKED ARRAY[1..8] OF boolean;
   boolrow = PACKED ARRAY [1..72] OF boolbyte;

 VAR

   kmdfile:interactive;
   add:boolean;
   komcha:ARRAY[1..2] OF integer;
   komfile:string[20];
   komhead:PACKED ARRAY[1..72] OF char;
   komlabel:ARRAY[1..6] OF
            ARRAY[1..8] OF doublechar;
   komrmin:ARRAY[1..2] OF real;
   komrmax:ARRAY[1..2] OF real;
   komspa:ARRAY[1..2] OF real;
   komsym:PACKED ARRAY[1..8] OF char;
   komtable:PACKED ARRAY[1..127] OF boolrow;
```

```
MARYINC:
File:    INITIAL.TEXT        4  12-May-80


PROCEDURE initial;

CONST
  dblblank = '  ';

VAR
  i,J : inteser; (index for FOR loops)
  byte:boolbyte;
  initrow:boolrow;

BEGIN
  FOR i := 1 TO 8 DO
    byte[i] := false;
  FOR i := 1 TO 72 DO
    initrow[i] := byte;

  FOR i := 1 TO 127 DO
      komtable[i] := initrow;

  FOR i := 1 TO 8 DO
    komsym[i] := '0';

  FOR i := 1 TO 6 DO
    FOR J := 1 TO 8 DO
      komlabel[i,J] := dblblank;
END;
```

```
MARYINC:
File:    KMDCHA.TEXT          4  25-Apr-80


PROCEDURE KMDCHA(VAR KOMAND:STRING): (CHA)

(HISTORY)

(MARY ANN TOMPKINS LEMSCO 04/04/80 ORIGINAL CODE)

(METHOD)

(ESTABLISHES CURRENT CHANNELS TO  GRAPH)

(EXCEPTIONS)

(IF INVALID CHANNEL NUMBER ISSUE NOTE)
(IF CHANNEL NUMBER NOT SPECIFIED ISSUE NOTE)

VAR
  CHANUM : INTEGER: (COUNT OF CHANNELS)
  INTOKEN : INTEGER: (INTEGER TOKEN)

(PROCEDURE)

BEGIN
  KOMCHA[1] := 0;
  KOMCHA[2] := 0;
  KOMAND := BLANK;

  FOR CHANUM := 1 TO 2 DO
    BEGIN
      INTOKEN := 999;
      GETINT(INTOKEN);
        IF (INTOKEN < 1) OR (INTOKEN > 4)
          THEN
            BEGIN
              IF INTOKEN = 999
```

```
                THEN WRITELN('NO CHANNEL SPECIFICATION FOR CHANNEL ')
                ELSE WRITELN('IMPROPER CHANNEL NO. ',INTOKEN);
              WRITELN;
            END
          ELSE KOMCHA[CHANUM] := INTOKEN;
  END;
END;
```

```
MARYINC:
File:    KMDCLASS.TEXT       8  28-Apr-80


PROCEDURE KMDCLASS(VAR KOMAND:STRING); {CLA}

{HISTORY}

{MARY ANN TOMPKINS  LEMSCO  04/16/80  ORIGINAL CODE}

{METHOD}

{CHECK CLASS IF VALID (8)= CLASS )=1) ESTABLISH LABEL MAP TO CLASS}
{IN ARRAY. CHECK IF LABEL PREVIOUSLY DEFINED IF SO ISSUE NOTE.}

{EXCEPTIONS}

{FOR CLASS )8 OR <1 ISSUE NOTE & RETURN}
{FOR LABELS WITH LENGTH <> 2 ISSUE NOTE & RETURN}
{FOR PREVIOUSLY DEFINED LABEL ISSUE NOTE}

VAR
  LABELSTR : STRING[4]; {TWO CHARACTER LABEL}
  CLASSNUM : INTEGER; {DIGIT 1-8, KOMLABEL ROW INDEX}
  LABELNUM : INTEGER; {DIGIT 1-6, KOMLABEL COLUMN INDEX}
  ROW : INTEGER; {ROW INDEX}
  COLUMN : INTEGER; {COLUMN INDEX}
  PDEFINED : BOOLEAN; {PREVIOUS DEFINED LABEL}
  OK : BOOLEAN; {OK--CONTINUED PROGRAM FLOW}
  SAMELABEL : BOOLEAN; {TRUE--SAME LABEL}
  CR : CHAR; {CARRAGE RETURN}

BEGIN
  KOMAND := BLANK; {COMMAND CALLED}
  CLASSNUM := 99;
  OK := TRUE;
  CR := CHR(13);
```

```
(GET CLASSNUM IF 1(= DIGIT (= 8 CONTINUE)

GETINT(CLASSNUM);
IF(CLASSNUM ( 1) OR (CLASSNUM ) 8)
  THEN
    BEGIN
      IF CLASSNUM = 99
        THEN WRITELN ('NO CLASS DEFINITION')
        ELSE WRITELN('IMPROPER CLASS DEFINITION ',CLASSNUM,CR);
      OK := FALSE;
    END;

IF OK THEN
  BEGIN
    FOR LABELNUM := 1 TO 6 DO
       BEGIN
        LABELSTR := ' NUL';
        GETOKEN(LABELSTR,  4);
        PDEFINED := FALSE;
        IF LABELSTR = ' NUL'
          THEN LABELSTR := '   ';
        OK := (LENGTH(LABELSTR) = 2);
        IF NOT OK THEN
          WRITELN('IMPROPER LABEL DEFINITION',CR);

        IF OK THEN
          BEGIN
            KOMLABEL[LABELNUM,CLASSNUM,1] := LABELSTR[1];
            KOMLABEL[LABELNUM,CLASSNUM,2] := LABELSTR[2];

          IF LABELSTR () '   ' THEN
            BEGIN

              (CHECK FOR DOUBLE DEFINED VARIABLES)

              COLUMN := 1;
              WHILE (COLUMN (= 8) AND (NOT PDEFINED) DO
                BEGIN
                  ROW := 1;
                  WHILE (KOMLABEL[ROW,COLUMN,1] () BLANK) AND
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```
                        (NOT PDEFINED) AND (ROW <= 6) AND (OK) DO
                      BEGIN
                       SAMELABEL := ((ROW = LABELNUM)AND(COLUMN = CLASSNUM));
                       IF (NOT SAMELABEL) AND
                       (KOMLABEL[ROW,COLUMN,1] =
                           KOMLABEL[LABELNUM,CLASSNUM,1]) AND
                       (KOMLABEL[ROW,COLUMN,2] =
                           KOMLABEL[LABELNUM,CLASSNUM,2])
                          THEN
                            BEGIN
                              WRITELN(LABELSTR[1],LABELSTR[2],
                                     ' PREVIOUSLY DEFINED TO CLASS ',
                                     COLUMN,CR);
                              PDEFINED := TRUE;
                            END;
                        ROW := ROW + 1;
                        OK := (ROW <= 6);
                        IF NOT OK THEN
                         ROW := 6;
                      END;
                    COLUMN := COLUMN + 1;
                  END;
              END;
          END;
        END;(LABELNUM)
    END;
END;
```

```
MARYINC:
File:   KMDDIS.TEXT        14  13-Aug-80


PROCEDURE radscale;

{History}
{  J C Crisp     LEMSCO     04/16/80     Original code in Kmddis}
{  J C Crisp     LEMSCO     05/01/80     Make separate procedure}

{Method}
{  Subtract offset from radiance value, divide and truncate to obtain}
{ single digit.  Write digit.}

CONST
  decimal = '.';
  filler = '         ';

VAR
  maxcol100,mincol100:real;  {max and min column radiances*100}
  colrad100:real;    {column radiance*100}
  xspacing:real;     {spacing for x-axis}
  spac100:real;  {spacing*100}
  divisor:real;  {divisor for creating radiance scale}
  divcount:integer;  {division counter}
  offset:real;   {offset for creating radiance scale}
  offsetdiv:real;  {divisor to obtain offset}
  dividend:real;  {column radiance-offset}
  digit:integer;  {digit to be printed for radiance scale}

{Procedure}

BEGIN
  mincol100 := Komrmin[2]*100;
  maxcol100 := Komrmax[2]*100;
  xspacing := 1/Komspa[2];
  spac100 := xspacing*100;
  divcount := 0;
```

```
    offsetdiv := 1;
    divisor := 10000;
    WHILE divisor >= 1 DO
      BEGIN
        colrad100 := mincol100;
        IF divcount <> 3
          THEN write (printer,filler)
          ELSE write (printer,'  chan ',komcha[2]);
        WHILE colrad100 <= maxcol100 DO
          BEGIN
            offset := 0;
            IF divcount = 3
              THEN
                write (printer,decimal)
              ELSE
                BEGIN
                  IF offsetdiv <> 1
                    THEN offset := trunc(colrad100/offsetdiv);
                  dividend := colrad100-(offset*offsetdiv);
                  digit := trunc(dividend/divisor);
                  IF (divcount < 3) OR (trunc(xspacing) <> xspacing)
                    THEN write (printer,digit);
                END;
            colrad100 := colrad100+spac100;
          END;
        IF divcount <> 3
          THEN
            BEGIN
              divisor := divisor/10;
              offsetdiv := divisor*10;
            END;
        divcount := divcount+1;
        writeln (printer);
      END;
  END;

  {*****************************************************************************}

  PROCEDURE Kmddis (VAR Komand:string);
```

```
{History}
{  J C Crisp     LEMSCO     04/16/80     Original code}

{Method}
{  Check that symbols command has been called.  Traverse komtable row by}
{row, from max to min, writing symbol or count for each column.}

{Exceptions}
{  The symbol command must have been entered prior to issuing this command.}

CONST
  colon = ':';

VAR
  colbits:boolean;
  maxrowrad,minrowrad:real;  {max and min row radiance}
  maxcolrad,mincolrad:real;  {max and min column radiance}
  maxrow,maxcol:integer;   {max row and column in komtable}
  rowrad,colrad:real;   {radiance for row and column of graph}
  lastcol:integer;   {last column to be printed}
  xspacing,yspacing:real;  {spacing for x and y axes}
  yincrmnt:real;  {increment for y-axis}
  symbol:char;   {symbol from symbol table to be printed}
  count:integer;  {counter}
  cr:char;   {carriage return}
  vt:char;   {vertical tab}
  klass:integer;  {index into symbol table}
  row,col,bit:integer;   {indices into komtable}
  symfound:boolean;  {flag to if current symbol has been previously used}
  i:integer;

{Procedure}

BEGIN
  cr := chr(13);
  vt := chr(11);

  {check if symbols command has been entered}
  count := 0;
  FOR klass := 1 TO 8 DO
```

```
  IF komsym[klass] () '0'
    THEN count := count+1;
IF count = 0
  THEN
    writeln ('symbols have not been entered',cr)
  ELSE
    BEGIN
      write (printer,cr,vt);writeln (printer); {cr,vt--page eject on printer}
      FOR i := 1 TO 72 DO
        write (printer,komhead[i]);
      writeln (printer);

      {write classes and associated symbols}
      write (printer,'                    class   ');
      FOR klass := 1 TO 8 DO
        IF komsym[klass] () '0'
          THEN write (printer,klass,'  ');
      writeln (printer);

      write (printer,'                    symbol  ');
      FOR klass := 1 TO 8 DO
        IF komsym[klass] () '0'
          THEN write (printer,komsym[klass],'  ');
      writeln (printer);

      writeln (printer,'  chan ',komcha[1]);

      {initialize max & min radiances, rows & columns}
      yspacing := komspa[1];
      xspacing := komspa[2];
      yincrmnt := 1/yspacing;
      maxrowrad := komrmax[1];
      maxcolrad := komrmax[2];
      minrowrad := komrmin[1];
      mincolrad := komrmin[2];
      maxrow := round((maxrowrad-minrowrad)*yspacing+1);
      maxcol := round((maxcolrad-mincolrad)*xspacing+1);
      rowrad := ((maxrow-1)*yincrmnt)+minrowrad;

      {traverse komtable, writing symbols or count}
```

```
FOR row := maxrow DOWNTO 1 DO
  BEGIN
    write (printer,rowrad:7:2);
    write (printer,colon);
    lastcol := maxcol;
    colbits := false;
    WHILE (NOT colbits) AND (lastcol)1) DO
      BEGIN
        FOR bit := 1 TO 8 DO
          colbits := colbits OR komtable[row,lastcol,bit];
        IF NOT colbits THEN lastcol := lastcol-1;
      END;
    FOR col := 1 TO lastcol DO
      BEGIN
        count := 0;
        symbol := blank;
        FOR bit := 1 TO 8 DO
          BEGIN
            IF komtable[row,col,bit] THEN
              BEGIN
                symfound := false;
                IF komsym[bit]()blank THEN
                  symbol := komsym[bit];
                klass := 1;
                WHILE (NOT symfound) AND (klass(bit) DO
                  BEGIN
                    IF (komsym[klass]=symbol) AND
                       (komtable[row,col,klass])
                      THEN symfound := true;
                    klass := klass+1;
                  END;
                IF (NOT symfound) AND (komsym[bit]()blank)
                  THEN count := count+1;
              END;
          END;
        IF count)1
          THEN write (printer,count)
          ELSE write (printer,symbol);
      END;
    rowrad:= rowrad-yincrmnt;
```

```
            writeln (printer);
          END;

        {write line of colons}
        write (printer,'        ',colon);
        FOR col := 1 TO maxcol DO
          write (printer,colon);
        writeln (printer);

        {write radiance scale for x-axis}
        radscale;

        write (printer,cr,vt);
    END;
  komand := blank;
END;
```

```
MARYINC:
File:    KMDFIL.TEXT        18    1-Aug-80


  PROCEDURE CONFIRM;

  {HISTORY}

  {MARY ANN TOMPKINS LEMSCO 04/25/80 ORIGINAL CODE}

  {METHOD}

  {WRITES THE TABLE OF LABEL MAPPING TO CLASSES}

  {EXCEPTIONS}

  {NONE}

  VAR

    COLUMN,ROW,I : INTEGER ; {KOMLABEL[COLUMN,ROW]}
    CR : CHAR; {CARRAGE RETURN}
    VT : CHAR; {VERTICAL TAB}

  BEGIN

    CR := CHR(13);
    VT := CHR (11);
    COLUMN := 0;
    WRITE(CR,VT);     {CR,VT CAUSES A PAGE EJECT ON LINE PRINTER}
    FOR I := 1 TO 72 DO
      WRITE (KOMHEAD[I]);
    WRITELN;WRITELN;
    WRITELN('CLASS  LABEL(S) MAPPING TO CLASS');

    REPEAT
      COLUMN := COLUMN + 1;
```

```
      IF KOMLABEL[1,COLUMN,1] <> BLANK
        THEN
          BEGIN
            WRITE(COLUMN,'       ');
            ROW := 0;
              REPEAT
                BEGIN
                  ROW := ROW + 1;
                  WRITE(KOMLABEL[ROW,COLUMN],'   ');
                END;
              UNTIL ROW = 6;
              WRITELN;
            END;
      UNTIL COLUMN = 8;

    END;

  {*************************************************************************}

PROCEDURE KMDFIL(VAR KOMAND : STRING); {FIL}

{HISTORY}

{MARY ANN TOMPKINS LEMSCO 04/25/80 ORIGINAL CODE}

{METHOD}

{READ FILENAME AND CONFIRM LABEL MAPPING TO CLASSES. CHECK LENGTH OF}
{FILENAME (= 10. APPEND ADDITIONAL INFORMATION TO FILENAME AND ATTEMPT}
{TO OPEN FILE. IF SUCESSFUL PRINT DATA FOR CLUSTER MEANS OF SPECIFIED }
{CHANNELS THAT FALL WITHIN RADIANCE/SPACING RANGE. UPDATE KOMTABLE}
{ACCORDING TO PRIMARY LABEL OR IF PRESENT SCONDARY LABEL WHICH IS }
{CURRENTLY MAPPED TO A CLASS.}

{EXCEPTIONS}

{1. IF RADIANCE WITH CURRENT SPACING IS OUTSIDE KOMTABLE ARRAY ISSUE
    NOTE AND RETURN.}
{2. IF LENGTH(FILENAME) > 10 ISSUE NOTE AND RETURN.}
{3. IF THERE IS AN IO ERROR ON OPENING FILE ISSUE NOTE AND RETURN.}
```

```
VAR
  DATAFILE : INTERACTIVE;
  OK : BOOLEAN; (TRUE--CONTINUE)
  RANGE : INTEGER; (ARRAY INDEX FOR PAGE RANGE CHECK)
  DELTA : REAL; ( DELTA AS FUNCTION OF SPACING FOR CHANNELS)
  FILENAME : STRING[25]; (FILENAME--MAX 10 CHAR)
  DELTAMAX : ARRAY[1..2] OF REAL; (MAX DELTA OF RADIANCES WITH SPACING)
  PRILABEL : PACKED ARRAY[1..2] OF CHAR; (PRIMARY LABEL)
  SECLABEL : PACKED ARRAY[1..2] OF CHAR; (SECONCARY LABEL)
  CHARACTER : CHAR; (ONE CHAR)
  CLUSTERNO : INTEGER; (CLUSTER NUMBER)
  CLMEAN : ARRAY[1..4] OF REAL; (CLUSTER MEANS FOR CHANNEL)
  PIXELNO : INTEGER; (NUMBER OF PIXELS IN CLUSTER)
  IO : INTEGER; (IO ERROR RESULTS)

  (*************************************************************************)

  PROCEDURE UPDATE;

  (HISTORY)

  (MARY ANN TOMPKINS LEMSCO 04/25/80 ORIGINAL CODE)

  (METHOD)

  (CHECK KOMTABLE TO DETERMINE IF PRESENT DATA LABEL IS MAPPED)
  (TO A CLASS. IF LABEL IS REQUESTED (PRESENT IN KOMTABLE))
  (UPDATE THE BIT MATRIX (KOMTABLE))

  (EXCEPTIONS)

  (NONE)

  VAR
    COLUMN,ROW : INTEGER; (KOMTABEL[COLUMN,ROW])
    REQLABEL : BOOLEAN; (TRUE--LABEL MAPPED)
    CLASS : INTEGER; (CLASS--LABEL MAPPED TO)
    XAXIS,YAXIS : INTEGER; (COORDINANTS OF KOMTABLE ARRAY)
    OK : BOOLEAN; (INDEX WITHIN ARRAY)
```

```
BEGIN
  REQLABEL := FALSE;
  COLUMN := 1;
    WHILE (COLUMN <= 8) AND (NOT REQLABEL) DO
      BEGIN
        OK := TRUE;
        ROW := 1;
        WHILE (KOMLABEL[ROW,COLUMN,1] <> BLANK) AND (NOT REQLABEL)
                AND (ROW <= 6) AND (OK) DO
                  BEGIN
                    IF SECLABEL <> '  '
                      THEN
                        REQLABEL := (KOMLABEL[ROW,COLUMN] = SECLABEL)
                      ELSE
                        REQLABEL := (KOMLABEL[ROW,COLUMN] = PRILABEL);
                    IF REQLABEL THEN
                      CLASS := COLUMN;
                    ROW := ROW + 1;
                    OK := (ROW <= 6);
                    IF NOT OK THEN
                      ROW := 6;
                  END;
          COLUMN := COLUMN + 1;
        END;

    IF REQLABEL THEN
      BEGIN
        YAXIS := ROUND((CLMEAN[KOMCHA[1]]-KOMRMIN[1])*KOMSPA[1]+1.0);
        XAXIS := ROUND((CLMEAN[KOMCHA[2]]-KOMRMIN[2])*KOMSPA[2]+1.0);
        KOMTABLE[YAXIS,XAXIS,CLASS] := TRUE;
      END;
END;

{*************************************************************************}

 PROCEDURE READFILE;

 {HISTORY}
```

```
{MARY ANN TOMPKINS LEMSCO 04/25/80 ORIGINAL CODE}

{METHOD}

{READS AN OPEN FILE AND WRITES THAT DATA WHICH FALLS WITHIN THE}
{SPECIFICATION OF THE RADIANCE/SPACING COMMANDS. CALLS UPDATE }
{OPITIONAL OUTPUT}
  {1. SECONDARY LABELS IF PRESENT DEFINE CURRENT LABEL }
  {2. CLUSTER NUMBER = 99 DENOTE COMMENTS AND ARE PRINTED
   3.)   ( DENOTES A COMMENT AND MAY FALL ANYWHERE ON A LINE AFTER
      A PRIMARY LABEL}

VAR
 DATATRUE : BOOLEAN; {TRUE--DATA IS IN REQUESTED RANGE}
 COMMENT : BOOLEAN; {TRUE--COMMENTS}
 COUNT : INTEGER; {INDEX TO BUILD COMMENT STRING}
 I : INTEGER; {INDEX FOR PRINTING CLUSTER VALUES FOR EACH CHANNEL}
 CR : CHAR; {CARRAGE RETURN}
 COMSTRING : STRING[40]; {COMMENT STRING}
 ONECHRST : STRING[1]; {STRING OF LENGTH 1 USES TO INSERT CHAR}

BEGIN

  CR := CHR(13);
  WRITELN;
  WRITELN(FILENAME,' CLUSTER MEANS',CR,' #      CH 1     CH 2     CH 3',
          '     CH 4 #PX PLB SLB');

  {READ DATA SEQUENTIAL UNTIL EOF}
  {CLUSTER NO. 99 DENOTES COMMENTS--PRINT }

  WHILE NOT EOF(DATAFILE) DO
    BEGIN
      READ(DATAFILE,CLUSTERNO);
      PRILABEL := '  ';
      SECLABEL := '  ';
      COMSTRING := ''; {NULL STRING}
      COUNT := 0;
      COMMENT := FALSE;
      IF(CLUSTERNO <> 99) AND (NOT EOF(DATAFILE)) THEN
```

```
BEGIN
  (READ NUMERIC DATA AND IF DATATRUE IS REQUESTED DATA)

  READ(DATAFILE,CLMEAN[1],CLMEAN[2],CLMEAN[3],CLMEAN[4],
       PIXELNO);
  DATATRUE := ( (CLMEAN[KOMCHA[1]])=KOMRMIN[1]) AND
              (CLMEAN[KOMCHA[1]](=KOMRMAX[1]) AND
              (CLMEAN[KOMCHA[2]])=KOMRMIN[2]) AND
              (CLMEAN[KOMCHA[2]](=KOMRMAX[2]));
  IF DATATRUE THEN
    BEGIN

      (LOCATE PRIMARY LABEL)
      CHARACTER := BLANK;

      WHILE (CHARACTER = BLANK) AND (NOT EOLN(DATAFILE)) DO
        READ(DATAFILE,CHARACTER);
        IF NOT EOLN(DATAFILE) THEN
          BEGIN
            PRILABEL[1] := CHARACTER;
            READ(DATAFILE,CHARACTER);
            PRILABEL[2] := CHARACTER;
          END;

      (LOCATE SECONDARY LABEL IF ANY)
      CHARACTER := BLANK;

      WHILE (CHARACTER = BLANK) AND (NOT EOLN(DATAFILE)) DO
        READ(DATAFILE,CHARACTER);

      COMMENT := (CHARACTER  = '(');

      (SECONDARY LABEL)
      IF (NOT COMMENT) AND (CHARACTER <> BLANK) THEN
        BEGIN
          SECLABEL[1] :=CHARACTER;
          READ(DATAFILE,CHARACTER);
          SECLABEL[2] := CHARACTER;
        END;
```

```
            {CHECK FOR COMMENTS AFTER A SECONDARY LABEL}

          WHILE (NOT EOLN(DATAFILE)) AND (NOT COMMENT) DO
            BEGIN
              READ(DATAFILE,CHARACTER);
              COMMENT := (CHARACTER = '(');
            END;

          {COMMENTS}
          IF COMMENT THEN
            BEGIN
              WHILE NOT EOLN(DATAFILE) DO
                BEGIN
                  ONECHRST := '?'; {SO IT HAS LOGICAL LENGTH OF ONE}
                  READ(DATAFILE,CHARACTER);
                  COUNT := COUNT + 1;
                  ONECHRST[1] := CHARACTER;
                  INSERT(ONECHRST,COMSTRING,COUNT);
                END;
              INSERT('(',COMSTRING,1);
            END;
           WRITE(CLUSTERNO:3,' ');
           FOR I := 1 TO 4 DO
           WRITE(CLMEAN[I]:7:2,' ');
           WRITE(' ',PIXELNO:2,'  ',PRILABEL,'  ',SECLABEL,' ');
           WRITE(COMSTRING);

           {UPDATE BIT MATRIX}
           UPDATE;
           WRITELN;
        END; {IF DATATRUE}
END; {NOT 99,EOF}
IF CLUSTERNO = 99
  THEN
    BEGIN
      WHILE NOT EOLN(DATAFILE) DO
       BEGIN
         READ(DATAFILE,CHARACTER);
         WRITE(CHARACTER);
       END;
```

```
                WRITELN;
              END; {CLUSTERNO = 99}
            READLN(DATAFILE);
        END; {NOT EOF}
        CLOSE(DATAFILE);
END;


   {*************************************************************************}


{PROCEDURE KMDFIL}


BEGIN
  KOMAND := BLANK;
  DELTAMAX[1] := 127.0;
  DELTAMAX[2] := 72.0;
  OK := TRUE;

  GETOKEN(FILENAME,  13);

  {COMFIRM LABEL(S) MAPPING TO CLASS}
  CONFIRM;

  {DETERMINE IF WHEN USING INPUT SPACING THE MIN & MAX FOR SPECIFIED}
  {CHANNELS ARE WITHIN RANGE OF KOMTABLE ARRAY}

  FOR RANGE := 1 TO 2 DO
    BEGIN
      DELTA := (KOMRMAX[RANGE]-KOMRMIN[RANGE])*KOMSPA[RANGE] + 1;
      IF DELTA ) DELTAMAX[RANGE]THEN
          BEGIN
            WRITELN('ADJUST MIN/MAX OR SPACING FOR CHANNEL ',
                          KOMCHA[RANGE]);
            OK := FALSE;
          END;
   END; {RANGE}

   IF OK THEN
```

```
      BEGIN
        OK := (LENGTH(FILENAME) <= 10); {MAX LENGTH 10 CHAR}
        IF OK THEN
          BEGIN
            INSERT('#5:',FILENAME,1);
            INSERT('.TEXT',FILENAME,(LENGTH(FILENAME)+1));
            {$I-} {operating system won't check I/O status}
              RESET(DATAFILE,FILENAME);
              IO := IORESULT;
            {$I+} {operating system resumes checking I/O status}
            OK := (IO = 0);
            IF NOT OK THEN
              BEGIN
                WRITELN('IO ERROR # ',IO,' ON OPENING ',FILENAME,' FILE');
                WRITELN;
              END;
          END
        ELSE
          BEGIN
            WRITELN(FILENAME,' TOO.... LONG');
            WRITELN;
          END;
      END; {OUTER IF OK}

    IF OK THEN

    {READ FILE}
    READFILE;
  END;
```

```
MARYINC:
File:    KMDHEAD.TEXT        4  29-Jul-80


PROCEDURE kmdhead (VAR komand:string);

{History}
{  J C Crisp      LEMSCO      07/25/80      Original code}

{Method}
{  Read heading text from input file and store as packed array of chars.}

VAR
  character:char;
  count,i:integer;

BEGIN
  count := 1;
  FOR i := 1 TO 72 DO
    komhead[i] := blank;
  WHILE NOT eoln(kmdfile) DO
    BEGIN
      read (kmdfile,character);
      komhead[count] := character;
      count := count+1;
    END;
  komand := blank;
END;
```

```
MARYINC:
File:    KMDRAD.TEXT        6  12-May-80


PROCEDURE Kmdrad(VAR Komand:strins);

  {History}
  {  J C Crisp   LEMSCO   04/04/80   Orisinal Code}

  {Method}
  {  Get minimum & maximum radiance values for each channel to be sraphed}

  {Exceptions}
  {  If radiance is out of ranse, a warnins will be senerated.}
  {  If minimum sreater than maximum, a warnins will be senerated.}
  {  If a radiance specification is missins, a warnins will be senerated.}

VAR
  maxrad:real;  {maximum radiance}
  numcha:integer;   {number of channels allowed}
  rltokmin,rltokmax:real;   {real token for min & max radiances}
  chanum:integer;   {count of channels}
  cr:char;    {carriase return}

{Procedure}

BEGIN
  maxrad := 127;
  numcha := 2;
  cr := chr(13);
  FOR chanum := 1 TO numcha DO
    BEGIN
      rltokmin := 999;
      rltokmax :=999;
      setreal(rltokmin);
      setreal(rltokmax);
      IF (rltokmin=999) OR (rltokmax=999)
        THEN writeln ('missins radiance specification',cr)
```

```
            ELSE
              BEGIN
                IF chanum = 2
                  THEN maxrad := 72;
                IF (rltokmin < 0) OR (rltokmin > maxrad)
                  THEN writeln('radiance out of range--',rltokmin,cr)
                  ELSE IF (rltokmax < 0) OR (rltokmax > maxrad)
                    THEN writeln('radiance out of range--',rltokmax,cr)
                    ELSE IF rltokmin > rltokmax
                      THEN writeln('min radiance > max',cr)
                      ELSE
                        BEGIN
                          komrmin[chanum] := rltokmin;
                          komrmax[chanum] := rltokmax
                        END;
              END;
        END;
      komand := blank;
    END;
```

```
MARYINC:
File:    KMDSPA.TEXT          4  30-Apr-80


PROCEDURE kmdspa (VAR komand:string);

{History}
{  J C Crisp     LEMSCO     04/17/80     Original code}

{Method}
{  Get spacing increment, check for validity, and store as reciprocal.}

{Exceptions}
{  Spacing out of range (.2 to 5) will cause a warning.}
{  A missing spacing specification will cause a warning.}

VAR
  spacing:real;    {spacing increment--stored as reciprocal}
  numcha:integer;  {number of channels}
  chanum:integer;  {channel number}
  cr:char;    {carriage return}

{Procedure}

BEGIN
  numcha := 2;
  cr := chr(13);
  FOR chanum := 1 TO numcha DO
    BEGIN
      spacing := 999;
      getreal (spacing);
      IF spacing=999
        THEN writeln ('missing spacing specification',cr)
        ELSE
          IF (spacing < 0.2) OR (spacing > 5)
            THEN writeln ('spacing out of range--',spacing,cr)
            ELSE komspa[chanum] := 1/spacing;
    END;
```

```
  komand := blank;
END;
```

```
MARYINC:
File:    KMDSYM.TEXT        6  30-Apr-80


PROCEDURE kmdsym (VAR komand:string);

{History}
{  J C Crisp   LEMSCO   04/09/80   Original code}

{Method}
{  Get symbol and classes to be represented by symbol.  Store symbol in}
{symbol table.}

{Exceptions}
{  1. Numeric symbols are not allowed.}
{  2. If no symbol is entered with the symbol command, a warning will be}
{     issued.}
{  3. A null class list will generate a warning.}

VAR
  symbichek:integer;  {numeric value of symbol character}
  token:string[4];    {symbol string}
  tokenlen:integer;   {length of token}
  calls:integer;      {count of calls to get class(es)}
  symbol:char;        {symbol to be stored}
  klass:integer;      {class(es) associated with symbol}
  cr:char;    {carriage return}

{Procedure}

BEGIN
  cr := chr(13);
  tokenlen := 4;
  token := ' nul';
  getoken (token,   tokenlen);
  IF token = ' nul'
    THEN writeln ('no symbol entered with symbol command',cr)
    ELSE
```

```
    IF length (token) ) 1
      THEN writeln ('invalid symbol--',token,cr)
      ELSE
        BEGIN
          symbol := token[1];
          symbichek := ord(symbol)-ord('0');
          IF (symbichek)=0) AND (symbichek(=9)
            THEN writeln ('numeric symbol not allowed',cr)
            ELSE
              BEGIN
                klass := maxint;
                getint (klass);
                calls := 1;
                WHILE (klass () maxint) AND (calls ( 9) DO
                  BEGIN
                    IF (klass ( 1) OR (klass ) 8)
                      THEN writeln ('invalid class--',klass,cr)
                      ELSE komsym[klass] := symbol;
                    klass := maxint;
                    getint (klass);
                    calls := calls + 1;
                  END;
                IF (klass = maxint) AND (calls = 1)
                  THEN writeln ('null class list not allowed',cr)
              END;
        END;
  komand := blank;
END;
```

```
MARYINC:
File:    GETOKEN.TEXT       14  28-Apr-80


  {*************************************************************************}

  PROCEDURE READCON;

  {HISTORY}

  {MARY ANN TOMPKINS  LEMSCO   04/03/80   ORIGINAL CODE}

  {METHOD}

  {POSITIONS TO A BEGINNING OF NEW INPUT LINE}

  {PROCEDURE}

  BEGIN
    READLN(KMDFILE);
    WRITE(') ')
  END;

  {*************************************************************************}

  FUNCTION UPCHAR(BYTE:CHAR):CHAR;
    BEGIN
      IF(BYTE < 'a') OR (BYTE > 'z')
        THEN UPCHAR := BYTE
        ELSE UPCHAR := CHR(ORD(BYTE) - 32);
      END;

{*************************************************************************}

PROCEDURE GETOKEN(VAR TOKEN:STRING; {CHARACTER STRING TOKEN}
                      TOKENLEN:INTEGER); {REQUESTED TOKEN COUNT}

{HISTORY}
```

```
(MARY ANN TOMPKINS  LEMSCO  03/27/80  ORIGINAL CODE)

(METHOD)

(THIS PROCEDURE GETS ALL FREE-FORMAT DATA FIELDS.)

   (FREE-FORMAT INPUT RULES)
      (1. LINES -- AN INPUT LINE CONTAINS UP TO 80 CHARACTERS)
      (   TERMINATED BY A CARRIAGE RETURN                    )
      (2. DELIMITERS -- , ENDS DATA FIELD (NEXT DATA FIELD FOLLOWS)
      (3. FIELDS -- EACH DATA FIELD IS COMPOSED OF A SIGNFICANT AND)
      (   A NON-SIGNIFICANT PART. THE SIGNIFICANT PART IS DETERMINED)
      (   BY A SPECIFIED MAXIMUM COUNT. ALL BLANKS AND NON-)
      (   SIGNIFICANT PARTS ARE IGNORED.)
   (IF GETOKEN IS CALLED IMEDIATELY AFTER EOLN THEN TOKEN IS UNCHANGED)
   (IF LENGTH (TOKEN) = 0 A BLANK IS RETURNED)


VAR
  CHARACTER : CHAR; (ONE CHARACTER)
  COUNT : INTEGER; (POSITION IN STRING OF CHAR)
  ONECHRST : STRING[1];
  CR : CHAR; (CARRIAGE RETURN)

BEGIN
  IF NOT EOLN(KMDFILE)THEN
    BEGIN
     TOKEN:= '';  (BEGIN WITH NULL STRING)
     COUNT:= 1;
     CR := CHR(13);
     CHARACTER:= '*'; (INSURE THAT CHARACTER <> COMMA FIRST TIME)

  (BREAK WHEN TOKEN FIELD ENDS OR EOLN ENCOUNTERED)

     WHILE (CHARACTER <> COMMA) AND (NOT EOLN(KMDFILE)) DO
        BEGIN
           READ(KMDFILE,CHARACTER);
              IF EOF(KMDFILE) THEN
                BEGIN
```

```
                    IF ADD
                     THEN
                       BEGIN
                         RESET(KMDFILE,'CONSOLE');
                         ADD := FALSE;
                       END
                     ELSE
                       WRITELN('END-OF-FILE FROM CONSOLE NOT RECOGNIZED',CR)
                   END;

  {BUILD TOKEN TO INPUT COUNT IGNORING BLANKS}

            IF (CHARACTER <> BLANK) AND (COUNT <= TOKENLEN)
                AND (CHARACTER <> COMMA) THEN
               BEGIN
                 ONECHRST := '?';    {SO IT HAS A LOGICAL LENGTH OF 1}
                 ONECHRST[1] := UPCHAR(CHARACTER);
                 INSERT(ONECHRST,TOKEN,COUNT);
                 COUNT:= COUNT + 1
               END;
        END;
        IF LENGTH(TOKEN) = 0
          THEN TOKEN := BLANK;
    END;
  END;

  {*************************************************************************}

PROCEDURE GETINT( VAR INTOKEN: INTEGER); {INTEGER VALUE}

{HISTORY}

{MARY ANN TOMPKINS  LEMSCO  04/03/80  ORIGINAL CODE}

{METHOD}

{BUILDS AN INTEGER FROM A CHARACTER TOKEN UNTIL TOKEN = ' NUL' IS }
{RETURNED FROM GETOKEN}

{EXCEPTIONS}
```

```
{IF TOKEN(I) () DIGIT ISSUE NOTE}
{ALLOWABLE TOKEN COUNT IS 5 CHARACTERS}

VAR
   TOKEN : STRING[10]; {CHARACTER STRING TOKEN}
   DIGIT : INTEGER; {DIGIT 0-9}
   I : INTEGER; {DIGIT COUNTER}
   COUNT : INTEGER; {POSITION POINTER TO TOKEN STRING}
   CR : CHAR; {CARRAGE RETURN}
   INTEMP : INTEGER; {TEMP. STORAGE FOR OUTPUT}
   FALSETKN : BOOLEAN; {FALSE-- CHANGE}

{PROCEDURE}

BEGIN
  TOKEN := ' NUL';
  GETOKEN(TOKEN,   10);
  IF TOKEN () ' NUL' THEN
    BEGIN
     COUNT := 1;
     CR := CHR(13);
     INTEMP := 0;
     FALSETKN := FALSE;

     IF LENGTH(TOKEN) (= 5
       THEN
         BEGIN
           FOR I := 1 TO LENGTH(TOKEN) DO
             BEGIN
               DIGIT := ORD(TOKEN[COUNT]) - ORD('0');
               IF (DIGIT ) 9) OR (DIGIT ( 0)
                 THEN
                   BEGIN
                     IF NOT FALSETKN
                       THEN
                         BEGIN
                           WRITELN(TOKEN,' ILLEGAL INTEGER VARIABLE',CR);
                           FALSETKN := TRUE;
                         END;
```

```
                    END
                  ELSE
                    BEGIN
                      INTEMP := INTEMP*10 + DIGIT;
                      COUNT := COUNT + 1;
                    END;
                END;
            END
          ELSE
            WRITELN('MAXIMUM NUMBER OF DIGITS EXCEEDED',CR);
            IF NOT FALSETKN
              THEN INTOKEN := INTEMP;
      END;
  END;

  {*************************************************************************}

PROCEDURE GETREAL( VAR RLTOKEN : REAL); {REAL VALUE}

{HISTORY}

{MARY ANN TOMPKINS  LEMSCO  04/04/80  ORIGINAL CODE}

{METHOD}

{BUILDS A REAL NUMBER FROM A CHARACTER TOKEN UNTIL TOKEN = ' NUL' ON}
{RETURN FOR GETOKEN.}

{EXCEPTIIONS}

{IF TOKEN(I) () DIGIT OR TOKEN(I) () . ISSUE NOTE}
{ALLOWABLE TOKEN COUNT IS 8 CHARACTER}

CONST
  DEC = '.';

VAR
  POINT : BOOLEAN; {REPRESENT DECIMAL POINT}
  DECPLACE : INTEGER; {NO OF DIGITS RIGHT OF DECIMAL POINT}
  CONVERT : INTEGER; {SCALE BY DECPLACE}
```

```
  COUNT : INTEGER; {POSITION POINTER TO TOKEN STRING}
  CR : CHAR; {CARRAGE RETURN}
  DIGIT : INTEGER; {DIGIT 0-9}
  TOKEN : STRING[10]; {CHARACTER STRING TOKEN}
  I : INTEGER; {DIGIT COUNTER}
  RLTEMP : REAL; {TEMP STORAGE FOR REAL OUTPUT}
  FALSETKN : BOOLEAN; {FALSE --  CHANGE}

{PROCEDURE}

BEGIN
  TOKEN := ' NUL';
  GETOKEN(TOKEN,  10);
  IF TOKEN () ' NUL' THEN
    BEGIN
      COUNT := 1;
      POINT := FALSE;
      DECPLACE := 0;
      CR := CHR(13);
      RLTEMP := 0.0;
      FALSETKN := FALSE;

      IF LENGTH(TOKEN) (= 8
      THEN
        FOR I := 1 TO LENGTH(TOKEN) DO
          BEGIN
            IF TOKEN[COUNT] () DEC
              THEN
                BEGIN
                  DIGIT := ORD(TOKEN[COUNT]) - ORD('0');
                  IF(DIGIT ) 9) OR (DIGIT ( 0)
                    THEN
                     BEGIN
                        IF NOT FALSETKN THEN
                          BEGIN
                            WRITELN(TOKEN,' ILLEGAL FOR A REAL VARIABLE',CR);
                            FALSETKN := TRUE;
                          END;
                     END
                    ELSE
```

```
                        BEGIN
                          RLTEMP := RLTEMP*10 + DIGIT;
                          COUNT := COUNT + 1;
                          IF POINT
                           THEN DECPLACE := DECPLACE + 1;
                        END;
                    END
                  ELSE
                    BEGIN
                    POINT := TRUE;
                    COUNT := COUNT + 1;
                  END;
              END
            ELSE
              WRITELN('MAXIMUM ALLOWABLE DIGITS EXCEEDED',CR);

          {RESTORE NUMBER TO PROPER DEGREE}

            IF NOT FALSETKN
              THEN
                BEGIN
                  RLTOKEN := RLTEMP;
                    FOR CONVERT := 1 TO DECPLACE DO
                      RLTOKEN := RLTOKEN/10;
                END
            END;
END;
```

```
MARYINC:
File:    IMIN.TEXT          4  13-May-80


  FUNCTION IMIN(i,J:integer):integer;  (Integer MINimum of 2 integers)

    (HISTORY)
      (E H Schlosser    LEMSCO  13-May-80       Original code)

    BEGIN
      IF i(J THEN IMIN := i
      ELSE IMIN := J;
    END;
```

APPENDIX C
SPECTRAL PLOT DATA

LEGEND FOR PIXEL LABELS C-2

SAMPLE INPUT DATA FILE C-3

COMMAND FILE C-4

PLOT OF CHANNEL 4 VERSUS 1 . . . . . C-6

PLOT OF CHANNEL 4 VERSUS 2 . . . . . C-8

PLOT OF CHANNEL 3 VERSUS 1 . . . . . C-10

PLOT OF CHANNEL 3 VERSUS 2 . . . . . C-12

PLOT OF CHANNEL 4 VERSUS 3 . . . . . C-14

LIST1:
File: LEGEND.TEXT 4 24-Jul-80

LEGEND FOR PIXEL LABELS

CL = Cloud

SH = Shadow

BS = Bare Soil

SD = Sand Dunes

WL = Wetlands

PA = Pavement

BR = Building Roofs

CO = Commercial

IN = Industrial

DT = Downtown

TP = Treatment Ponds

RL = River Light Blue

RM = River Medium Blue

RD = River Dark Blue

PL = Pond Light Blue

PM = Pond Medium Blue

PD = Pond Dark Blue

LL = Lake Light Blue

LM = Lake Medium Blue

LD = Lake Dark Blue

MX = Mixture pixels

```
LIST1:
File:    WH-NY-070.TEXT      6  11-Aug-80


 99 WH-NY-070 PIXEL VALUES FOR CHANNELS: 1,2,3,4
501   22   13   07   03   01   LD  (1285,2307)
501   21   13   12   03   01   LD  (1286,2305)
501   26   19   16   04   01   LD  (1286,2313)
501   21   15   13   04   01   LD  (1287,2304)
501   21   15   14   05   01   LD  (1287,2308)
501   21   18   14   06   01   LD  (1287,2309)
501   25   20   14   03   01   LD  (1287,2312)
501   22   16   13   04   01   LD  (1288,2305)
 70   24   13   14   04   01   LD  (1331,2519)
 70   24   15   13   05   01   LD  (1331,2520)
 70   22   13   13   05   01   LD  (1332,2520)
 88   19   13   12   04   01   LD  (1345,2494)
 88   18   13   12   04   01   LD  (1345,2495)
 88   18   13   12   03   01   LD  (1346,2494)
 74   21   15   13   04   01   LD  (1353,2519)
 74   22   16   13   03   01   LD  (1354,2519)
 74   20   15   13   04   01   LD  (1355,2520)
 74   21   13   12   03   01   LD  (1356,2519)
 74   20   13   11   03   01   LD  (1357,2521)
 74   18   13   11   04   01   LD  (1358,2519)
 84   18   12   13   04   01   LD  (1364,2505)
 84   18   12   13   05   01   LD  (1365,2507)
 84   19   16   13   04   01   LD  (1366,2504)
 84   19   12   12   03   01   LD  (1366,2507)
 80   20   15   13   04   01   LD
511   19   14   21   10   01   WL
512   19   17   19   06   01   WL  PD  (SMALL POND IN MARSH)
513   20   17   23   08   01   WL  (VERY WET MARSH)
514   20   16   19   09   01   WL
515   18   16   24   11   01   WL
516   21   16   18   08   01   WL  (VERY WET MARSH)
517   19   17   21   07   01   WL  PD  (VERRRY SMALL POND IN MARSH)
518   21   17   22   10   01   WL
122   22   16   13   04   01   PD
```

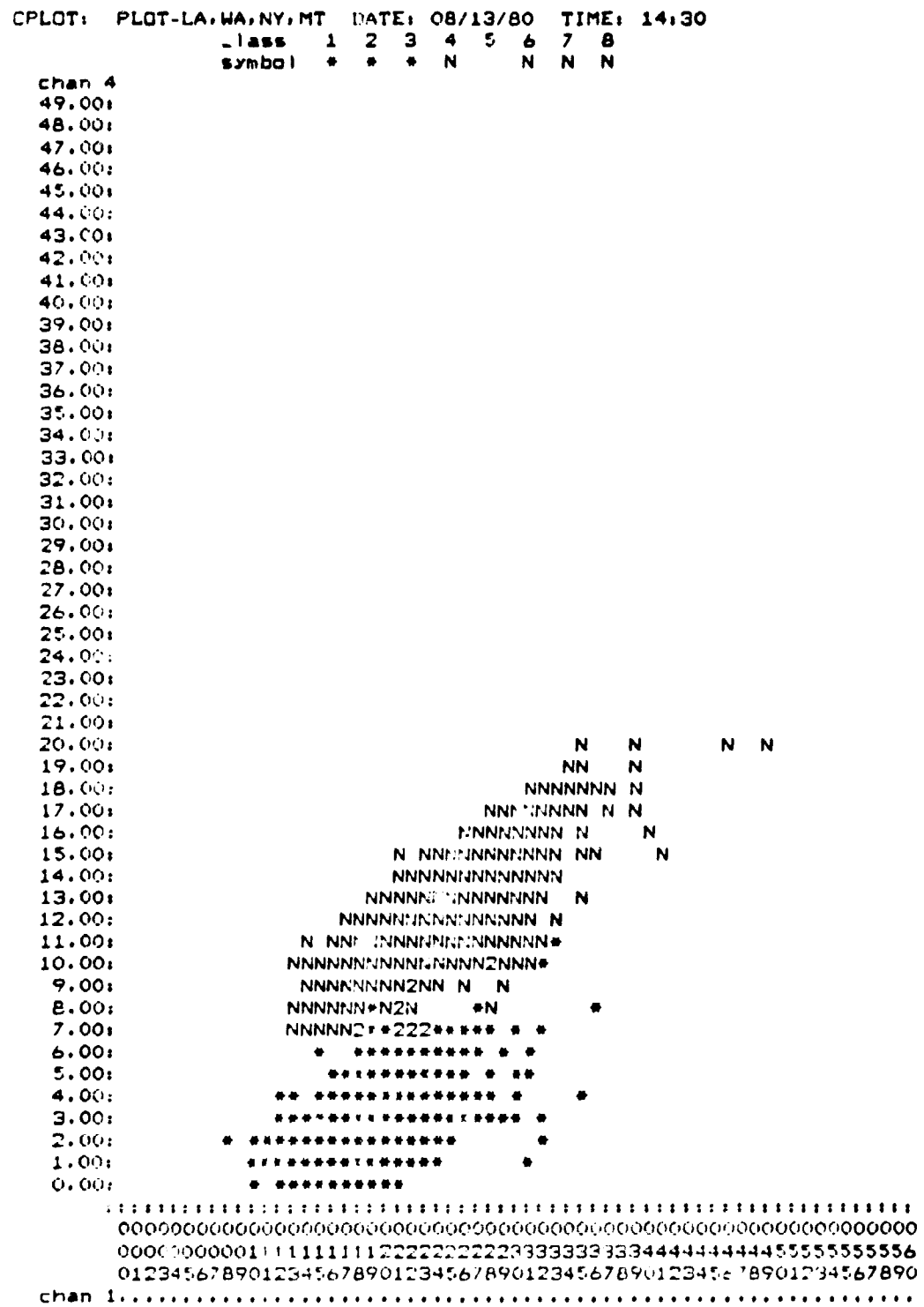
```
LIST1:
File:    PLOT-ALL.CMD        4   12-Aug-80


(PLOT-ALL)
X *CPLOT
    %+
    spa,1,1
    cha,%"(4 or 3)"%?,%"(1 or 2)"%?
    rad,0,49,0,60
    cla,1,RL,PL,LL
    cla,2,RM,PM,LM,TP
    cla,3,RD,PD,LD
    cla,4,BS,SD
    cla,5,SH
    cla,6,WL
    cla,7,CL
    cla,8,PA,BR,CO,IN,DT
    sym,-,1
    sym,+,2
    sym,*,3
    sym,B,4
    sym,S,5
    sym,W,6
    sym,C,7
    sym,U,8
    hea,CPLOT:  PLOT-LA,WA,NY,MT  DATE: %=  TIME: %=
    %"
      (CTRL-P to turn printer echo off, RETURN to continue)
      "%=
    fil,wh-la-9723
    fil,wh-la-9691
    fil,wh-la-9734
    fil,wh-la-9749
    fil,wh-wa-1440
    fil,wh-wa-1448
    fil,wh-wa-1468
    fil,wh-wa-1484
    fil,wh-wa-1490
    fil,wh-wa-1511
    fil,wh-wa-1513
    fil,wh-wa-1535
    fil,wh-wa-1582
    fil,wh-ny-059
    fil,wh-ny-062
    fil,wh-ny-070
    fil,wh-ny-076
    fil,wh-ny-085
    fil,wh-ny-091
```

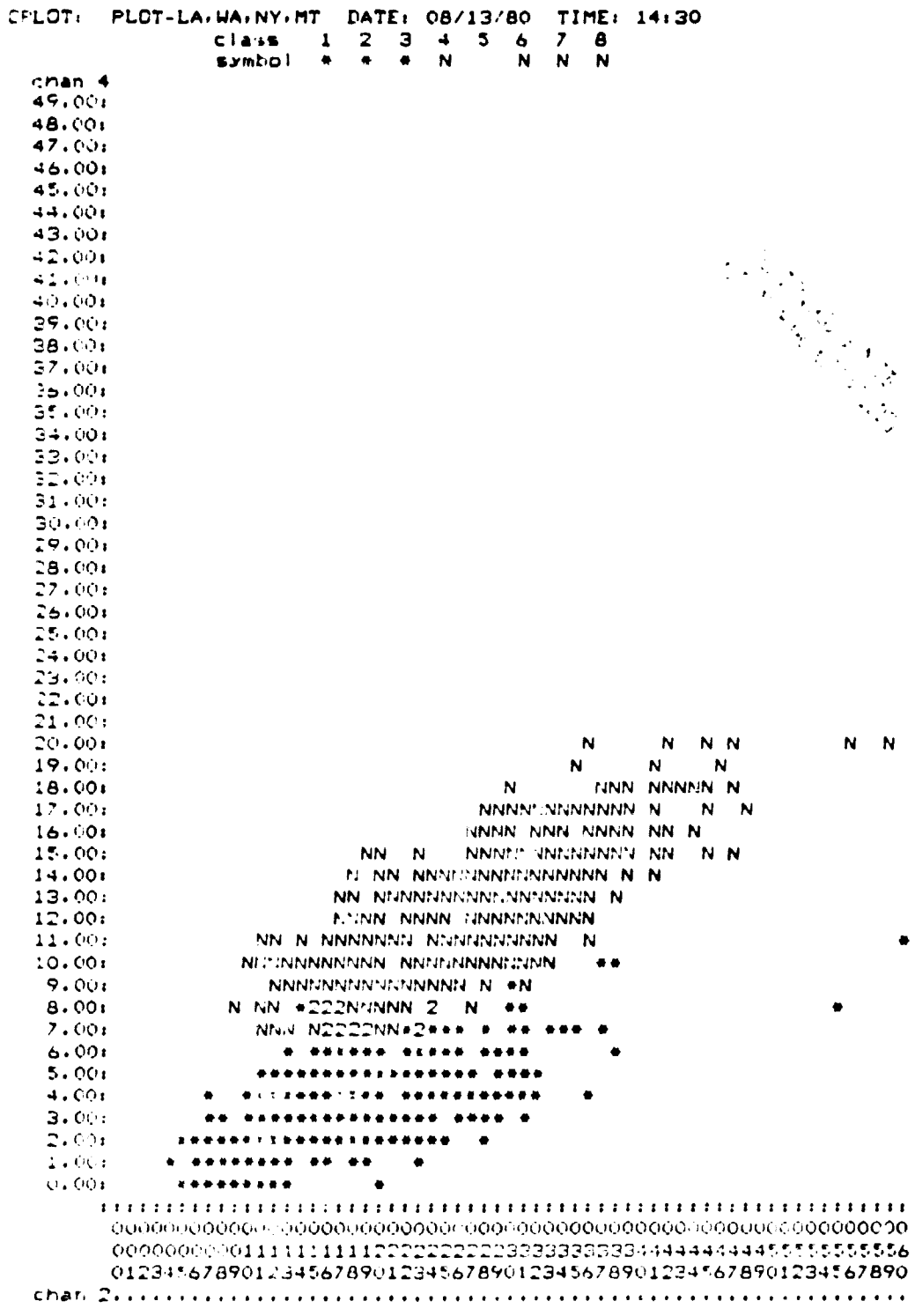
```
fil,wh-ny-094
fil,wh-ny-096
fil,bl-mt-9100
fil,bl-mt-9186
fil,bl-mt-9215
dis
sym,*,1,2,3
dis
sym, ,5
sym,N,4,6,7,8
dis
```

```
) spa,1,1
) cha,(4 or 3)4,(1 or 2)1
) rad,0,49,0,60
) cla,1,RL,PL,LL
) cla,2,RM,PM,LM,TP
) cla,3,RD,PD,LD
) cla,4,BS,SD
) cla,5,SH
) cla,6,WL
) cla,7,CL
) cla,8,PA,BR,CO,IN,DT
) sym,-,1
) sym,+,2
) sym,*,3
) sym,B,4
) sym,S,5
) sym,W,6
) sym,C,7
) sym,L,8
) hea,CPLOT:  PLOT-LA,WA,NY,MT  DATE: 08/13/80  TIME: 14:30
)
(CTRL-P to turn printer echo off, RETURN to continue)

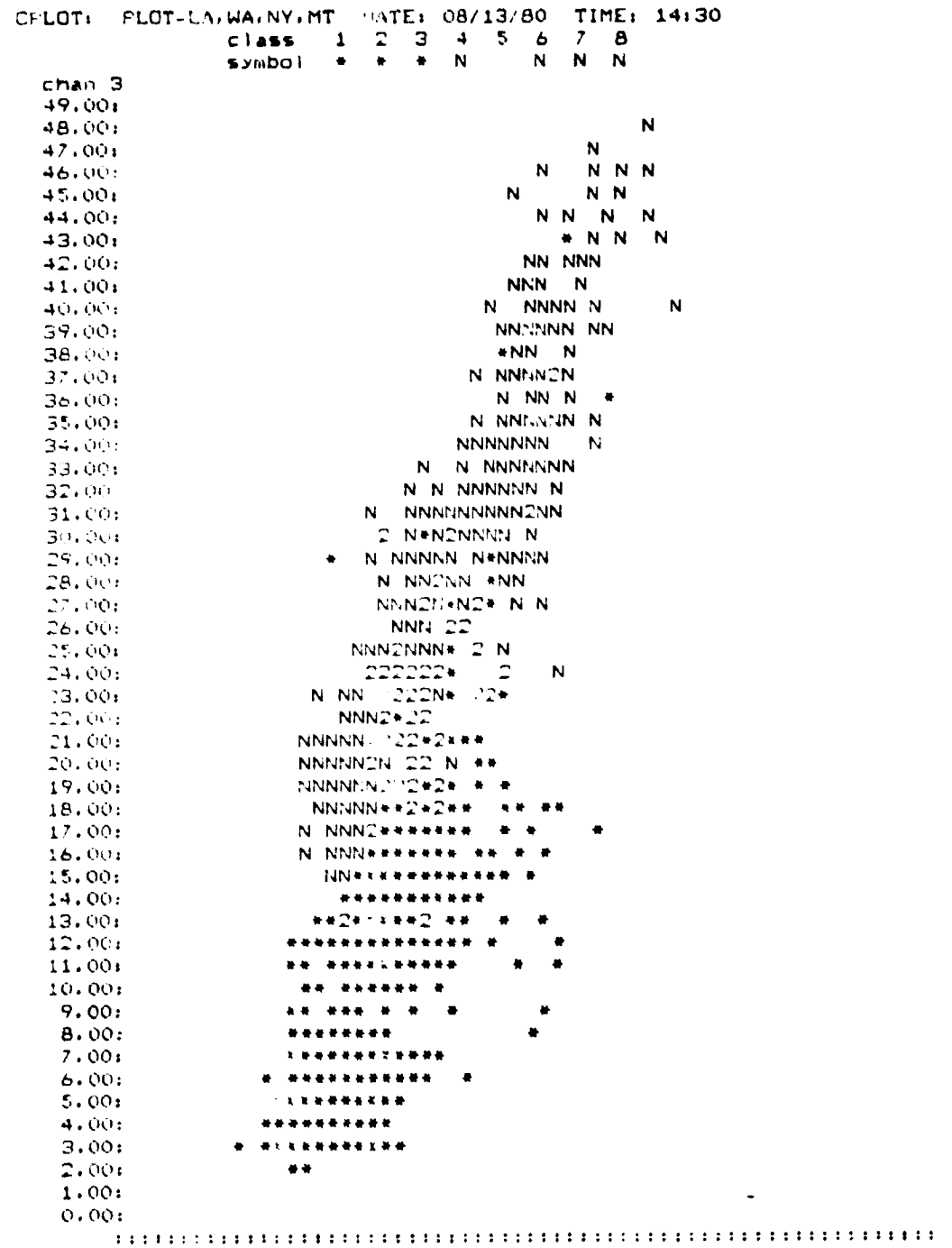
) fil,wh-la-9723
```


CPLOT: PLOT-LA,WA,NY,MT DATE: 08/13/80 TIME: 14:30
class 1 2 3 4 5 6 7 8
symbol * * * N N N N
chan 4
chan 1

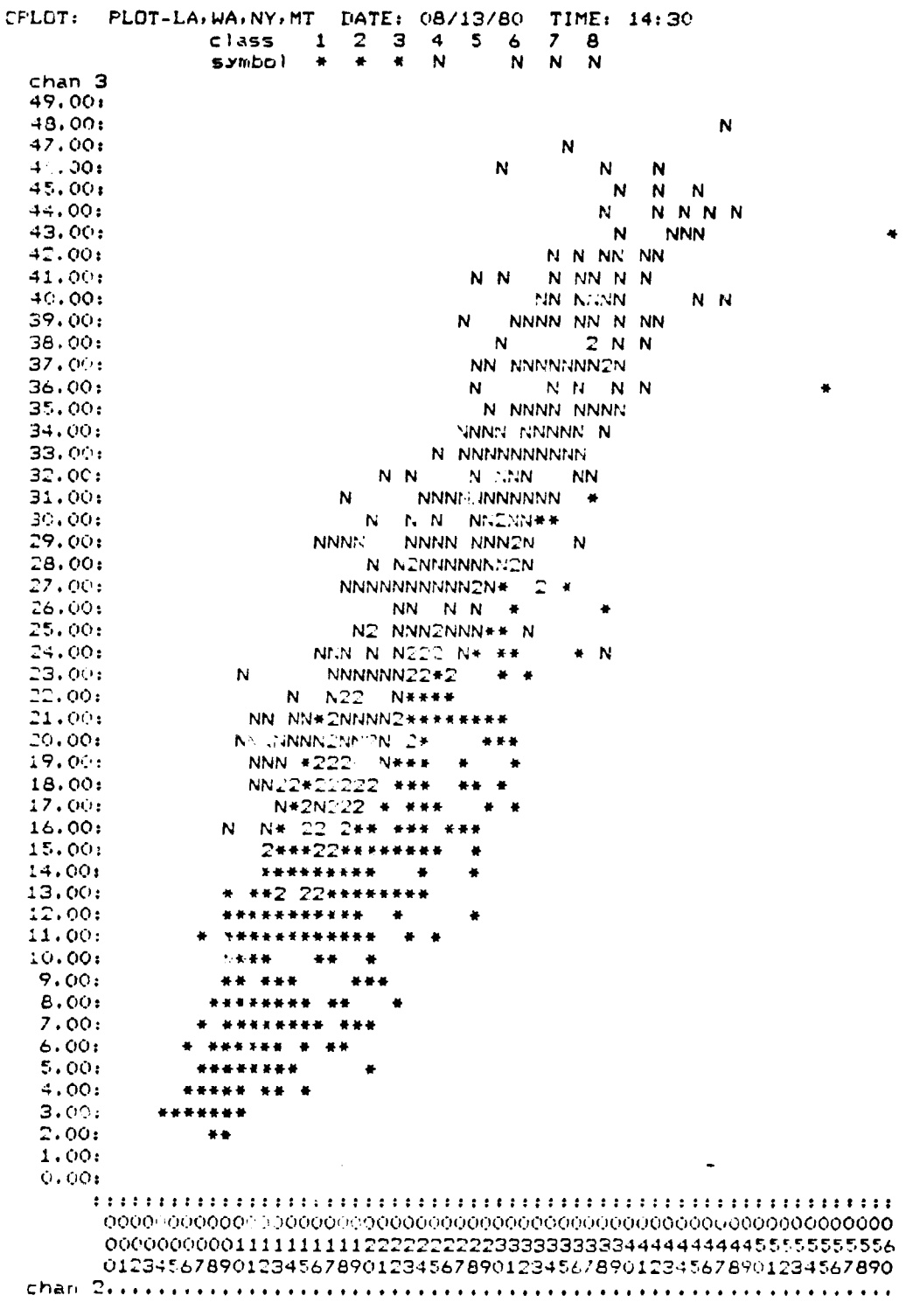
```
) spa,1,1
) cha,(4 or 3)4,(1 or 2)2
) rad,0,49,0,60
) cla,1,RL,PL,LL
) cla,2,RM,PM,LM,TP
) cla,3,RD,PD,LD
  cla,4,BS,SD
) cla,5,SH
) cla,6,WL
) cla,7,CL
) cla,8,PA,BR,CD,IN,DT
) sym,-,1
) sym,+,2
) sym,*,3
) sym,B,4
) sym,S,5
) sym,W,6
) sym,C,7
) sym,U,8
  hea,PLOT:  PLOT-LA,WA,NY,MT  DATE: 08/13/80  TIME: 14:30
)
(CTRL-P to turn printer echo off, RETURN to continue)
```


CPLOT: PLOT-LA,WA,NY,MT DATE: 08/13/80 TIME: 14:30
class 1 2 3 4 5 6 7 8
symbol * * * N N N N
chan 4
49.00:
48.00:
47.00:
46.00:
45.00:
44.00:
43.00:
42.00:
41.00:
40.00:
39.00:
38.00:
37.00:
36.00:
35.00:
34.00:
33.00:
32.00:
31.00:
30.00:
29.00:
28.00:
27.00:
26.00:
25.00:
24.00:
23.00:
22.00:
21.00:
20.00:
19.00:
18.00:
17.00:
16.00:
15.00:
14.00:
13.00:
12.00:
11.00:
10.00:
9.00:
8.00:
7.00:
6.00:
5.00:
4.00:
3.00:
2.00:
1.00:
0.00:
chan 2

```
) sea,1,1
) cha,(4 or 3)3,(1 or 2)1
) rad,0,49,0,60
) cla,1,RL,PL,LL
) cla,2,RM,PM,LM,TP
) cla,3,RD,PD,LD
) cla,4,BS,SD
) cla,5,SH
) cla,6,WL
) cla,7,CL
) cla,8,PA,BR,CO,IN,DT
) sym,-,1
) sym,+,2
) sym,*,3
) sym,B,4
) sym,S,5
) sym,W,6
) sym,C,7
) sym,U,8
) hea,CPLOT:  PLOT-LA,WA,NY,MT  DATE: 08/13/80  TIME: 14:30
)
(CTRL-P to turn printer echo off, RETURN to continue)
```

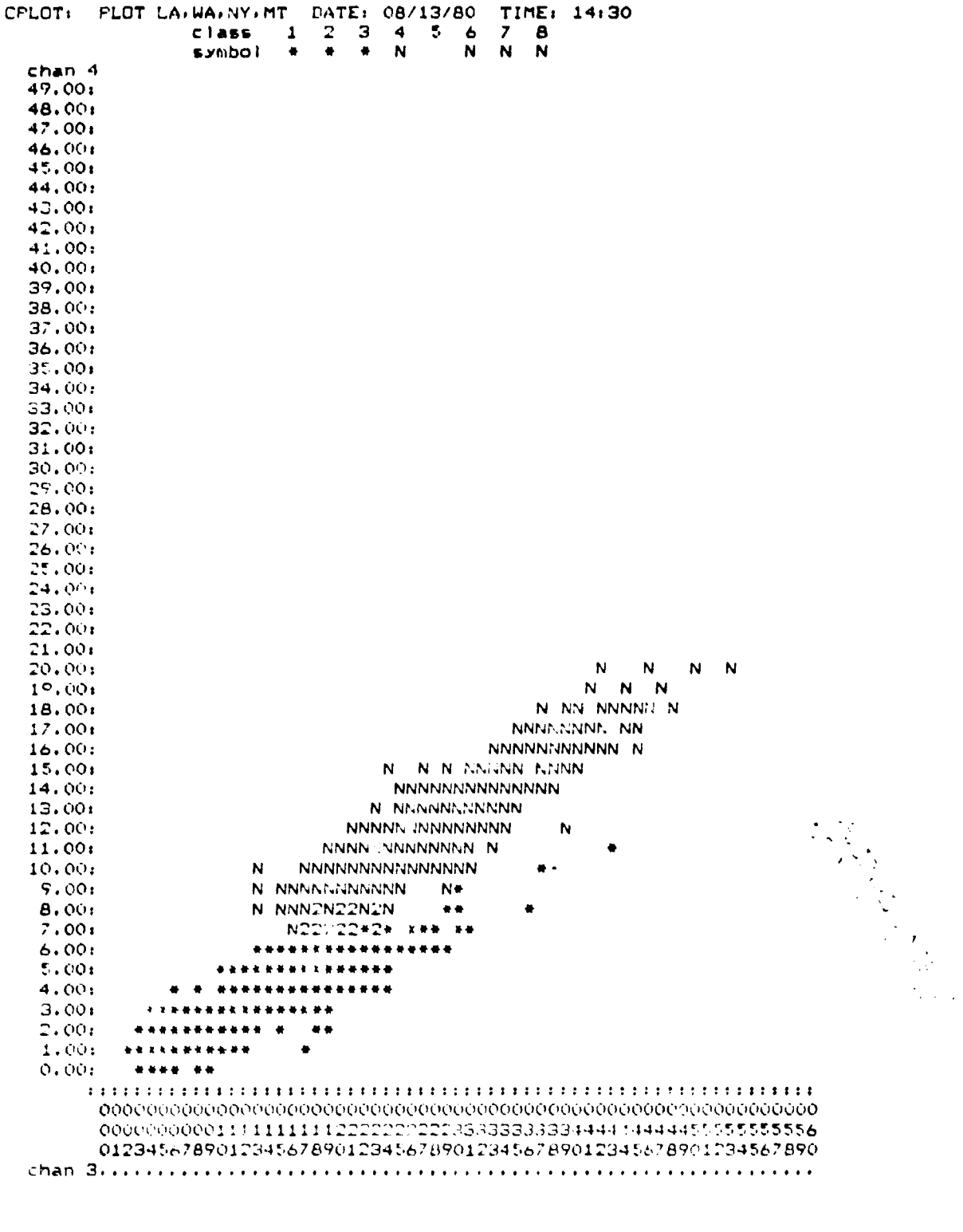

CPLOT: PLOT-LA,WA,NY,MT DATE: 08/13/80 TIME: 14:30
class 1 2 3 4 5 6 7 8
symbol * * * N N N N
chan 3
chan 1

```
) spa,1,1
' cha,(4 or 3)3,(1 or 2)2
) rad,0,49,0,60
' cla,1,RL,PL,LL
' cla,2,SM,PM,LM,TP
' cla,3,RD,PD,LD
' cla,4,ES,SD
) cla,5,SH
' cla,6,WL
) cla,7,CL
) cla,8,PA,BR,CO,IN,DT
) sym,-,1
) sym,+,2
' sym,*,3
' sym,B,4
' sym,S,5
) sym,D,6
' sym,C,7
) sym,U,8
' hea,CPLOT:  PLOT-LA,WA,NY,MT  DATE: 08/13/80  TIME: 14:30
)
(CTRL-P to turn printer echo off, RETURN to continue)
```


CPLOT: PLOT-LA,WA,NY,MT DATE: 08/13/80 TIME: 14:30
class 1 2 3 4 5 6 7 8
symbol * * * N N N N
chan 3
49.00:
48.00:
47.00:
46.00:
45.00:
44.00:
43.00:
42.00:
41.00:
40.00:
39.00:
38.00:
37.00:
36.00:
35.00:
34.00:
33.00:
32.00:
31.00:
30.00:
29.00:
28.00:
27.00:
26.00:
25.00:
24.00:
23.00:
22.00:
21.00:
20.00:
19.00:
18.00:
17.00:
16.00:
15.00:
14.00:
13.00:
12.00:
11.00:
10.00:
9.00:
8.00:
7.00:
6.00:
5.00:
4.00:
3.00:
2.00:
1.00:
0.00:
chan 2

```
spa,1,1
cha,(4 or 3)4,(1 or 2)3
rad,0,49,0,60
cla,1,RL,PL,LL
cla,2,RM,PM,LM,TP
cla,3,RD,PD,LD
cla,4,BS,SD
cla,5,SH
cla,6,WL
cla,7,CL
cla,8,PA,BR,CO,IN,DT
sym, ,1
sym,+,2
sym,*,3
sym,D,4
sym,S,5
sym,W,6
sym,C,7
sym,U,8
hea,DPLOT:  PLOT-1A,WA,NY,MT  DATE: 08/13/80  TIME: 14:30

(CTRL-P to turn printer echo off, RETURN to continue)
```


CPLOT: PLOT LA,WA,NY,MT DATE: 08/13/80 TIME: 14:30
class 1 2 3 4 5 6 7 8
symbol * * * N N N N
chan 4
49.00:
48.00:
47.00:
46.00:
45.00:
44.00:
43.00:
42.00:
41.00:
40.00:
39.00:
38.00:
37.00:
36.00:
35.00:
34.00:
33.00:
32.00:
31.00:
30.00:
29.00:
28.00:
27.00:
26.00:
25.00:
24.00:
23.00:
22.00:
21.00:
20.00:
19.00:
18.00:
17.00:
16.00:
15.00:
14.00:
13.00:
12.00:
11.00:
10.00:
9.00:
8.00:
7.00:
6.00:
5.00:
4.00:
3.00:
2.00:
1.00:
0.00:
chan 3

APPENDIX D
LINEAR DISCRIMINANT SOFTWARE

LINDISC.TEXT D-2

KOMLDIS.TEXT D-4

INITLDIS.TEXT D-5

KMDCLA.TEXT D-7

KMDFIL.TEXT D-10

KMDFIT.TEXT D-14

KMDHEA.TEXT D-16

KMDTAB.TEXT D-17

CLA4LAB.TEXT D-19

GETINT.TEXT D-21

GETOKEN.TEXT D-24

LINTAB.TEXT D-27

MATINV.TEXT D-29

MATPRT.TEXT D-31

RDLINPUT.TEXT D-32

READICVL.TEXT D-33

UPCHAR.TEXT D-35

VECPRT.TEXT D-36

WCOVAR.TEXT D-37

WEIGH.TEXT D-39

WLDIS.TEXT D-41

WMEAN.TEXT D-44

WRCLALAB.TEXT D-46

```
WLDIS:
File:   LINDISC.TEXT       6  11-Aug-80


(*$S+*) {compile in swapping mode to increase compiler stack size}

PROGRAM LINDISC;  {LINear DISCriminant}


  {HISTORY}
    {E H Schlosser      LEMSCO  28-Jul-80       Original code}
    {E H Schlosser      LEMSCO  05-Aug-80       Weighting}
    {E H Schlosser      LEMSCO  11-Aug-80       Tabulate command}

  {METHOD}
    {Get command and call appropriate command procedures.}

  {EXCEPTIONS}
    {Invalid command generates diagnostic.}

  VAR
    Komd       : string[6];

  {GLOBAL DECLARATIONS}
    (*$I KOMLDIS*)

  {EXTERNAL REFERENCES}
    (*$I INITLDIS*)
    (*$I UPCHAR*)
    (*$I GETOKEN*)
    (*$I GETINT*)
    (*$I RDLINPUT*)
    (*$I VECPRT*)
    (*$I MATPRT*)
    (*$I WRCLALAB*)
    (*$I READICVL*)
    (*$I CLA4LAB*)
    (*$I WEIGH*)
```

```
  (*$I WMEAN*)
  (*$I WCOVAR*)
  (*$I MATINV*)
  (*$I WLDIS*)
  (*$I LINTAB*)
  (*$I KMDHEA*)
  (*$I KMDCLA*)
  (*$I KMDFIL*)
  (*$I KMDFIT*)
  (*$I KMDTAB*)

BEGIN
  INITLDIS;
  writeln('LINDISC');
  writeln('user input:');
  write('>');
  komd := ' ';
  GETOKEN(komd,   3,',',INPUT);
  WHILE komd<>'EXI' DO
    BEGIN
      IF komd='CLA' THEN
        KMDCLA(komd)            {Class}
      ELSE IF komd='FIL' THEN
        KMDFIL(komd)            {File}
      ELSE IF komd='FIT' THEN
        KMDFIT(komd)            {Fit}
      ELSE IF komd='HEA' THEN
        KMDHEA(komd)            {Heading}
      ELSE IF komd='TAB' THEN
        KMDTAB(komd)            {Tabulate}
      ELSE IF komd<>' ' THEN
        writeln('INVALID COMMAND -- ',komd);
      RDLINPUT;
      GETOKEN(komd,   3,',',INPUT);
    END;
END.
```

```
WLDIS:
File:    KOMLDIS.TEXT       4  11-Aug-80

  (MACRO KOMLDIS)

  TYPE

    pchar2    = PACKED ARRAY[1..2] OF char;
    pchar4    = PACKED ARRAY[1..4] OF char;
    string40  = string[40];
    vec5      = ARRAY[1..5] OF real;
    ivec5     = ARRAY[1..5] OF integer;
    ivec100   = ARRAY[1..100] OF integer;
    vec1500   = ARRAY[1..1000] OF real;
    mat4x4    = ARRAY[1..4,1..4] OF real;
    i1500x4   = ARRAY[1..1000,1..4] OF integer;

  VAR

    eject     : pchar4; (page eject -- must initialize to CR (13) & VT (11) )
    komcha    : ARRAY[1..4] OF integer;
    komhea    : string[72];
    komlabel  : ARRAY[1..10] OF
                ARRAY[1..8] OF pchar2;
    data1     : i1500x4; (data for class 1)
    data2     : i1500x4; (data for class 2)
    nobmax1   : integer; (number of observations in class 1 (max 1500))
    nobmax2   : integer; (number of observations in class 2 (max 1500))
    nvarmax   : integer; (number of variables (max 4))
    coefdisc  : vec5; (coefficients of discriminant function --
                       nvarmax gains + 1 bias)
    threshold : real;
```

```
WLDIS:
File:   INITLDIS.TEXT      4  11-Aug-80

  PROCEDURE INITLDIS;  (INITialize variables for Linear DIScriminant program)

    (HISTORY)
      (E H Schlosser    LEMSCO  29-Jul-80       Original code)

    (METHOD)
      (Initialize.)

    (EXCEPTIONS)
      (None.)

    VAR
      nrow,ncol : integer;

    (GLOBAL REFERENCES)
      (KOMLDIS)

    BEGIN

      eject[1] := chr(13); (CR)
      eject[2] := chr(00); (NUL)
      eject[3] := chr(11); (VT)
      eject[4] := chr(00); (NUL)

      Komhea := ' ';

      FOR nrow := 1 TO 10 DO
        FOR ncol := 1 TO 8 DO
          Komlabel[nrow,ncol] := '   ';

      nobmax1 := 0;
      nobmax2 := 0;
      nvarmax := 4;
```

```
  FOR nrow := 1 TO 5 DO
    coefdisc[nrow] := 0.0;

END;
```

```
WLDIS:
File:   KMDCLA.TEXT          8  29-Jul-80


  PROCEDURE KMDCLA(  (KoMmanD to set CLAss number & labels for it)
    VAR(out/in) Komand : string); ('CLA' input, ' ' output)


    (HISTORY)
      (Mary Ann Tompkins          LEMSCO  16-Apr-80       Original code)
      (E H Schlosser              LEMSCO  29-Jul-80       Rewrite)

    (METHOD)
      (Check class.  CHECK IF LABEL duplicated.  Post label to Komlabel.)

    (EXCEPTIONS)
      (If CLASS (1 OR )8, complain & RETURN)
      (If length of label not 2 characters, complain & RETURN)
      (If label duplicated, complain.)

    VAR
      labelstr : string[4]; (tentative label)
      labchars : pchar2; (two-char label)
      classnum : integer; (DIGIT 1-8, Komlabel column index)
      classdup : integer; (possible duplicate class number for current label)
      labelrow : integer; (DIGIT 1-10, Komlabel row index)
      labelnum : integer; (label number)
      classok  : boolean; (OK--CONTINUED PROGRAM FLOW)
      cleared  : boolean; (old labels for current class have been cleared)

    (GLOBAL DECLARATIONS)
      (KOMLDIS)

    (EXTERNAL REFERENCES)
      (GETINT)
      (GETOKEN)
      (CLA4LAB)
```

```
BEGIN
  komand := ' '; {one blank means command called}
  classnum := maxint;
  classok := true;
  cleared := false;

  GETINT(classnum,   ',',INPUT);
  IF (classnum(1) OR (classnum)8) THEN
    BEGIN
      classok := false;
      IF classnum = maxint THEN
        writeln ('NO CLASS')
      ELSE
        writeln('BAD CLASS -- ',classnum);
    END;

  IF classok THEN
    FOR labelnum := 1 TO 10 DO
      BEGIN
        labelstr := ' nul';
        GETOKEN(labelstr,  4,',',INPUT);
        IF labelstr=' nul' THEN
          BEGIN
            IF labelnum=1 THEN WRCLALAB;
          END
        ELSE IF length(labelstr)()2 THEN
          writeln('BAD LABEL -- ',labelstr)
        ELSE
          BEGIN
            labchars[1] := labelstr[1];
            labchars[2] := labelstr[2];
            IF NOT cleared THEN
              BEGIN
                cleared := true;
                FOR labelrow := 1 TO 10 DO
                  komlabel[labelrow,classnum] := '  ';
                labelrow := 0;
              END;
            classdup := CLA4LAB(labchars);
            IF classdup()0 THEN writeln
```

```
                ('LABEL ',labelstr,' ALREADY ASSIGNED TO CLASS ',classdup)
              ELSE
                BEGIN
                  labelrow := labelrow+1;
                  KomLabel[labelrow,classnum] := labchars;
                END;
            END;
        END;
END;
```

```
WLDIS:
File:   KMDFIL.TEXT        10   1-Aug-80

  PROCEDURE KMDFIL(  {KoMmanD to set data from specified FILe}
    VAR{out/in} Komand : string); {'FIL' input, ' ' output}


    {HISTORY}
      {Mary Ann Tompkins          LEMSCO  25-Apr-80       Original code}
      {E H Schlosser              LEMSCO  29-Jul-80       Rewrite}

    {METHOD}
      {Read file name.  Read 'list', if specified.  Check length of file name.
      Prefix volume number (#5:) & append '.TEXT' to file name and attempt
      to open file.  If successful, set point numbers, channel values, labels,
      and comments from file records, possibly list them on CRT, convert
      labels to class numbers, and store channel values in data arrays for
      appropriate classes.}

    {EXCEPTIONS}
      {1. If file name is missing or length of file name > 10, complain and
          return.}
      {2. If there is an iostatus error on opening file, complain and return.}

    VAR
      ok         : boolean;
      diskfid    : interactive;
      diskname   : string[20];
      iostatus   : integer; {ioresult on open}
      listing    : boolean; {true if writing to CRT}
      checking   : boolean; {true if checking discriminant}
      pointnum   : integer;
      nchan      : integer; {index for 4 channel values}
      chanval    : ivec5; {integer channel values}
      pixcount   : integer; {pixel count}
      labchars   : pchar2; {label}
      comment    : string; {optional inline comment}
```

```
  class      : integer;
  discfun    : real; {value of discriminant function}

{GLOBAL DECLARATIONS}
  {KOMLDIS}

{EXTERNAL REFERENCES}
  {GETOKEN}
  {WRCLALAB}
  {READICVL}
  {CLA4LAB}

BEGIN

  komand := ' '; {one blank means command called}
  diskname := ' ';
  GETOKEN(diskname,  13,',',INPUT);
  comment := 'no list';
  GETOKEN(comment,   3,',',INPUT);
  listing := ((comment='LIS'{t}) OR (comment='CHE'{ck}));
  checking := (comment='CHE'{k});

  ok := false;
  IF diskname=' ' THEN
    writeln('no file name')
  ELSE IF length(diskname)>10 THEN
    writeln('file name ',diskname,' too long')
  ELSE ok := true;

  IF ok THEN
    BEGIN {attempt to open disk file on unit #5}
      INSERT('#5:',diskname,1);
      INSERT(',TEXT',diskname,(length(diskname)+1));
      {$I-} {operating system won't check I/O status}
        RESET(diskfid,diskname);
        iostatus := IORESULT;
      {$I+} {operating system resumes checking I/O status}
      ok := (iostatus = 0);
      IF NOT ok THEN
        BEGIN
```

```
        writeln('ERROR ',icstatus,' OPENING ',diskname);
      END;
  END;

IF ok THEN
  BEGIN

    {write headings}
    IF listing THEN writeln(eject,'LINDISC:  ',komhea);
    WRCLALAB;
    writeln;
    IF checking THEN
      VECPRT('coefficients',coefdisc,nvarmax+1);
    IF listing THEN
      BEGIN
        writeln;
        writeln(diskname,' CHANNEL VALUES');
        write  ('PT#  CH1 CH2 CH3 CH4  #PX LAB CL');
        IF checking THEN write(' DISCR');
        writeln;
      END;

    WHILE NOT eof(diskfid) DO
      BEGIN {read fields from disk records, save in arrays, write to CRT}
        READICVL(pointnum,chanval,pixcount,labchars,comment,   diskfid);
        IF NOT eof(diskfid) THEN
          BEGIN

            class := CLA4LAB(labchars);
            IF NOT checking THEN
              BEGIN {store channel values in data arrays}
                IF class=1 THEN
                  BEGIN
                    nobmax1 := nobmax1+1;
                    FOR nchan := 1 TO 4 DO
                      data1[nobmax1,nchan] := chanval[nchan];
                  END
                ELSE IF class=2 THEN
                  BEGIN
                    nobmax2 := nobmax2+1;
```

```
                    FOR nchan := 1 TO 4 DO
                      data2[nobmax2,nchan] := chanval[nchan];
                  END;
              END;

            IF listing THEN
              BEGIN (write info to CRT)
                write(pointnum:3,'  ');
                FOR nchan := 1 TO 4 DO
                  write(chanval[nchan]:3,' ');
                write(' ',pixcount:3,'  ',labchars,'  ',class:1,' ');
                IF checking THEN
                  BEGIN
                    discfun := coefdisc[nvarmax+1];
                    FOR nchan := 1 TO nvarmax DO
                      discfun := discfun+coefdisc[nchan]*chanval[nchan];
                    write(discfun:5:1,' ');
                    IF class=1 THEN
                      BEGIN
                        IF discfun(0 THEN
                          write('*ERR* ');
                      END
                    ELSE IF class=2 THEN
                      BEGIN
                        IF discfun)0 THEN
                          write('*ERR* ');
                      END;
                  END;
                writeln(comment);
              END;

          END;
      END;

    CLOSE(diskfid);
    writeln;

  END;
END;
```

```
WLDIS:
File:   KMDFIT.TEXT        6  11-Aug-80


  PROCEDURE KMDFIT(  {KoMmanD to FIT linear discriminant}
    VAR{out/in} komand : string); {'FIT' input, ' ' output}


    {HISTORY}
      {E H Schlosser     LEMSCO  28-Jul-80       Original code}
      {E H Schlosser     LEMSCO  05-Aug-80       Weighting}
      {E H Schlosser     LEMSCO  11-Aug-80       Real threshold}

    {METHOD}
      {Gaussian fit.}

    {EXCEPTIONS}
      {None.}

    {GLOBAL DECLARATIONS}
      {KOMLDIS}

    {EXTERNAL REFERENCES}
      {BLDIS}
      {VECPRT}

    BEGIN
      threshold := 100000.0;
      IF NOT eoln THEN
        read(threshold);
      writeln(eject,'LINDISC:  ',komhea);
      writeln;

      writeln('discriminant threshold: ',threshold:10:2);
      writeln;
      VECPRT('initial coefficients of linear discriminant function',
        coefdisc,nvarmax+1);
      writeln;
```

```
    writeln(nobmax1:4,' observations in class 1');
    writeln(nobmax2:4,' observations in class 2');

    WLL.S(coefdisc,  data1,data2,nobmax1,nobmax2,nvarmax,coefdisc,threshold);

    writeln;
    writeln('final coefficients of linear discriminant function');
    write  ('(',nvarmax:1,' gains + 1 bias)');
    VECPRT(' ',coefdisc,nvarmax+1);
    writeln;
    writeln('  (class 1 ) 0.0)');
    writeln('  (class 2 ( 0.0)');
    writeln;
    writeln;

END;
```

```
WLDIS:
File:    KMDHEA.TEXT        4  29-Jul-80

  PROCEDURE KMDHEA(  {KoMmanD to get HEAding}
    VAR{out/in} Komand : string); {'HEA' input, ' ' output}


    {HISTORY}
      {J C Crisp          LEMSCO  25-Jul-80       Original code}
      {E H Schlosser      LEMSCO  29-Jul-80       Getoken & string heading}

    {METHOD}
      {Read heading text from input file and store as string.}

    {GLOBAL DECLARATIONS}
      {KOMLDIS}

    {EXTERNAL REFERENCES}
      {GETOKEN}

    BEGIN
      komand := ' '; {one blank means command called}
      GETOKEN(komhea,   72,'!',INPUT);
    END;
```

```
WLDIS:
File:   KMDTAB.TEXT        6  11-Aug-80

  PROCEDURE KMDTAB(  {KoMmanD to TABulate observations by linear discriminant}
    VAR{out/in} komand : string); {'TAB' input, ' ' output}


    {HISTORY}
      {E H Schlosser    LEMSCO  11-Aug-80       Original code}

    {METHOD}
      {Accumulate count and print it.}

    {EXCEPTIONS}
      {None.}

    VAR
      increment : real;
      increminv : real;
      discbin   : integer;
      tab1      : ivec100;
      tab2      : ivec100;
      binmin    : integer;
      binmax    : integer;

    {GLOBAL DECLARATIONS}
      {KOMLDIS}

    {EXTERNAL REFERENCES}
      {VECPRT}
      {LINTAB}

    BEGIN

      {get optional increment specification}
      komand := ' '; {one blank means command called}
      increment := 0.1;
```

```
  IF NOT eoln THEN
    read(increment);
  increment := ABS(increment);
  IF increment<0.05 THEN increment := 0.05;
  IF increment>5.00 THEN increment := 5.00;
  increminv := 1.0/increment;

  {write pa<    eading}
  writeln(e     ,'LINDISC:  ',Komhea);
  VECPRT('c     icients of linear discriminant function',
    coefdis   varmax+1);
  writeln;

  {tabulate linear discriminant separately for each class}
  LINTAB(tab1,   data1,nobmax1,nvarmax,coefdisc,increminv);
  LINTAB(tab2,   data2,nobmax2,nvarmax,coefdisc,increminv);

  {find limits of tabulated data}
  binmin := 99;
  binmax := 1;
  FOR discbin := 1 TO 99 DO
    IF (tab1[discbin]<>0) OR
       (tab2[discbin]<>0) THEN
         BEGIN
           IF binmin>discbin THEN binmin := discbin;
           IF binmax<discbin THEN binmax := discbin;
         END;

  {print tabulations}
  writeln('DISCRIM  Class1 Class2');
  FOR discbin := binmin TO binmax DO
    writeln((discbin-50)*increment:7:2,' ',tab1[discbin]:7,tab2[discbin]:7);
  writeln;
  writeln('TOTAL    ',nobmax1:7,nobmax2:7);

  writeln;
  writeln;

END;
```

```
WLDIS:
File:   CLA4LAB.TEXT        4  29-Jul-80


  FUNCTION CLA4LAB(  (CLAss for LABel)
    (in) labchars : pchar2) : integer; (out)


    (HISTORY)
      (Mary Ann Tompkins          LEMSCO  04/25/80        Original code)
      (E H Schlosser              LEMSCO  29-Jul-80       Rewrite)

    (METHOD)
      (Initialize class to 0.  Search non-blank areas of komlabel for label.
      If found, assign class and terminate search.)

    (EXCEPTIONS)
      (None)

    VAR
      labcol,labrow : integer; (komlabel[labrow,labcol])
      class : integer;

    BEGIN
      class := 0;
      labcol := 1;
      WHILE (class=0) AND (labcol<=8) DO
        BEGIN
          labrow := 1;
          WHILE (class=0) AND (labrow<=10) DO
            BEGIN
              IF komlabel[labrow,labcol]='  ' THEN
                labrow := 10
              ELSE IF komlabel[labrow,labcol]=labchars THEN
                class := labcol;
              labrow := labrow + 1;
            END;
          labcol := labcol + 1;
```

```
    END;
  CLA4LAB := class;
END;
```

```
WLDIS:
File:   GETINT.TEXT        6  29-Jul-80


  PROCEDURE GETINT(  (GET INTeger token from specified open file)
    VAR(out) intoken : integer;
    (=)
       (in)  delim   : char; (delimiter character after token)
    VAR(in)  fileid  : interactive); (one of the following:
                                        INPUT    -- system terminal with echo
                                        KEYBOARD -- system terminal w/o echo
                                        (other)  -- open disk file)


    (HISTORY)
      (Mary Ann Tompkins  LEMSCO  03-Apr-80       Original code)
      (E H Schlosser      LEMSCO  29-Jul-80       New delim & fileid args)

    (METHOD)
      (Build integer from character string token returned by GETOKEN)

    (EXCEPTIONS)
      (IF TOKEN(I) () DIGIT ISSUE NOTE)
      (ALLOWABLE TOKEN COUNT IS 5 CHARACTERS)
      (If there are no characters left in the current line when GETINT is
      called THEN intoken is unchanged.)
      (Signed integers NOT supported.)

    VAR
      token : string[10]; (character string token)
      digit : integer; (d  t 0-9)
      I : integer; (digit counter)
      count : integer; (POSITION POINTER TO token string)
      CR : char; (CARRAGE RETURN)
      intemp : integer; (TEMP. STORAGE FOR OUTPUT)
      FALSETKN : boolean; (FALSE-- CHANGE)

    (EXTERNAL REFERENCES)
```

```
  (GETOKEN)  (GET string TOKEN from file)

BEGIN
  token := ' NUL';
  GETOKEN(token,   10,delim,fileid);
  IF token () ' NUL' THEN
    BEGIN
     count := 1;
     CR := CHR(13);
     intemp := 0;
     FALSETKN := FALSE;

     IF LENGTH(token) (= 5
       THEN
         BEGIN
           FOR I := 1 TO LENGTH(token) DO
             BEGIN
               digit := ORD(token[count]) - ORD('0');
               IF (digit ) 9) OR (digit ( 0)
                 THEN
                   BEGIN
                     IF NOT FALSETKN
                       THEN
                         BEGIN
                           WRITELN(token,' ILLEGAL INTEGER VARIABLE',CR);
                           FALSETKN := TRUE;
                         END;
                   END
                 ELSE
                   BEGIN
                     intemp := intemp*10 + digit;
                     count := count + 1;
                   END;
             END;
       END
      ELSE
        WRITELN('MAXIMUM NUMBER OF DIGITS EXCEEDED',CR);
        IF NOT FALSETKN
          THEN INTOKEN := intemp;
```

```
END;
END;
```

```
WLDIS:
File:   GETOKEN.TEXT        8  29-Jul-80


  PROCEDURE GETOKEN(  {GET string TOKEN from specified open file}
    VAR{out} token   : string; {character string token}
    {=}
       {in}  lentok  : integer; {truncate token to this length if longer}
       {in}  delim   : char; {delimiter character after token}
    VAR{in}  fileid  : interactive); {one of the following:
                                        INPUT    -- system terminal with echo
                                        KEYBOARD -- system terminal w/o echo
                                        {other}  -- open disk file}


    {HISTORY}
      {Mary Ann Tompkins  LEMSCO  27-Mar-80       Original code}
      {E H Schlosser      LEMSCO  29-Jul-80       New delim & fileid args}

    {METHOD}
      {THIS PROCEDURE GETS ALL FREE-FORMAT DATA FIELDS.}

       {FREE-FORMAT INPUT RULES}
          {1. LINES -- AN INPUT LINE CONTAINS UP TO 80 CHARACTERS
              TERMINATED BY A CARRIAGE RETURN.}
          {2. DELIMITER -- ENDS DATA FIELD (NEXT DATA FIELD FOLLOWS)}
          {3. FIELDS -- EACH DATA FIELD IS COMPOSED OF A SIGNFICANT AND
              A NON-SIGNIFICANT PART. THE SIGNIFICANT PART IS DETERMINED
              BY A SPECIFIED MAXIMUM length.  ALL leading and trailing
              BLANKS AND NON-SIGNIFICANT PARTS ARE IGNORED, unless the
              field is composed entirely of blanks, in which case a
              single blank is returned in token.}

    {EXCEPTIONS}
      {If there are no characters left in the current line when GETOKEN is
      called THEN token is unchanged.}
      {Backspace key (ASCII CTRL-H) works properly.}
```

```
VAR
  character : char; {1 character}
  locend    : integer; {location in token of current last char}
  newend    : integer; {new location of last char}
  string1   : string[1]; {string of 1 character}
  backspace : char;

{EXTERNAL REFERENCES}
  {UPCHAR}  {convert lowercase letters to UPpercase CHARacters}

BEGIN
  IF NOT eoln(fileid) THEN
    BEGIN
      backspace := chr(8); {ASCII BS}
      token := ''; {initialize to null string}
      locend := 0;
      string1 := '?'; {so it has a logical length of one}

      {Get first non-blank character}
      character := ' ';
      WHILE (character=' ') AND (NOT eoln(fileid)) DO
        read(fileid,character);

      {Get & append characters until delimiter or end of line}
      WHILE (character()delim) AND (NOT eoln(fileid)) DO
        BEGIN
          IF character=backspace THEN
            BEGIN {delete previous character}
              IF locend)0 THEN
                BEGIN
                  DELETE(token,locend,1);
                  locend := locend-1;
                END;
            END
          ELSE IF locend(lentok THEN
            BEGIN {append character to token}
              string1[1] := UPCHAR(character);
              locend := locend+1;
              INSERT(string1,token,locend);
            END;
```

```
            read(fileid,character);
          END;

          IF locend=0
            THEN token := ' ' {pad null token with one blank}
          ELSE
            BEGIN {remove trailing blanks from tokens longer than 1}
              newend := locend;
              WHILE (newend>1) AND (token[newend]=' ') DO
                newend := newend-1;
              IF newend<>locend THEN
                DELETE(token,newend+1,locend-newend);
            END;

      END;
END;
```

```
WLDIS:
File:   LINTAB.TEXT          6  11-Aug-80


  PROCEDURE LINTAB(  {TABulate LINear discriminant for data observations}
    VAR{out} tab       : ivec100; {integer tabulation vector}
    {=}
    VAR{in}  data      : i1500x4; {integer matrix of 1500 observ X 4 variables}
       {in}  nobmax    : integer; {number of observations (rows) filled in data}
       {in}  nvarmax   : integer; {number of variables (columns) filled in data}
       {in}  coefs     : vec5; {coefficients of linear discriminant}
       {in}  increminv: real); {inverse of tabulation increment}

    {HISTORY}
      {E H Schlosser    LEMSCO  11-Aug-80       Original code}

    {METHOD}
      {Clear tab, then accumulate in tab.}

    {EXCEPTIONS}
      {None.}

    VAR
      nob,nrow : integer;
      discfun  : real;
      discbin  : integer;

    BEGIN

      FOR discbin := 1 TO 99 DO
        tab[discbin] := 0;


      FOR nob := 1 TO nobmax DO
        BEGIN
          discfun := coefs[nvarmax+1];
          FOR nrow := 1 TO nvarmax DO
            discfun := discfun + coefs[nrow]*data[nob,nrow];
```

```
        discbin := round(discfun*increminv)+50;
        IF discbin<1 THEN discbin := 1
        ELSE IF discbin>99 THEN discbin := 99;
        tab[discbin] := tab[discbin]+1;
      END;

END;
```

```
WLDIB:
File:   MATINV.TEXT        6  29-Jul-80


  PROCEDURE MATINV(  {MATrix INVert}
    VAR{out} determ  : real; {determinant}
    VAR{out} inverse : mat4x4; {inverse of order nrcmax in 4 by 4 matrix}
    {=}
    VAR{in}  matinp  : mat4x4; {square matrix of order nrcmax in 4 by 4 matrix}
       {in}  nrcmax  : integer); {number of rows & columns filled in matinp}


    {HISTORY}
      {E H Schlosser    LEMSCO  28-Jul-80       Original code}

    {METHOD}
      {Copy matinp to inverse.  Gauss reduction without row and column
      interchanges.}

    {EXCEPTIONS}
      {None.}

    VAR
      nrpvt,nrow,ncol : integer;
      pivot,temp : real;

    BEGIN

      {Initialize determinant & inverse}
      determ := 1.0;
      FOR nrow := 1 TO nrcmax DO
        FOR ncol := 1 TO nrcmax DO
          inverse[nrow,ncol] := matinp[nrow,ncol];

      FOR nrpvt := 1 TO nrcmax DO
        BEGIN

          {set pivot element & update determinant}
```

```
        pivot := inverse[nrpvt,nrpvt];
        inverse[nrpvt,nrpvt] := 1.0;
        determ := determ*pivot;

        FOR ncol := 1 TO nrcmax DO {divide pivot row by pivot element}
          inverse[nrpvt,ncol] := inverse[nrpvt,ncol]/pivot;

        FOR nrow := 1 TO nrcmax DO {reduce non-pivot rows}
          IF nrow<>nrpvt THEN
            BEGIN
              temp := inverse[nrow,nrpvt];
              inverse[nrow,nrpvt] := 0.0;
              FOR ncol := 1 TO nrcmax DO
                inverse[nrow,ncol] := inverse[nrow,ncol]
                  -inverse[nrpvt,ncol]*temp;
            END;

      END;

  END;
```

```
WLDIS:
File:   MATPRT.TEXT          4  28-Jul-80


  PROCEDURE MATPRT(  {MATrix PRinT}
       {in}  name    : string; {name of matrix}
     VAR{in}  matrix  : mat4x4; {matrix of 4 rows X 4 columns}
       {in}  nrmax   : integer; {number of rows filled in matrix}
       {in}  ncmax   : integer); {number of columns filled in matrix}

    {HISTORY}
      {E H Schlosser     LEMSCO  28-Jul-80        Original code}

    {METHOD}

    {EXCEPTIONS}
      {None.}

    VAR
      nrow,ncol : integer;

    BEGIN
      writeln; writeln(name);
      FOR nrow := 1 TO nrmax DO
        BEGIN
          write('Row',nrow:3,'  ');
          FOR ncol := 1 TO ncmax DO
            write(matrix[nrow,ncol]:13:6,' ');
          writeln;
        END;
      writeln;
    END;
```

```
WLDIS:
File:   RDLINPUT.TEXT      4  29-Jul-80


  PROCEDURE RDLINPUT;  {ReaDLn from INPUT console & write prompt char}

  {HISTORY}
    {MARY ANN TOMPKINS  LEMSCO   04/03/80   ORIGINAL CODE}

  {METHOD}
    {POSITIONS TO A BEGINNING OF NEW INPUT LINE}

  BEGIN
    READLN;
    WRITE(')');
  END;
```

```
WLDIS:
File:   READICVL.TEXT       6  30-Jul-80


  PROCEDURE READICVL(   {READ Integer Channel Values & Labels from record}
    VAR{out} pointnum : integer;
    VAR{out} chanval  : ivec5; {vector of integer channel values}
    VAR{out} pixcount : integer; {count of pixels at point}
    VAR{out} labchars : pchar2; {secondary label if present, else primary}
    VAR{out} comment  : string; {optional comment (= 40 characters long}
    {=}
    VAR{in}  fileid   : interactive); {fileid of file}


    {HISTORY}
      {Mary Ann Tompkins          LEMSCO  25-Apr-80       Original code}
      {E H Schlosser              LEMSCO  29-Jul-80       Rewrite}

    {METHOD}
      {Read specifications from point/channel/label record of open file and
      return them.}
      {Point number 99 signifies a comment record, which is printed, but
      otherwise ignored.}
      {An open brace following the last label present signifies the start
      of an inline comment.}

    VAR
      nchan     : integer; {index for 4 channel values}
      prilabel  : string[2]; {primary label}
      seclabel  : string[2]; {optional secondary label}

    {EXTERNAL REFERENCES}
      {GETOKEN}

    BEGIN
      pointnum := 99;
      WHILE (pointnum=99) AND (NOT eof(fileid)) DO
        BEGIN
```

```
        labchars := '  ';
        prilabel := ' ';
        seclabel := ' ';
        comment := ' ';
        read(fileid,pointnum);

        IF pointnum=99 THEN
          BEGIN
            GETOKEN(comment,   60,'!',fileid);
            writeln(pointnum:3,'  ',comment);
          END;

        IF (pointnum()99) AND (NOT eof(fileid)) THEN
          BEGIN
            FOR nchan := 1 TO 4 DO
              read(fileid,chanval[nchan]);
            read(fileid,pixcount);
            GETOKEN(prilabel,   2,' ',fileid);
            GETOKEN(seclabel,   2,'(',fileid);
            IF length(seclabel))1 THEN
              BEGIN
                labchars[1] := seclabel[1];
                labchars[2] := seclabel[2];
              END
            ELSE IF length(prilabel))1 THEN
              BEGIN
                labchars[1] := prilabel[1];
                labchars[2] := prilabel[2];
              END;
            GETOKEN(comment,   30,'!',fileid);
            IF length(comment))1 THEN INSERT('(',comment,1);
          END;

      END;
  END;
```

```
WLDIS:
File:   UPCHAR.TEXT          4    8-May-80

  FUNCTION UPCHAR(byte:char):char;

    {HISTORY}
      {E H Schlosser     LEMSCO  4-Apr-80          Original code}

    {METHOD}
      {Convert all lowercase letters to uppercase.}

    BEGIN
      IF (byte('a') OR (byte)'z')
        THEN UPCHAR := byte
        ELSE UPCHAR := chr(ord(byte)-32);
    END;
```

```
WLDIS:
File:   VECPRT.TEXT          4  30-Jul-80


  PROCEDURE VECPRT(  {VECtor PRinT}
       {in}  name    : string; {name of vector}
     VAR{in}  vector  : vec5; {vector of 5 variables}
       {in}  ncmax   : integer); {number of columns filled in vector}

    {HISTORY}
      {E H Schlosser    LEMSCO  28-Jul-80       Original code}

    {METHOD}

    {EXCEPTIONS}
      {None.}

    VAR
      ncol : integer;

    BEGIN
      writeln; writeln(name);
      write('          ');
      FOR ncol := 1 TO ncmax DO
        write(vector[ncol]:13:6,' ');
      writeln;
    END;
```

```
WLDIS:
File:   WCOVAR.TEXT          8   5-Aug-80

  PROCEDURE WCOVAR(  {Weighted COVARiance matrix from means, data, & weights}
    VAR{out} covar   : mat4x4; {4 by 4 covariance matrix}
    {=}
    VAR{in}  mean    : vec5; {vector of means}
    VAR{in}  data    : i1500x4; {integer matrix of 1500 observ X 4 variables}
    VAR{in}  weight  : vec1500; {real vector of weights}
       {in}  nobmax  : integer; {number of observations (rows) filled in data}
       {in}  nvarmax : integer); {number of variables (columns) filled in data}

    {HISTORY}
      {E H Schlosser    LEMSCO  28-Jul-80       Original code}
      {E H Schlosser    LEMSCO  04-Aug-80       Do by 100 to maintain precision}
      {E H Schlosser    LEMSCO  05-Aug-80       Weighting}

    {METHOD}
      {Initialize upper triangular covariances.  Accumulate upper triangular
       covariances (100 observations at a time to maintain precision).  Copy
       final upper triangular covariances to lower triangular covariances.}

    {EXCEPTIONS}
      {None.}

    VAR
      nob        : integer; {observation number for all observations}
      nrow,ncol  : integer;
      covar100   : mat4x4; {upper triangular covariances for 100 observations}
      nob100     : integer; {observation number for 100 observations}


    Procedure COVADD100;
      {internal; ADD covar100 to covar, covar100 := [0], nob100 := 0}

      BEGIN {COVADD100}
        FOR nrow := 1 TO nvarmax DO
```

```
      FOR ncol := nrow TO nvarmax DO
        BEGIN
          covar[nrow,ncol] := covar[nrow,ncol] + covar100[nrow,ncol];
          covar100[nrow,ncol] := 0.0;
        END;
    nob100 := 0;
  END;


BEGIN (COVAR)

  {Initialize upper triangular covariances to all zeros}
  COVADD100;
  FOR nrow := 1 TO nvarmax DO
    FOR ncol := nrow TO nvarmax DO
      covar[nrow,ncol] := 0.0;

  {Accumulate upper triangular covariances}
  FOR nob := 1 TO nobmax DO
    BEGIN
      nob100 := nob100+1;
      FOR nrow := 1 TO nvarmax DO
        FOR ncol := nrow TO nvarmax DO
          covar100[nrow,ncol] := covar100[nrow,ncol] + weight[nob]*
            (data[nob,nrow]-mean[nrow])*(data[nob,ncol]-mean[ncol]);
      IF nob100>99 THEN COVADD100;
    END;
  IF nob100<>0 THEN COVADD100;

  {Copy upper triangular covariances to lower triangular}
  FOR nrow := 1 TO nvarmax DO
    FOR ncol := nrow TO nvarmax DO
      covar[ncol,nrow] := covar[nrow,ncol];

END;
```

```
WLDIS:
File:   WEIGH.TEXT          6   5-Aug-80


  PROCEDURE WEIGH(  {compute WEIGHts for array of data observations}
    VAR{out} weight    : vec1500; {real vector of weights}
    VAR{out} weightsum: real; {sum of weights}
    {=}
    VAR{in}  data      : i1500x4; {integer matrix of 1500 observ X 4 variables}
       {in}  nobmax    : integer; {number of observations (rows) filled in data}
       {in}  nvarmax   : integer; {number of variables (columns) filled in data}
       {in}  coefs     : vec5; {coefficients of function used in computing wts}
       {in}  threshold: real)); {value of function corresponding to zero weight}

    {HISTORY}
      {E H Schlosser    LEMSCO  05-Aug-80        Original code}

    {METHOD}
      {Interpolate weight from 0 where function has threshold value to 1
      where function has 0 value.}

    {EXCEPTIONS}
      {Negative weights are changed to 0.}

    VAR
      nob,nrow : integer;
      discfun  : real;
      invthresh: real;

    BEGIN

      weightsum := 0.0;
      invthresh := 1.0/threshold;

      FOR nob := 1 TO nobmax DO
        BEGIN
          discfun := coefs[nvarmax+1];
          FOR nrow := 1 TO nvarmax DO
```

```
        discfun := discfun + coefs[nrow]*data[nob,nrow];
      weight[nob] := (threshold-discfun)*invthresh;
      IF weight[nob]<0.0 THEN weight[nob] := 0.0;
      weightsum := weightsum+weight[nob];
    END;

END;
```

```
WLDIS:
File:   WLDIS.TEXT          10   5-Aug-80


  PROCEDURE WLDIS(  {Weighted Linear DIScriminant coeffs from labelled data}
    VAR{out} newcoefs  : vec5; {new coefficients (nvarmax gains & 1 bias) of
                                linear discriminant function normal to
                                discriminant hyper-plane}
    (=)
    VAR{in}  data1     : i1500x4; {data for class 1}
    VAR{in}  data2     : i1500x4; {data for class 2}
       {in}  nobmax1   : integer; {number of observations in class 1}
       {in}  nobmax2   : integer; {number of observations in class 2}
       {in}  nvarmax   : integer; {number of variables}
       {in}  oldcoefs  : vec5; {old coefficients used in computing weights}
       {in}  threshold : real)); {used in computing weights}


    {HISTORY}
      {E H Schlosser    LEMSCO  28-Jul-80       Original code}
      {E H Schlosser    LEMSCO  05-Aug-80       Weighting}

    {METHOD}
      {Compute means, covariances, inverse of pooled covariances.}

    {EXCEPTIONS}
      {None.}

    VAR
      weight1 : vec1500; {weights for observations in class 1}
      weight2 : vec1500; {weights for observations in class 2}
      weight1sum: real; {sum of weights for class 1}
      weight2sum: real; {sum of weights for class 2}
      mean1     : vec5; {means for class 1}
      mean2     : vec5; {means for class 2}
      meandif   : vec5; {difference of means}
      meansum   : vec5; {sum of means}
      covar1    : mat4x4; {covariance matrix for class 1
```

```
                    & pooled covariance matrix
                    & inverse)
  covar2     : mat4x4; {covariance matrix for class 2}
  determ     : real; {determinant}
  nrow,ncol  : integer;
  intercept  : real;
  d    : real; {}

BEGIN

  {Compute weights & sums of weights separately for class 1 & class 2}
  WEIGH(weight1,weight1sum,   data1,nobmax1,nvarmax,oldcoefs,threshold);
  FOR nrow := 1 TO nvarmax+1 DO {use negative coefficients for class 2}
    newcoefs[nrow] := -oldcoefs[nrow];
  WEIGH(weight2,weight2sum,   data2,nobmax2,nvarmax,newcoefs,threshold);

  {Compute weighted means separately for class 1 & class 2}
  WMEAN(mean1,   data1,weight1,weight1sum,nobmax1,nvarmax);
  VECPRT('class 1 weighted means',mean1,nvarmax);
  WMEAN(mean2,   data2,weight2,weight2sum,nobmax2,nvarmax);
  VECPRT('class 2 weighted means',mean2,nvarmax);

  {Compute sum & difference of means}
  FOR nrow := 1 TO nvarmax DO
    BEGIN
      meandif[nrow] := mean1[nrow] - mean2[nrow];
      meansum[nrow] := mean1[nrow] + mean2[nrow];
    END;
  VECPRT('difference of class means',meandif,nvarmax);
  VECPRT('sum of class means',meansum,nvarmax);

  {Compute weighted covariances separately for class 1 & class 2}
  WCOVAR(covar1,   mean1,data1,weight1,nobmax1,nvarmax);
  MATPRT('class 1 weighted covariance',covar1,nvarmax,nvarmax);
  WCOVAR(covar2,   mean2,data2,weight2,nobmax2,nvarmax);
  MATPRT('class 2 weighted covariance',covar2,nvarmax,nvarmax);

  {Pool covariance matrices}
  FOR nrow := 1 TO nvarmax DO
      FOR ncol := 1 TO nvarmax DO
```

```
        covari[nrow,ncol] := (covari[nrow,ncol]
          +covar2[nrow,ncol])/(weight1sum+weight2sum);
    MATPRT('pooled covariance',covari,nvarmax,nvarmax);

    {Solve for slopes of discriminant axis}
    MATINV(determ,covari,   covari,nvarmax);
    MATPRT('inverse of pooled covariance',covari,nvarmax,nvarmax);
    FOR nrow := 1 TO nvarmax DO
      BEGIN
        newcoefs[nrow] := 0.0;
        FOR ncol := 1 TO nvarmax DO
          newcoefs[nrow] := newcoefs[nrow]+covari[nrow,ncol]*meandif[ncol];
      END;

    {Solve for hyper-plane intercept on discriminant axis}
    intercept := 0.0;
    d := 0.0;
    FOR nrow := 1 TO nvarmax DO
      BEGIN
        d := d+meandif[nrow]*newcoefs[nrow];
        intercept := intercept+meansum[nrow]*newcoefs[nrow];
      END;
    newcoefs[nvarmax+1] := -0.5*intercept;

END;
```

```
WLDIS:
File:   WMEAN.TEXT          6   5-Aug-80


  PROCEDURE WMEAN(  {vector of Weighted MEANs from array of data}
    VAR{out} mean     : vec5; {vector of weighted means}
    {=}
    VAR{in}  data     : i1500x4; {integer matrix of 1500 observ X 4 variables}
    VAR{in}  weight   : vec1500; {real vector of weights}
       {in}  weightsum: real; {sum of weights}
       {in}  nobmax   : integer; {number of observations (rows) filled in data}
       {in}  nvarmax  : integer); {number of variables (columns) filled in data}

    {HISTORY}
      {E H Schlosser    LEMSCO  28-Jul-80       Original code}
      {E H Schlosser    LEMSCO  05-Aug-80       Weighting}

    {METHOD}
      {Initialize.  Accumulate weighted sums of data & sums of weights.
      Divide weighted sums of data by sums of weights.}

    {EXCEPTIONS}
      {None.}

    VAR
      nob,nrow   : integer;

    BEGIN
      {Initialize weighted sums of data to all zeros}
      FOR nrow := 1 TO nvarmax DO
        mean[nrow] := 0.0;

      {Accumulate weighted sums of data}
      FOR nob := 1 TO nobmax DO
        FOR nrow := 1 TO nvarmax DO
          mean[nrow] := mean[nrow] + data[nob,nrow]*weight[nob];

      {Divide weighted sums of data by sums of weights}
```

```
  FOR nrow := 1 TO nvarmax DO
    mean[nrow] := mean[nrow]/weightsum;

END;
```

```
WLDIS:
File:   WRCLALAB.TEXT      4  29-Jul-80


  PROCEDURE WRCLALAB:  (WRite CLAss & LABel table)

    (HISTORY)
      (Mary Ann Tompkins          LEMSCO  25-Apr-80       Original code)
      (E H Schlosser              LEMSCO  29-Jul-80       New names)

    (METHOD)
      (WRITE THE TABLE OF LABEL MAPPING TO CLASSES)

    (EXCEPTIONS)
      (NONE)

    VAR
      labrow,labcol : integer; (Komlabel[labrow,labcol])

    (GLOBAL REFERENCES)
      (KOMLDIS)

    BEGIN

      writeln;
      writeln('CLASS  LABEL(S) MAPPING TO CLASS');

      labcol := 0;
      REPEAT
        labcol := labcol + 1;
        IF Komlabel[1,labcol,1]()' ' THEN
          BEGIN
            WRITE(labcol,'      ');
            labrow := 0;
            REPEAT
              labrow := labrow + 1;
              WRITE(Komlabel[labrow,labcol],'  ');
            UNTIL labrow = 10;
```

```
        WRITELN;
      END;
  UNTIL labcol = 8;

END;
```

APPENDIX E
LINEAR DISCRIMINANT DATA

LEGEND FOR PIXEL LABELS E-2

SAMPLE INPUT DATA FILE E-3

COMMAND FILE E-4

DISCRIMINANT STATISTICS (FIRST ITERATION) E-7

DISCRIMINANT STATISTICS (LAST ITERATION) E-8

SUMMARY DISCRIMINANT PERFORMANCE E-9

DETAILED DISCRIMINANT PERFORMANCE E-15

MORE SUMMARY DISCRIMINANT PERFORMANCE E-54

LIST1:
File: LEGEND.TEXT 4 24-Jul-80

LEGEND FOR PIXEL LABELS

CL = Cloud

SH = Shadow

BS = Bare Soil

SD = Sand Dunes

WL = Wetlands

PA = Pavement

BR = Building Roofs

CO = Commercial

IN = Industrial

DT = Downtown

TP = Treatment Ponds

RL = River Light Blue

RM = River Medium Blue

RD = River Dark Blue

PL = Pond Light Blue

PM = Pond Medium Blue

PD = Pond Dark Blue

LL = Lake Light Blue

LM = Lake Medium Blue

LD = Lake Dark Blue

MX = Mixture Pixels

```
LIST1:
File:    WH-NY-070.TEXT      6  11-Aug-80


 99 WH-NY-070 PIXEL VALUES FOR CHANNELS: 1,2,3,4
501  22  13  07  03  01  LD  (1285,2307)
501  21  13  12  03  01  LD  (1286,2305)
501  26  19  16  04  01  LD  (1286,2313)
501  21  15  13  04  01  LD  (1287,2304)
501  21  15  14  05  01  LD  (1287,2308)
501  21  18  14  06  01  LD  (1287,2309)
501  25  20  14  03  01  LD  (1287,2312)
501  22  16  13  04  01  LD  (1288,2305)
 70  24  13  14  04  01  LD  (1331,2519)
 70  24  15  13  05  01  LD  (1331,2520)
 70  22  13  13  05  01  LD  (1332,2520)
 88  19  13  12  04  01  LD  (1345,2494)
 88  18  13  12  04  01  LD  (1345,2495)
 88  18  13  12  03  01  LD  (1346,2494)
 74  21  15  13  04  01  LD  (1353,2519)
 74  22  16  13  03  01  LD  (1354,2519)
 74  20  15  13  04  01  LD  (1355,2520)
 74  21  13  12  03  01  LD  (1356,2519)
 74  20  13  11  03  01  LD  (1357,2521)
 74  18  13  11  04  01  LD  (1358,2519)
 84  18  12  13  04  01  LD  (1364,2505)
 84  18  12  13  05  01  LD  (1365,2507)
 84  19  16  13  04  01  LD  (1366,2504)
 84  19  12  12  03  01  LD  (1366,2507)
 80  20  15  13  04  01  LD
511  19  14  21  10  01  WL
512  19  17  19  06  01  WL  PD  (SMALL POND IN MARSH)
513  20  17  23  08  01  WL  (VERY WET MARSH)
514  20  16  19  09  01  WL
515  18  16  24  11  01  WL
516  21  16  18  08  01  WL  (VERY WET MARSH)
517  19  17  21  07  01  WL  PD  (VERRRY SMALL POND IN MARSH)
518  21  17  22  10  01  WL
122  22  16  13  04  01  PD
```

```
LIST:
File:    WLDIS-LWNM.CMD      8    7-Aug-80


(WLDIS-LWNM) (LA,WA,NY,MT)
%+
X *WLINDISC
  heading,LA,WA,NY,MT LABELS  Date: %=  Time: %=
  class,1,TP,RL,RM,RD,PL,PM,PD,LL,LM,LD
  class,2,CL,BS,SD,WL,PA,BR,CO,IN,DT
  file,WH-LA-9734
  file,WH-LA-9749
  file,WH-LA-9723
  file,WH-LA-9691
  file,WH-WA-1440
  file,WH-WA-1448
  file,WH-WA-1468
  file,WH-WA-1484
  file,WH-WA-1490
  file,WH-WA-1511
  file,WH-WA-1513
  file,WH-WA-1535
  file,WH-WA-1582
  file,WH-NY-059
  file,WH-NY-062
  file,WH-NY-070
  file,WH-NY-076
  file,WH-NY-085
  file,WH-NY-091
  file,WH-NY-094
  file,WH-NY-096
  file,WH-NY-100
  file,BL-MT-9100
  file,BL-MT-9186
  file,BL-MT-9215
  fit
  %")"%=
  %")"%=
  %")"%=
  %")"%=
  %")"%=
  %")"%=
  %")"%=
  %")"%=
  %")"%=
  %")"%=
  %")"%=
  %")"%=
```

```
%")"%=
%")"%=
%"))"%=
file,WH-LA-9734,check
file,WH-LA-9749,check
file,WH-LA-9723,check
file,WH-LA-9691,check
file,WH-WA-1440,check
file,WH-WA-1448,check
file,WH-WA-1468,check
file,WH-WA-1484,check
file,WH-WA-1490,check
file,WH-WA-1511,check
file,WH-WA-1513,check
file,WH-WA-1535,check
file,WH-WA-1582,check
file,WH-NY-059,check
file,WH-NY-062,check
file,WH-NY-070,check
file,WH-NY-076,check
file,WH-NY-085,check
file,WH-NY-091,check
file,WH-NY-094,check
file,WH-NY-096,check
file,WH-NY-100,check
file,BL-MT-9100,check
file,BL-MT-9186,check
file,BL-MT-9215,check
%")"%=
%")"%=
%")"%=
%")"%=
%")"%=
%")"%=
%")"%=
%")"%=
%")"%=
%")"%=
%")"%=
%")"%=
%")"%=
%")"%=
%")"%=
%")"%=
%"))"%=
file,WH-LA-9734,check
file,WH-LA-9749,check
file,WH-LA-9723,check
file,WH-LA-9691,check
file,WH-WA-1440,check
file,WH-WA-1448,check
file,WH-WA-1468,check
file,WH-WA-1484,check
file,WH-WA-1490,check
file,WH-WA-1511,check
file,WH-WA-1513,check
file,WH-WA-1535,check
file,WH-WA-1582,check
file,WH-NY-059,check
file,WH-NY-062,check
file,WH-NY-070,check
file,WH-NY-076,check
```

```
file,WH-NY-085,check
file,WH-NY-091,check
file,WH-NY-094,check
file,WH-NY-096,check
file,WH-NY-100,check
file,BL-MT-9100,check
file,BL-MT-9186,check
file,BL-MT-9215,check
```

```
LINDISC:  LA,WA,NY,MT LABELS  DATE: 08/12/80  TIME: 10:00

discriminant threshold:  100000.


initial coefficients of linear discriminant function
          0.00000       0.00000       0.00000       0.00000       0.00000

 700 observations in class 1
 574 observations in class 2

class 1 weighted means
          19.2529       16.1029       12.7029       3.52143

class 2 weighted means
          24.7195       26.9094       29.0836       12.4216

difference of class means
          -5.46666      -10.8066      -16.3808      -8.90017

sum of class means
          43.9724       43.0123       41.7865       15.9430

class 1 weighted covariance
Row  1    13092.2       15427.8       12358.6       3058.71
Row  2    15427.8       32588.6       26193.4       5996.46
Row  3    12358.6       26193.4       29794.2       7489.46
Row  4     3058.71       5996.46       7489.46      2582.68


class 2 weighted covariance
Row  1    22497.8       29233.4       25546.5       8822.88
Row  2    29233.4       42615.3       35359.4      12243.9
Row  3    25546.5       35359.4       35444.0      12637.8
Row  4     8822.88      12243.9       12637.8       5477.97


pooled covariance
Row  1      27.9357       35.0559       29.7528       9.32620
Row  2      35.0559       59.0297       48.3146      14.3174
Row  3      29.7528       48.3146       51.2074      15.7985
Row  4       9.32620      14.3174       15.7985       6.32704


inverse of pooled covariance
Row  1       0.145409     -0.077553      0.002913     -0.046117
Row  2      -0.077553      0.117084     -0.082462      0.055270
Row  3       0.002913     -0.082462      0.171548     -0.246043
Row  4      -0.046117      0.055270     -0.246043      0.715322


final coefficients of linear discriminant function
(4 gains + 1 bias)

          0.405904      0.017550      0.254938      -2.68129      6.74572

  (class 1 ) 0.0)
  (class 2 ( 0.0)


))tab,.2
```

```
LINDISC:  LA,WA,NY,MT LABELS  DATE: 08/12/80  TIME: 10:00

discriminant threshold:       17.00


initial coefficients of linear discriminant function
          0.315332      0.031164      0.298985     -2.77817      7.15253

 700 observations in class 1
 574 observations in class 2

class 1 weighted means
          19.2840       16.5585       13.8114       4.10467

class 2 weighted means
          22.7156       23.9688       25.5721       10.5180

difference of class means
          -3.43156      -7.41034      -11.7607      -6.41330

sum of class means
          41.9996       40.5274       39.3835       14.6226

class 1 weighted covariance
Row  1    6535.26       8038.53       6784.66       1847.30
Row  2    8038.53       18432.2       15426.9       3633.89
Row  3    6984.66       15426.9       17341.7       4391.65
Row  4    1847.30       3633.89       4391.65       1472.35


class 2 weighted covariance
Row  1    7943.45       9844.37       8041.72       2389.18
Row  2    9844.37       13942.4       10813.8       3251.40
Row  3    8041.72       10813.8       10377.9       3232.26
Row  4    2389.18       3251.40       3232.26       1346.66

pooled covariance
Row  1      23.2824       28.7565       24.1631       6.81245
Row  2      28.7565       52.0597       42.1962       11.0719
Row  3      24.1631       42.1962       44.5743       12.2596
Row  4      6.81245       11.0719       12.2596       4.53309


inverse of pooled covariance
Row  1       0.139505     -0.070039      0.005039     -0.052214
Row  2      -0.070039      0.119413     -0.092933      0.064930
Row  3       0.005039     -0.092933      0.184763     -0.280274
Row  4      -0.052214      0.064930     -0.280274      0.898469


final coefficients of linear discriminant function
(4 gains + 1 bias)

          0.315889      0.031991      0.295913     -2.76792      7.12827

  (class 1 ) 0.0)
  (class 2 ( 0.0)


tab,.2
```

LINDISC: LA,WA,NY,MT LABELS DATE: 08/12/80 TIME: 10:00

coefficients of linear discriminant function

0.315889 0.031991 0.295913 -2.76792 7.12827

DISCRIM	Class1	Class2
-9.80	0	304
-9.60	0	3
-9.40	0	7
-9.20	0	12
-9.00	0	9
-8.80	0	6
-8.60	0	5
-8.40	0	6
-8.20	0	6
-8.00	0	11
-7.80	0	9
-7.60	0	4
-7.40	0	9
-7.20	0	6
-7.00	0	2
-6.80	0	6
-6.60	0	8
-6.40	0	7
-6.20	0	8
-6.00	0	6
-5.80	0	6
-5.60	0	3
-5.40	0	10
-5.20	0	8
-5.00	0	12
-4.80	0	3
-4.60	0	1
-4.40	0	11
-4.20	0	2
-4.00	0	6
-3.80	0	6
-3.60	0	3
-3.40	0	5
-3.20	0	1
-3.00	0	2
-2.80	0	4
-2.60	2	6
-2.40	0	2
-2.20	0	7
-2.00	1	6
-1.80	0	3
-1.60	1	6
-1.40	4	3
-1.20	0	5
-1.00	1	7
-0.80	0	1
-0.60	0	2
-0.40	0	0
-0.20	0	1
0.00	0	0
0.20	1	1
0.40	2	0
0.60	2	1
0.80	7	0
1.00	3	3
1.20	1	1

1.40	3	0
1.60	3	0
1.80	4	1
2.00	2	0
2.20	4	0
2.40	4	0
2.60	9	1
2.80	7	0
3.00	6	0
3.20	7	0
3.40	8	0
3.60	6	0
3.80	12	0
4.00	7	0
4.20	10	0
4.40	8	0
4.60	6	0
4.80	10	0
5.00	12	0
5.20	12	0
5.40	14	0
5.60	11	0
5.80	13	0
6.00	9	0
6.20	15	0
6.40	14	0
6.60	17	0
6.80	17	0
7.00	15	0
7.20	13	0
7.40	9	0
7.60	10	0
7.80	18	0
8.00	15	0
8.20	10	0
8.40	34	0
8.60	10	0
8.80	21	0
9.00	21	0
9.20	15	0
9.40	25	0
9.60	13	0
9.80	196	0
TOTAL	700	574

tab,.5

LINDISC: LA,WA,NY,MT LABELS DATE: 08/12/80 TIME: 10:00

coefficients of linear discriminant function

0.315889	0.031991	0.295913	-2.76792	7.12827

DISCRIM	Class1	Class2
-23.50	0	1
-23.00	0	0
-22.50	0	0
-22.00	0	0
-21.50	0	1
-21.00	0	2
-20.50	0	1
-20.00	0	1
-19.50	0	7
-19.00	0	5
-18.50	0	13
-18.00	0	4
-17.50	0	12
-17.00	0	12
-16.50	0	14
-16.00	0	13
-15.50	0	14
-15.00	0	20
-14.50	0	15
-14.00	0	13
-13.50	0	19
-13.00	0	19
-12.50	0	19
-12.00	0	12
-11.50	0	22
-11.00	0	25
-10.50	0	15
-10.00	0	24
-9.50	0	15
-9.00	0	20
-8.50	0	15
-8.00	0	23
-7.50	0	16
-7.00	0	10
-6.50	0	18
-6.00	0	20
-5.50	0	16
-5.00	0	20
-4.50	0	14
-4.00	0	9
-3.50	0	11
-3.00	0	6
-2.50	2	11
-2.00	1	13
-1.50	5	12
-1.00	1	11
-0.50	0	2
0.00	1	2
0.50	9	1
1.00	6	3
1.50	8	1
2.00	5	1
2.50	17	1
3.00	17	0
3.50	19	0
4.00	24	0

4.50	18	0
5.00	31	0
5.50	35	0
6.00	23	0
6.50	39	0
7.00	38	0
7.50	27	0
8.00	37	0
8.50	54	0
9.00	45	0
9.50	48	0
10.00	32	0
10.50	25	0
11.00	30	0
11.50	22	0
12.00	21	0
12.50	16	0
13.00	13	0
13.50	11	0
14.00	4	0
14.50	6	0
15.00	3	0
15.50	2	0
16.00	2	0
16.50	0	0
17.00	1	0
17.50	2	0
TOTAL	700	574

tab..1

LINDISC: LA,WA,NY,MT LABELS DATE: 08/12/80 TIME: 10:00

coefficients of linear discriminant function

0.315889 0.031991 0.295913 -2.76792 7.12827

DISCRIM	Class1	Class2
-4.90	0	475
-4.80	0	1
-4.70	0	0
-4.60	0	0
-4.50	0	3
-4.40	0	8
-4.30	0	3
-4.20	0	0
-4.10	0	3
-4.00	0	3
-3.90	0	1
-3.80	0	2
-3.70	0	4
-3.60	0	1
-3.50	0	1
-3.40	0	4
-3.30	0	1
-3.20	0	0
-3.10	0	2
-3.00	0	0
-2.90	0	1
-2.80	0	3
-2.70	0	1
-2.60	2	3
-2.50	0	4
-2.40	0	0
-2.30	0	3
-2.20	0	3
-2.10	0	5
-2.00	0	1
-1.90	1	4
-1.80	0	0
-1.70	1	1
-1.60	0	2
-1.50	0	4
-1.40	4	1
-1.30	0	4
-1.20	0	2
-1.10	0	1
-1.00	1	5
-0.90	0	3
-0.80	0	0
-0.70	0	1
-0.60	0	1
-0.50	0	0
-0.40	0	0
-0.30	0	0
-0.20	0	1
-0.10	0	0
0.00	0	0
0.10	1	0
0.20	0	1
0.30	0	0
0.40	1	0
0.50	3	0
0.60	0	0

0.70	5	1
0.80	2	0
0.90	1	1
1.00	1	2
1.10	1	0
1.20	1	0
1.30	2	1
1.40	1	0
1.50	1	0
1.60	1	0
1.70	3	0
1.80	1	1
1.90	1	0
2.00	2	0
2.10	1	0
2.20	0	0
2.30	3	0
2.40	4	0
2.50	1	0
2.60	6	1
2.70	3	0
2.80	2	0
2.90	5	0
3.00	3	0
3.10	2	0
3.20	5	0
3.30	6	0
3.40	4	0
3.50	3	0
3.60	2	0
3.70	4	0
3.80	7	0
3.90	2	0
4.00	5	0
4.10	4	0
4.20	6	0
4.30	3	0
4.40	5	0
4.50	6	0
4.60	1	0
4.70	3	0
4.80	6	0
4.90	561	0
TOTAL	700	574

)))
)file,WH-LA-9734,check

```
LINDISC:  LA,WA,NY,MT LABELS  DATE: 08/12/80  TIME: 10:00

CLASS  LABEL(S) MAPPING TO CLASS
1      TP  RL  RM  RD  PL  PM  PD  LL  LM  LD
2      CL  BS  SD  WL  PA  BR  CO  IN  DT


coefficients
              0.315889      0.031991      0.295913     -2.76792      7.12827

#?:WH-LA-9734.TEXT CHANNEL VALUES
PT#   CH1 CH2 CH3 CH4   #PX LAB CL DISCR
 #9   WH-LA-9734 PIXEL VALUES FOR CHANNELS: 1,2,3,4
507    19  22  18   4     1  LM  1   8.1 (1318,2544)
507    22  22  19   4     1  LM  1   9.3 (1318,2545)
507    21  23  20   6     1  LM  1   3.8 (1319,2543)
507    20  22  21   5     1  LM  1   6.5 (1320,2544)
508    17  17  22   9     1  BS  2  -5.4 (1322,2540)
508    17  18  21  12     1  BS  2 -13.9 (1323,2540)
508    17  19  21  10     1  BS  2  -8.4 (1323,2542)
508    17  19  21  11     1  BS  2 -11.1 (1324,2541)
508    16  18  22  11     1  BS  2 -11.2 (1326,2541)
509    15  15  16   7     1  BS  2  -2.3 (1332,2534)
509    17  20  23  12     1  BS  2 -13.3 (1333,2530)
509    18  20  19  11     1  BS  2 -11.4 (1333,2531)
509    17  17  18   9     1  BS  2  -6.5 (1334,2532)
509    17  15  17  10     1  BS  2  -9.7 (1335,2535)
509    17  16  18   8     1  BS  2  -3.8 (1336,2533)
509    16  16  20  10     1  BS  2  -9.1 (1337,2530)
509    16  16  15   8     1  BS  2  -5.0 (1337,2535)
509    16  16  16   7     1  BS  2  -1.9 (1338,2536--WET FIELD)
200    22  23  21   5     1  PL  1   7.2
506    18  15  12   3     1  LM  1   8.5 (1412,2385--MED BLUE BACKWATER)
506    17  14  11   4     1  LM  1   5.1 (1413,2386--MED BLUE BACKWATER)
506    16  14   8   3     1  LM  1   6.7 (1414,2385--MED BLUE BACKWATER)
506    17  12   8   3     1  LM  1   6.9 (1415,2387--MED BLUE BACKWATER)
126    12  10   8   2     1  LD  1   8.1
102    21  23  18   5     1  PL  1   6.0
501    16  13  20  10     1  WL  2  -9.2 (1464,2602)
501    16  11  20  10     1  WL  2  -9.2 (1464,2603)
501    15  11  19  10     1  WL  2  -9.8 (1465,2602)
501    15  14  18  10     1  WL  2 -10.0 (1465,2603)
503    17  13  19   9     1  WL  2  -6.4 (1465,2578)
503    19  14  22  11     1  WL  2 -10.4 (1465,2579)
503    18  16  19  10     1  WL  2  -8.7 (1466,2578)
503    19  16  24  11     1  WL  2  -9.7 (1466,2579)
505    14  11   7   2     1  LM  1   8.4 (1464,2471--MED BLUE BACKWATER)
505    16  15   7   2     1  LM  1   9.2 (1464,2476--MED BLUE BACKWATER)
505    14  10   6   3     1  LM  1   5.3 (1465,2474--MED BLUE BACKWATER)
505    15  13   8   3     1  LM  1   6.3 (1465,2476--MED BLUE BACKWATER)
505    16  10   8   3     1  LM  1   6.6 (1466,2472--MED BLUE BACKWATER)
505    13  11  10   3     1  LM  1   6.2 (1466,2473--MED BLUE BACKWATER)
502    16  12  19  10     1  WL  2  -9.5 (1468,1584)
502    14  12  19  11     1  WL  2 -12.9 (1468,2585)
502    16  14  20  10     1  WL  2  -9.1 (1468,2586)
502    17  16  20  11     1  WL  2 -11.5 (1468,2587)
502    13  13  20  10     1  WL  2 -10.1 (1469,2584)
502    16  12  20   8     1  WL  2  -3.7 (1469,2585)
502    16  12  15   9     1  WL  2  -7.9 (1469,2586)
502    16  13  13   9     1  WL  2  -8.5 (1469,2587)
502    16  13  17   9     1  WL  2  -7.3 (1470,2584)
502    15  13  17  10     1  WL  2 -10.4 (1470,2585)
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502   15  11  18  10    1  WL  2 -10.1 (1470,2586)
502   15  13  18  10    1  WL  2 -10.1 (1470,2587)
  2   19  18  15   3    1  RL  1   9.8
504   21  28  24   6    1  RL  1   5.2 (1484,2505)
504   21  25  24   5    1  RL  1   7.8 (1484,2510)
504   20  24  23   7    1  RL  1   1.6 (1485,2512)
504   21  25  23   7    1  RL  1   2.0 (1486,2515)
504   21  24  21   8    1  RL  1  -1.4 *ERR* (1487,2506--MISSISSIPPI RIVER)
504   19  24  21   7    1  RL  1   0.7 (1487,2511)
504   22  25  22   6    1  RL  1   4.8 (1488,2507)
504   20  25  24   6    1  RL  1   4.7 (1488,2509)
504   23  24  24   6    1  RL  1   5.7 (1492,2514)
504   19  24  23   8    1  RL  1  -1.4 *ERR* (1493,2509--MISSISSIPPI RIVER)
 14   21  22  15   3    1  RL  1  10.6
```

File,WH-LA-9749,check

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LINDISC:  LA,WA,NY,MT LABELS  DATE: 09/12/80  TIME: 10:00

CLASS  LABEL(S) MAPPING TO CLASS
1      TP  RL  RM  RD  PL  PM  PD  LL  LM  LD
2      CL  BS  SD  WL  PA  BR  CO  IN  DT


coefficients
            0.315889      0.031991      0.295913     -2.76792      7.12827

#5:WH-LA-9749.TEXT CHANNEL VALUES
FT#  CH1 CH2 CH3 CH4   #PX LAB CL DISCR
 99  WH-LA-9749 PIXEL VALUES FOR CHANNELS: 1,2,3,4
114   36  55  36   8    1  PL  1   8.8 (1552,1101)
114   31  46  34  11    1  MX  0  -2.0 (1552,1102--EDGE PIXEL)
114   34  50  36  11    1  MX  0  -0.3 (1552,1103--EDGE PIXEL)
114   33  60  43  11    1  PL  1   1.7  1553,1101)
110   19  22  13   2    1  PM  1  12.1
140   14   8   5   3    1  PD  1   5.0
122   13  10   7   2    1  LD  1   8.1
 64   20  17  18   4    1  LM  1   8.2
513   14  11   7   2    1  RM  1   8.4
503   18  19  25  12    1  BS  2 -12.4 (1649,994)
503   18  19  21  11    1  BS  2 -10.8 (1649,997)
503   21  22  24  12    1  BS  2 -11.6 (1650,995)
503   20  18  24  11    1  BS  2  -9.3 (1650,996)
503   19  20  25  13    1  BS  2 -14.8 (1651,995)
503   17  20  25  12    1  BS  2 -12.7 (1651,996)
503   17  18  21  11    1  BS  2 -11.2 (1652,994)
 66   17  12  12   1    1  LM  1  13.7
 24   14   8   5   1    1  LD  1  10.5
511   35  39  42  16    1  IN  2 -12.4 (1665,1061)
511   30  41  39  16    1  IN  2 -14.8 (1666,1060)
511   34  41  41  17    1  IN  2 -15.7 (1666,1062)
501   14  10  23  10    1  WL  2  -9.0 (1669,1113)
501   14  11  21  11    1  WL  2 -12.3 (1670,1112)
501   13   9  16   8    1  WL  2  -5.9 (1670,1113)
501   13  11  20  10    1  WL  2 -10.2 (1671,1113)
 28   16  10  12   3    1  TP  1   7.7
 42   21  25  21   5    1  LL  1   6.9 (1674,1118)
 42   20  25  25   6    1  LL  1   5.0 (1675,1117)
 42   19  25  24   5    1  LL  1   7.2 (1676,1116)
510   17  19  23  10    1  BS  2  -7.8 (1677,950)
510   16  20  20  10    1  BS  2  -8.9 (1678,950)
502   20  20  22   8    1  SH  0  -1.5 (1681,1030)
502   20  19  22   7    1  SH  0   1.2 (1681,1031)
502   23  24  25  10    1  DT  2  -5.1 (1681,1032)
502   24  24  29  12    1  DT  2  -9.2 (1681,1033)
502   22  27  33  13    1  DT  2 -11.3 (1681,1029)
502   22  27  28  10    1  DT  2  -4.5 (1682,1030)
502   19  22  21   9    1  DT  2  -4.9 (1682,1031)
502   19  21  23  11    1  DT  2  -9.8 (1682,1033)
502   25  30  31  14    1  DT  2 -13.6 (1683,1029)
502   25  27  27  12    1  DT  2  -9.3 (1683,1031)
512   14  10  10   2    1  RM  1   9.3
509   21  22  24   9    1  BR  2  -3.3
 10   18  20  20   6    1  TP  1   2.8
506   21  23  24  10    1  PA  2  -6.1 (1706,987)
506   20  22  21   9    1  PA  2  -4.5 (1707,986)
506   20  21  27  13    1  PA  2 -13.9 (1707,988)
506   21  24  27  11    1  PA  2  -7.9 (1708,986)
506   23  25  24  10    1  PA  2  -5.4 (1708,988)
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506   19  20  27  12    1  PA  2 -11.5 (1709,986)
506   20  22  26  11    1  PA  2  -8.6 (1710,987)
506   22  28  27  11    1  PA  2  -7.5 (1710,988)
506   23  25  31  13    1  PA  2 -11.6 (1711,986)
508   24  28  31  13    1  IN  2 -11.2 (1711,1042)
508   23  24  28  13    1  IN  2 -12.5 (1711,1043)
508   21  24  29  14    1  IN  2 -15.6 (1711,1044)
508   22  25  28  12    1  IN  2 -10.1 (1712,1042)
508   22  23  28  13    1  IN  2 -12.9 (1712,1046)
508   25  27  31  12    1  IN  2  -8.2 (1713,1043)
508   34  41  41  19    1  IN  2 -21.3 (1714,1045)
508   30  33  35  13    1  IN  2  -8.0 (1715,1045)
 20   17  16  10   3    1  TP  1   7.7
505   25  27  34  14    1  PA  2 -12.8 (1726,995)
505   28  31  30  13    1  PA  2 -10.1 (1726,996)
505   27  31  33  13    1  PA  2  -9.6 (1726,997)
505   26  29  27  12    1  PA  2  -9.0 (1727,995)
505   24  29  30  12    1  PA  2  -8.7 (1727,996)
505   26  30  31  15    1  PA  2 -16.0 (1727,997)
505   24  29  31  13    1  PA  2 -11.2 (1727,998)
507   23  25  29  12    1  PA  2  -9.4 (1729,1019)
507   26  30  29  12    1  PA  2  -8.3 (1729,1020)
507   32  37  32  14    1  PA  2 -10.9 (1729,1021)
507   22  27  28  12    1  PA  2 -10.0 (1730,1019)
507   25  33  33  15    1  PA  2 -15.7 (1730,1020)
507   31  42  44  18    1  PA  2 -18.5 (1730,1021)
507   30  42  42  16    1  PA  2 -13.9 (1730,1022)
504   27  27  33  15    1  PA  2 -15.2 (1732,1001)
504   28  31  33  14    1  PA  2 -12.0 (1732,1002)
504   27  30  34  16    1  PA  2 -17.6 (1732,1003)
504   31  38  40  17    1  PA  2 -17.1 (1733,1001)
504   30  35  34  14    1  PA  2 -11.0 (1733,1002)
504   26  30  30  14    1  PA  2 -13.6 (1733,1003)

)file,WH-LA-9723,check
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LINDISC: LA,WA,NY,MT LABELS DATE: 08/12/80 TIME: 10:00

CLASS LABEL(S) MAPPING TO CLASS
1 TP RL RM RD PL PM PD LL LM LD
2 CL BS SD WL PA BR CO IN DT

coefficients
0.315889 0.031991 0.295913 -2.76792 7.12827

*5:WH-LA-9723.TEXT CHANNEL VALUES

PT#	CH1	CH2	CH3	CH4	#PX	LAB	CL	DISCR	
39	WH-LA-9723 PIXEL VALUES FOR CHANNELS: 1,2,3,4								
16	19	20	16	4	1	PM	1	7.4	
505	22	25	27	13	1	BS	2	-13.1	(1658,2385)
505	21	25	28	13	1	BS	2	-13.1	(1658,2386)
505	21	25	30	14	1	BS	2	-15.3	(1659,2384)
503	20	18	14	4	1	RM	1	7.1	
504	17	16	11	4	1	RM	1	5.2	
501	23	23	32	15	1	CL	2	-16.9	(1681,2200)
501	24	23	28	14	1	CL	2	-15.0	(1681,2201)
501	24	24	29	13	1	CL	2	-11.9	(1681,2202)
501	21	20	27	15	1	CL	2	-19.1	(1682,2201)
501	19	20	24	11	1	CL	2	-9.6	(1682,2202)
502	21	19	23	11	1	CL	2	-9.3	(1681,2210)
502	21	20	28	13	1	CL	2	-13.3	(1681,2213)
512	19	20	30	13	1	CL	2	-13.3	(1682,2213)
82	15	13	9	3	1	PM	1	6.6	
84	12	11	7	2	1	PM	1	7.8	
68	20	18	12	2	1	LM	1	12.0	
52	21	24	20	5	1	LL	1	6.6	
58	19	22	15	3	1	LM	1	10.0	(58LG--1712,2224)
88	12	11	7	2	1	PM	1	7.8	
58	17	17	11	2	1	LM	1	10.8	(58T--1718,2244)
58	18	19	13	4	1	LM	1	6.2	(58SM--1719,2231)
90	19	17	14	3	1	PM	1	9.5	
59	17	16	11	3	1	LM	1	8.0	
507	16	12	16	7	1	WL	2	-2.1	
508	13	13	19	7	1	WL	2	-2.1	
509	16	12	18	8	1	WL	2	-4.3	
510	16	12	21	9	1	WL	2	-6.1	
511	14	12	19	9	1	WL	2	-7.4	
512	16	11	18	7	1	WL	2	-1.5	
513	16	12	16	7	1	WL	2	-2.1	
514	15	14	20	9	1	WL	2	-6.7	
116	18	17	12	3	1	LM	1	8.6	(116E--1760,2247)
116	18	18	12	3	1	LM	1	8.6	(116W--1760,2234)
506	20	23	22	5	1	RM	1	6.9	(1758,2413)
506	21	25	22	5	1	RM	1	7.2	(1760,2416)
506	21	23	21	5	1	RM	1	6.9	(1760,2417)
506	20	25	21	6	1	RM	1	3.9	(1760,2415)
506	18	24	23	6	1	RM	1	3.8	(1762,2413)
506	18	23	21	7	1	RM	1	0.4	(1763,2412)
506	20	23	21	5	1	RM	1	6.6	(1764,2417)
506	21	24	19	5	1	RM	1	6.3	(1765,2416)
506	19	25	24	6	1	RM	1	4.4	(1766,2416)
506	18	25	24	7	1	RM	1	1.3	(1767,2416--MISSISSIPPI RIVER)
506	22	24	20	6	1	RM	1	4.2	(1768,2415)
506	19	24	21	7	1	RM	1	0.7	(1769,2413)
506	20	23	22	5	1	RM	1	6.9	(1770,2412)
116	18	19	13	3	1	LM	1	9.0	(116S--1773,2242)
140	22	31	24	4	1	LL	1	11.1	

515	15	11	21	10	1	WL	2	-9.2
516	15	13	19	10	1	WL	2	-9.8
517	15	13	20	7	1	WL	2	-1.2
518	14	11	18	8	1	WL	2	-4.9
519	14	12	19	9	1	WL	2	-7.4
520	16	10	20	10	1	WL	2	-9.3
521	13	12	7	1	1	RM	1	10.9
136	21	25	17	4	1	LL	1	8.5
138	19	24	14	3	1	LL	1	9.7
522	15	13	8	2	1	RM	1	9.1

>file,WH-LA-9691,check

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LINDISC:  LA,WA,NY,MT LABELS  DATE: 08/12/80  TIME: 10:00

CLASS  LABEL(S) MAPPING TO CLASS
1      TP  RL  RM  RD  PL  PM  PD  LL  LM  LD
2      CL  BS  SD  WL  PA  BR  CO  IN  DT


coefficients
            0.315889      0.031991      0.295913     -2.76792      7.12827

*F:WH-LA-9691.TEXT CHANNEL VALUES
F#   CH1 CH2 CH3 CH4   #PX LAB CL DISCR
 99  WH-LA-9691 PIXEL VALUES FOR CHANNELS: 1,2,3,4
502   21  23  28  13     1  BS  2 -13.2 (1919,2389)
502   19  23  28  13     1  BS  2 -13.8 (1919,2390)
502   19  24  25  13     1  BS  2 -14.7 (1919,2391)
502   21  23  27  14     1  BS  2 -16.3 (1920,2389)
502   21  23  26  14     1  BS  2 -16.6 (1920,2390)
502   21  23  27  14     1  BS  2 -16.3 (1920,2391)
 24   13   9   8   2     1  LM  1   8.4
501   13  11   6   1     1  RM  1  10.6
508   20  24  19   6     1  RM  1   3.2 (1933,2360)
508   21  23  24   5     1  RM  1   7.8 (1934,2457)
508   21  23  24   5     1  RM  1   7.8 (1934,2458)
508   19  25  22   6     1  RM  1   3.8 (1934,2462)
508   20  26  23   4     1  RM  1  10.0 (1935,2460)
508   22  30  30   9     1  RM  1  -1.0 *ERR* (1936,2454--MISSISSIPPI RIVER)
508   19  30  30   8     1  RM  1   0.8 (1936,2455--MISSISSIPPI RIVER)
508   18  24  24   7     1  RM  1   1.3 (1937,2461--MISSISSIPPI RIVER))
508   19  24  21   7     1  RM  1   0.7 (1937,2464)
508   21  23  21   6     1  RM  1   4.1 (1938,2456)
508   21  24  23   5     1  RM  1   7.5 (1939,2457)
508   20  24  22   5     1  RM  1   6.9 (1939,2458)
508   19  25  23   5     1  RM  1   6.9 (1940,2458)
508   20  22  21   7     1  RM  1   1.0 (1941,2457)
  2   16  13  11   2     1  LM  1  10.3
503   13  10   6   1     1  LM  1  10.6 (MED BLUE BACKWATER)
504   20  18  11   3     1  LL  1   9.0 (LIGHT BLUE BACKWATER)
509   23  24  29  14     1  BS  2 -15.0 (1963,2573)
509   19  23  24  12     1  BS  2 -12.2 (1964,2571)
509   20  22  25  13     1  BS  2 -14.4 (1965,2574)
509   21  24  27  14     1  BS  2 -16.2 (1967,2573)
509   23  31  31  15     1  BS  2 -17.0 (1969,2573)
 46   14   9  10   1     1  LD  1  12.0 (1970,2546)
 46   14   9  10   2     1  LD  1   9.3 (1970,2550)
 46   12   8   8   3     1  LD  1   5.2 (1970,2547)
 46   13  10   5   3     1  LD  1   4.7 (1970,2549)
 46   13  11   8   2     1  LD  1   8.4 (1970,2551)
 46   13   9   9   1     1  LD  1  11.4 (1972,2546)
 46   12   9   9   2     1  LD  1   8.3 (1972,2552)
 38   17  16  12   2     1  LM  1  11.0
510   25  27  33  15     1  BS  2 -15.9 (1989,2525)
510   21  24  31  14     1  BS  2 -15.0 (1989,2527)
510   22  25  27  13     1  BS  2 -13.1 (1990,2526)
 50   12   9  12   2     1  PD  1   9.2 (2003,2553)
 50   13  10  12   4     1  PD  1   4.0 (2003,2555)
 50   16  10  12   2     1  PD  1  10.5 (2004,2554)
 50   14   9  13   2     1  PD  1  10.1 (2005,2553)
 58   15  12  13   2     1  LD  1  10.6
110   16  12  14   3     1  LM  1   8.4
 72   13  10  11   4     1  LD  1   3.7
506   21  24  22   4     1  RM  1  10.0 (2035,2611)
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506   22  23  19   5    1  RM  1   6.6 (2036,2616)
506   20  22  21   5    1  RM  1   6.5 (2037,2609)
506   18  25  23   6    1  RM  1   3.8 (2038,2613)
506   18  24  20   7    1  RM  1   0.1 (2039,2614--MISSISSIPPI RIVER)
506   21  23  20   6    1  RM  1   3.8 (2040,2612)
506   20  26  22   6    1  RM  1   4.2 (2041,2612)
507   21  24  23   7    1  RM  1   2.0 (2043,2513)
507   22  25  24   7    1  RM  1   2.6 (2044,2512)
507   19  24  23   8    1  RM  1  -1.4 *ERR* (2045,2505--MISSISSIPPI RIVER)
507   21  24  21   8    1  RM  1  -1.4 *ERR* (2045,2513--MISSISSIPPI RIVER)
507   21  25  24   5    1  RM  1   7.8 (2046,2502)
507   21  24  22   6    1  RM  1   4.4 (2047,2505)
507   19  25  22   5    1  RM  1   6.6 (2048,2507)
507   20  24  21   7    1  RM  1   1.1 (2049,2512)
507   22  24  23   4    1  RM  1  10.6 (2050,2508)
507   19  23  21   7    1  RM  1   0.7 (2051,2506)
112   13  11   8   2    1  LM  1   8.4
505   12   9   4   2    1  LD  1   6.9

)file,WH-WA-1140,check
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LINDISC:  LA,WA,NY,MT LABELS  DATE: 08/12/80  TIME: 10:00

CLASS  LABEL(S) MAPPING TO CLASS
1      TP  RL  RM  RD  PL  PM  PD  LL  LM  LD
2      CL  BS  SD  WL  PA  BR  CO  IN  DT


coefficients
            0.315889      0.031991      0.295913     -2.76792      7.12827

*5:WH-WA-1440.TEXT CHANNEL VALUES
PT#  CH1 CH2 CH3 CH4  #PX LAB CL DISCR
 99  WH-WA-1440 PIXEL VALUES FOR CHANNELS: 1,2,3,4
513   13   6   4   0    1  LD  1  12.6 (225,2627)
513   10   6   4   2    1  LD  1   6.1 (225,2637)
513   12   6   4   1    1  LD  1   9.5 (226,2628)
513   11   4   3   1    1  LD  1   8.9 (227,2630)
513    8   5   3   2    1  LD  1   5.2 (227,2640)
513   14   6   3  10    1  MX  0 -15.0 (228,2631--VEG IN BIG DRK LAKE)
513   12   5   3   0    1  LD  1  12.0 (229,2638)
513   12   8   3   2    1  LD  1   6.5 (230,2628)
513   13   7   7   1    1  LD  1  10.8 (231,2626)
513   12   7   4   3    1  LD  1   4.0 (231,2631)
506   12   8   4   2    1  LD  1   6.8 (233,2559)
506   12   8   4   3    1  LD  1   4.1 (233,2531)
506   14   8   6   1    1  LD  1  10.8 (234,2530)
506   14   9   3   0    1  LD  1  12.7 (235,2529)
509   13   7   3   1    1  LD  1   9.6 (236,2532)
509   13   7   5   0    1  LD  1  12.9 (237,2533)
506   14  10   6   2    1  LD  1   8.1 (238,2530)
506   13   9   4   2    1  LD  1   7.2 (239,2532)
604   18  15  20   8    1  IN  2  -2.9 (SLAG)
603   19  18  20   9    1  IN  2  -5.3 (SLAG)
601   43  50  43  15    1  MX  0  -6.5 (WASTE POND--UNRESOLVED)
600   41  47  38  15    1  MX  0  -8.7 (WASTE POND--UNRESOLVED)
605   35  38  35  13    1  IN  2  -6.2 (ALUM PLANT)
606   31  33  27  10    1  IN  2  -1.7 (ALUM PLANT)
607   26  24  23   9    1  IN  2  -2.0 (ALUM PLANT)
608   22  22  22   8    1  IN  2  -0.9 (BAUXITE MILL)
609   21  21  19   7    1  IN  2   0.7 *ERR* (BAUXITE MILL)
610   21  21  19   8    1  IN  2  -2.1 (BAUXITE MILL)
512   28  31  37  17    1  PA  2 -19.1 (349,2648)
512   30  34  37  15    1  PA  2 -12.9 (349,2649)
512   28  32  32  15    1  PA  2 -15.1 (349,2650)
512   27  32  34  15    1  PA  2 -14.8 (350,2648)
503   21  26  28  14    1  PA  2 -15.9 (360,2220)
503   21  22  28  12    1  PA  2 -10.5 (360,2221)
503   25  23  28  12    1  PA  2  -9.2 (360,2222)
503   21  23  29  13    1  PA  2 -12.9 (361,2219)
503   20  26  29  13    1  PA  2 -13.1 (361,2220)
503   23  23  28  13    1  PA  2 -12.6 (361,2222)
502   23  23  23   7    1  BR  2   2.6 *ERR* (385,2483--DRK BLDG ROOF)
502   25  28  27  10    1  BR  2  -3.8 (386,2481)
502   22  24  24   8    1  BR  2  -0.2 (387,2478--DRK BLDG ROOF)
502   22  26  25   9    1  BR  2  -2.6 (387,2485)
502   28  30  31  13    1  BR  2  -9.9 (388,2481)
502   27  33  31  12    1  BR  2  -7.3 (389,2482)
502   33  41  38  15    1  BR  2 -11.4 (390,2480)
502   33  39  40  16    1  BR  2 -13.6 (390,2487)
502   32  37  37  14    1  BR  2  -9.4 (391,2483)
502   33  37  37  14    1  BR  2  -9.1 (391,2486)
502   21  21  20   7    1  BR  2   1.0 *ERR* (393,2479--DRK BLDG ROOF)
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502	22	21	20	7	1	BR	2	1.3	*ERR* (394,2478--DRK BLDG ROOF)
502	29	34	33	15	1	BR	2	-14.4	(394,2481)
502	31	34	34	16	1	BR	2	-16.2	(394,2482)
502	31	39	39	17	1	BR	2	-17.3	(394,2483)
514	25	30	32	14	1	BS	2	-13.3	(398,2255)
514	27	26	23	10	1	BS	2	-4.4	(398,2257)
514	26	27	31	12	1	BS	2	-7.8	(399,2255)
514	26	28	30	10	1	BS	2	-2.6	(400,2255)
514	26	30	31	11	1	BS	2	-5.0	(400,2256)
514	23	28	25	9	1	BS	2	-2.2	(400,2257--RR YARD)
514	30	35	34	13	1	BS	2	-8.2	(401,2256)
514	32	39	35	16	1	BS	2	-15.4	(402,2255)
514	29	32	33	14	1	BS	2	-11.7	(402,2256)
514	23	26	28	11	1	BS	2	-6.9	(402,2257)
507	32	39	35	15	1	BR	2	-12.7	(400,2261)
507	31	36	35	13	1	BR	2	-7.6	(400,2262)
507	35	45	43	18	1	BR	2	-17.5	(401,2261)
507	46	56	50	20	1	BR	2	-17.1	(401,2263)
511	14	7	3	1	1	LM	1	9.9	(420,2632)
511	10	7	3	1	1	LM	1	8.6	(420,2634)
511	10	7	3	2	1	LM	1	5.9	(421,2635)
511	14	8	5	2	1	LM	1	7.8	(422,2632)
511	13	7	4	0	1	LM	1	12.6	(423,2637)
511	11	9	5	2	1	LM	1	6.8	(424,2631)
511	13	8	5	1	1	LM	1	10.2	(424,2634)
511	12	5	3	9	1	MX	0	-12.9	(425,2636--VEG IN BIG DRK LAKE)
511	13	8	3	2	1	LM	1	5.8	(427,2632)
505	13	7	3	1	1	RD	1	9.6	
16	14	9	5	2	1	PM	1	7.8	
504	30	33	35	15	1	IN	2	-13.5	(449,2297)
504	27	29	30	11	1	IN	2	-5.0	(449,2298)
504	35	45	40	18	1	IN	2	-18.4	(449,2300)
504	33	39	38	14	1	IN	2	-8.7	(450,2297)
504	27	32	30	12	1	IN	2	-7.7	(450,2298)
504	29	34	35	15	1	IN	2	-13.8	(450,2300)
504	35	42	39	15	1	IN	2	-10.5	(451,2298)
510	29	32	35	16	1	CO	2	-16.6	(444,2434)
510	29	34	33	14	1	CO	2	-11.6	(444,2435)
510	29	32	33	12	1	CO	2	-6.1	(444,2437)
510	28	32	28	12	1	CO	2	-7.9	(445,2433)
510	30	32	31	12	1	CO	2	-6.4	(445,2435)
510	30	35	33	13	1	CO	2	-8.5	(445,2436)
510	30	34	34	14	1	CO	2	-11.0	(446,2433)
510	28	30	28	14	1	CO	2	-13.5	(446,2434)
510	28	32	39	16	1	CO	2	-15.7	(446,2437)
6	32	23	11	2	1	PM	1	15.7	(454,2309)
6	32	20	11	3	1	PM	1	12.8	(454,2310)
6	37	35	30	10	1	MX	0	1.1	(455,2309--EDGE)
6	30	22	8	3	1	PM	1	11.4	(455,2310)
14	32	25	11	2	1	PM	1	15.8	(454,2349)
14	32	28	12	2	1	PM	1	16.1	(454,2350)
14	35	31	17	4	1	PM	1	13.1	(454,2349)
14	30	29	17	5	1	PM	1	8.7	(455,2350)
8	25	15	6	2	1	PM	1	11.7	(456,2304)
4	31	30	18	5	1	PM	1	9.4	(459,2317)
4	31	19	9	1	1	PM	1	17.4	(460,2317)
4	31	24	13	6	1	PM	1	4.9	(461,2318)
515	36	41	39	15	1	IN	2	-10.2	(464,2288)
515	31	39	37	16	1	IN	2	-15.2	(464,2290)
515	30	37	37	15	1	IN	2	-12.8	(464,2292)
515	41	47	40	15	1	IN	2	-8.1	(465,2288)
515	31	34	31	13	1	IN	2	-8.8	(465,2289)

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515   32  36  37  15    1  IN  2 -12.2 (466,2290)
515   27  29  30  12    1  IN  2  -7.8 (467,2288)
515   37  43  43  18    1  IN  2 -16.9 (467,2291)
515   33  38  40  17    1  IN  2 -16.4 (467,2292)
515   49  59  53  20    1  IN  2 -15.2 (468,2291)
508   25  28  30  12    1  DT  2  -8.4 (474,2249)
508   29  29  33  16    1  DT  2 -17.3 (474,2252)
508   21  20  20   7    1  DT  2   0.9 *ERR* (475,2249--DRK BLDG ROOF)
508   23  20  19   9    1  DT  2  -4.3 (475,2250)
508   24  23  20   9    1  DT  2  -3.5 (475,2251)
508   23  26  29   9    1  DT  2  -1.1 (475,2253)
508   21  24  27  10    1  DT  2  -5.2 (476,2250)
508   22  24  25  10    1  DT  2  -5.4 (476,2251)
508   21  24  25  11    1  DT  2  -8.5 (476,2252)
508   22  26  27  11    1  DT  2  -7.5 (476,2253)

)file,WH-WA-1148,check
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LINDISC: LA,WA,NY,MT LABELS  DATE: 08/12/80  TIME: 10:00

CLASS  LABEL(S) MAPPING TO CLASS
1      TP  RL  RM  RD  PL  PM  PD  LL  LM  LD
2      CL  BS  SD  WL  PA  BR  CO  IN  DT


Coefficients
              0.315889      0.031991      0.295913     -2.76792      7.12827

*5,WH-WA 1448.TEXT CHANNEL VALUES
FT*  CH1 CH2 CH3 CH4  *PX LAB CL DISCR
 99  WH-WA-1448 PIXEL VALUES FOR CHANNEL: 1,2,3,4
503   18  18  21   9    1  SH  0  -5.3 (447,809)
503   18  18  20  11    1  SH  0 -11.1 (447,810)
503   17  18  20   9    1  SH  0  -5.9 (448,809)
503   17  18  20  10    1  SH  0  -8.7 (448,810)
503   18  18  24  10    1  SH  0  -7.2 (449,810)
503   20  22  26  14    1  SH  0 -16.9 (450,809)
503   20  22  28  12    1  SH  0 -10.8 (450,810)
502   16   8   3   1    1  LD  1  10.6 (446,871)
502   16   8   4   3    1  LD  1   5.3 (447,866)
502   16  10   4   0    1  LD  1  13.7 (447,870)
502   14   9   4   1    1  LD  1  10.3 (448,872)
502   13  10   3   1    1  LD  1   9.7 (449,866)
502   15  10   3   1    1  LD  1  10.3 (450,872)
502   14   8   3   2    1  LD  1   7.2 (451,868)
501   13   8   4   1    1  LD  1   9.9 (448,963)
501   15   8   3   1    1  LD  1  10.2 (450,961)
501   15   8   3   0    1  LD  1  13.0 (451,959)
501   17   8   3   0    1  LD  1  13.6 (451,963)
501   16   8   3   1    1  LD  1  10.6 (452,958)
501   16   8   3   0    1  LD  1  13.3 (453,964)
501   14   8   4   1    1  LD  1  10.2 (454,962)
504   16  12  21  11    1  SH  0 -11.7 (467,919)
504   16  14  20  10    1  SH  0  -9.1 (467,920)
504   17  20  24  12    1  SH  0 -13.0 (467,922)
504   19  16  18   8    1  SH  0  -3.2 (468,919)
504   20  19  21  11    1  SH  0 -10.2 (468,921)
504   18  19  19   9    1  SH  0  -5.9 (469,920)
504   20  23  23  12    1  SH  0 -12.2 (469,922)
504   21  22  29  14    1  SH  0 -15.7 (470,919)
504   19  21  25  10    1  SH  0  -6.5 (470,921)
504   18  20  21   8    1  SH  0  -2.5 (471,921)
504   19  20  25  12    1  SH  0 -12.0 (471,922)
505   16  13  22  11    1  SH  0 -11.3 (482,988)
505   16  15  19  10    1  SH  0  -9.4 (482,989)
505   17  16  18   9    1  SH  0  -6.6 (482,990)
505   18  19  23  11    1  SH  0 -10.2 (482,991)
505   18  19  20   9    1  SH  0  -5.6 (483,898)
505   19  20  21   9    1  SH  0  -4.9 (484,989)
506   19  18  25  12    1  SH  0 -12.1 (507,926)
506   18  19  24  11    1  SH  0  -9.9 (507,928)
506   19  19  18  10    1  SH  0  -8.6 (508,927)
506   19  20  23  11    1  SH  0  -9.9 (508,928)
507   18  18  31  12    1  WL  2 -10.7
508   18  16  29  11    1  WL  2  -8.5
102   12   9   7   2    1  LD  1   7.7
 80   15  13  12   3    1  LM  1   7.5

)file,WH-WA-1468,check
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LINDISC:  LA,WA,NY,MT LABELS  DATE: 08/12/80  TIME: 10:00

CLASS  LABEL(S) MAPPING TO CLASS
1      TP  RL  RM  RD  PL  PM  PD  LL  LM  LD
2      CL  BS  SD  WL  PA  BR  CO  IN  DT


coefficients
              0.315889      0.031991      0.295913     -2.76792      7.12827

*5:WH-WA-1468.TEXT CHANNEL VALUES
PT#  CH1 CH2 CH3 CH4  *CY LAB CL DISCR
 59  WH-WA-1468 PIXEL VALUES FOR CHANNELS 1,2,3,4
 34   19  19  17   4    1  LM  1   7.7
 32   19  19  18   5    1  LM  1   5.2
 70   12   9   5   1    1  LD  1   9.9
  8   24  18  19   6    1  LM  1   4.3
176   16  12  10   2    1  LD  1  10.0
172   14   9   6   1    1  LD  1  10.8
272   26  30  27   7    1  LL  1   4.9 (SML LT BLUE LAKE)
282   30  37  31   7    1  LL  1   7.6
334   17  12   8   2    1  LD  1   9.7
258   16  12   9   3    1  LM  1   6.9
501   28  34  35  17    1  BS  2 -19.6 (931,614)
501   28  32  25  14    1  BS  2 -14.4 (931,615)
501   27  32  32  14    1  BS  2 -12.6 (932,616)
501   30  32  35  16    1  BS  2 -16.3 (933,614)
501   26  30  34  15    1  BS  2 -15.2 (933,616)
346   18  12   6   2    1  LM  1   9.4 (953,910)
346   19  12   5   1    1  LM  1  12.2 (953,912)
346   20  12   5   1    1  LM  1  12.5 (954,909)
346   19  13   8   3    1  LM  1   7.6 (955,906)
346   19  13   4   2    1  LM  1   9.2 (955,912)
346   18  13   6   1    1  LM  1  12.2 (956,907)
346   19  11   5   0    1  LM  1  15.0 (957,910)
386   15  11   7   2    1  LM  1   8.8
386   16   9   7   2    1  LD  1   9.0
362   24  20  25   6    1  LM  1   6.1

)file,WH-WA-1484,check
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```
LINDISC:  LA,WA,NY,MT LABELS  DATE: 08/12/80  TIME: 10:00

CLASS  LABEL(S) MAPPING TO CLASS
1      TP  RL  RM  RD  PL  PM  PD  LL  LM  LD
2      CL  BS  SD  WL  PA  BR  CO  IN  DT


coefficients
              0.315889      0.031991      0.295913     -2.76792      7.12827

*5:WH-WA-1484.TEXT CHANNEL VALUES
PT=  CH1 CH2 CH3 CH4  #PX LAB CL DISCR
  9  WH-WA-1484 PIXEL VALUES FOR CHANNELS: 1,2,3,4
 48   13   6   3   2    1  LD  1   6.8
108   13   9   2   1    1  LD  1   9.3
180   14   8   3   1    1  LD  1   9.9
515   26  33  35  14    1  BS  2 -12.0 (993,1685)
515   25  30  31  15    1  BS  2 -16.4 (994,1684)
514   25  30  31  14    1  BS  2 -13.6
518   25  28  30  13    1  PA  2 -11.2
519   23  28  32  14    1  PA  2 -14.0
520   23  28  29  13    1  PA  2 -12.1
521   23  28  31  13    1  PA  2 -11.5
176   24  24  23   5    1  LL  1   8.4
502   24  29  30  13    1  BS  2 -11.5 (1041,1737)
502   23  30  30  13    1  BS  2 -11.8 (1042,1735)
502   19  23  27  10    1  BS  2  -5.8 (1043,1736)
502   25  29  31  15    1  BS  2 -16.4 (1044,1734)
188   13   8   5   0    1  LM  1  13.0
505   24  30  31  13    1  PA  2 -11.1 (1079,1728)
505   23  29  31  14    1  PA  2 -14.3 (1080,1727)
505   25  28  31  13    1  PA  2 -10.9 (1080,1729)
505   26  30  29  13    1  PA  2 -11.1 (1081,1729)
505   25  29  28  12    1  PA  2  -9.0 (1082,1727)
505   27  29  30  12    1  PA  2  -7.8 (1083,1726)
505   22  27  31  13    1  PA  2 -11.9 (1083,1730)
503   25  28  30  14    1  BS  2 -14.0 (1086,1910)
503   24  28  29  12    1  BS  2  -9.0 (1087,1909)
503   25  28  31  12    1  BS  2  -8.1 (1088,1909)
503   23  28  28  14    1  BS  2 -15.2 (1088,1911)
503   24  29  31  14    1  BS  2 -13.9 (1089,1908)
503   24  25  30  13    1  BS  2 -11.6 (1089,1911)
504   26  30  31  12    1  DT  2  -7.7 (1091,1729)
504   25  29  31  13    1  DT  2 -10.9 (1092,1727)
504   32  39  37  18    1  DT  2 -20.4 (1093,1729)
509   14  12  20   7    1  WL  2  -1.5
510   14  12  19   6    1  ??  0   0.9 (DARK VEG WETLAND)
511   14  11  19   6    1  ??  0   0.9 (DARK VEG WETLAND)
512   16  12  21   9    1  WL  2  -6.1
513   13  12  21   7    1  WL  2  -1.5
501   21  20   9   0    1  LM  1  17.1
290   16  12   7   1    1  LM  1  11.9
352   12   9   6   1    1  LD  1  10.2

)file,WH-WA-1490,check
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LINDISC:  LA,WA,NY,MT LABELS  DATE: 08/12/80  TIME: 10:00

CLASS  LABEL(S) MAPPING TO CLASS
1      TP  RL  RM  RD  PL  PM  PD  LL  LM  LD
2      CL  BS  SD  WL  PA  BR  CO  IN  DT


Coefficients
                0.315889        0.031991        0.295913       -2.76792        7.12827

*:WH-WA-1490.TEXT CHANNEL VALUES
PT#   CH1 CH2 CH3 CH4  #PX LAB CL DISCR
 -9  WH-WA-1490 PIXEL VALUES FOR CHANNELS: 1,2,3,4
 -2   18  12   7   2    1  10  0   9.7
 -2   18  11   7   2    1  10  0   9.7
 -2   18  12  12   4    1  10  0   5.7
  4   21  16  19   2    1  LM  1  14.4 (1086,619)
  4   23  15  18   3    1  LM  1  11.9 (1086,620)
  4   21  15  16   3    1  LM  1  10.7 (1086,621)
  4   23  17  21   6    1  LM  1   4.5 (1086,622)
  4   24  16  18   4    1  LM  1   9.5 (1087,622)
  1   23  29  30  13    1  BS  2 -11.8 (1091,678)
  2   22  26  28  13    1  BS  2 -12.8 (1092,678)
  3   22  26  26  13    1  BS  2 -13.4 (1092,679)
  0   19  15  11   4    1  LD  1   5.8 (1095,766)
  0   18  12   7   2    1  LD  1   9.7 (1096,767)
  0   16  12   7   2    1  LD  1   9.1 (1097,768)
  8   26  23  23   7    1  PM  1   3.5 (1109,600)
  8   16  12   8   0    1  LD  1  14.9
 10   12  12   8   0    1  PM  1  13.7
  9   26  30  21  15    1  SH  0 -19.0 (1163,954)
  9   26  30  31  13    1  SH  0 -10.5 (1163,955)
  9   26  29  31  14    1  SH  0 -13.3 (1164,954)
  6   20  20  18   5    1  PM  1   5.6
 24   17  17  10   2    1  LM  1  10.5
504   35  38  34  13    1  DT  2  -6.5 (1198,833)
504   31  36  29  12    1  DT  2  -6.6 (1198,834)
504   32  38  24  15    1  DT  2 -16.0 (1198,835)
504   39  46  44  19    1  DT  2 -18.7 (1198,836)
504   33  37  35  15    1  DT  2 -12.4 (1199,833)
504   35  45  40  15    1  DT  2 -10.1 (1199,835)
504   35  45  40  17    1  DT  2 -15.6 (1199,836)
506   28  33  34  15    1  PA  2 -14.4
507   29  34  35  16    1  PA  2 -16.6
508   29  34  33  15    1  PA  2 -14.4

)file,WH-WA-1511,check
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LINDISC: LA,WA,NY,MT LABELS  DATE: 08/12/80  TIME: 10:00

CLASS  LABEL(S) MAPPING TO CLASS
1      TP  RL  RM  RD  PL  PM  PD  LL  LM  LD
2      CL  BS  SD  WL  PA  BR  CO  IN  DT


coefficients
              0.315889      0.031991      0.295913     -2.76792      7.12827

=?;WH-WA-1511.TEXT CHANNEL VALUES
PT#  CH1 CH2 CH3 CH4  #PX LAB CL DISCR
 -9  WH-WA-1511 PIXEL VALUES FOR CHANNELS: 1,2,3,4
 22   15  10   4   1    1  LD  1  10.6
  3   25  28  26  10    1  BS  2  -4.1 (1236,1504)
  3   28  28  28  10    1  BS  2  -2.5 (1237,1503)
504   26  29  30  12    1  BS  2  -8.1 (1235,1506)
504   26  29  27  11    1  BS  2  -6.2 (1236,1505)
 .4   28  32  31  13    1  BS  2  -9.8 (1237,1506)
504   28  34  37  17    1  BS  2 -19.0 (1237,1507)
502   31  36  34  14    1  PA  2 -10.6 (1270,1466)
502   24  29  31  13    1  PA  2 -11.2 (1271,1466)
106   20  19  12   2    1  LM  1  12.1
122   23  31  28   7    1  PL  1   4.3 (LT. SMALL POND)
 70   20  17  18   3    1  LM  1  11.0
501   25  29  28  12    1  BS  2  -9.0 (1370,1394)
501   25  31  28  11    1  BS  2  -6.1 (1370,1395)
501   27  36  40  16    1  BS  2 -15.6 (1371,1393)
501   22  27  28  12    1  BS  2 -10.0 (1371,1396)
140   12   9   6   2    1  LD  1   7.4
 77   16  11   7   2    1  LD  1   9.1

)file,WH-WA-1513,check
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LINDISC:  LA,WA,NY,MT LABELS  DATE: 08/12/80  TIME: 10:00

CLASS  LABEL(S) MAPPING TO CLASS
1      TP  RL  RM  RD  PL  PM  PD  LL  LM  LD
2      CL  BS  SD  WL  PA  BR  CO  IN  DT


coefficients
              0.315889      0.031991      0.295913     -2.76792      7.12827

*5:WH-WA-1513.TEXT CHANNEL VALUES
PT#  CH1 CH2 CH3 CH4  #PX LAB CL DISCR
 99  WH-WA-1513 PIXEL VALUES FOR CHANNELS: 1,2,3,4
501   23  19   7   1    1  LM  1  14.3 (1200,2151)
501   20  20   7   2    1  LM  1  10.6 (1201,2148)
501   21  19   7   1    1  LM  1  13.7 (1202,2153)
501   22  19   7   2    1  LM  1  11.2 (1203,2152)
501   22  18   6   1    1  LM  1  13.7 (1204,2150)
501   21  18   7   2    1  LM  1  10.9 (1205,2151)
501   19  19   7   1    1  LM  1  13.0 (1206,2149)
 30   14  11   8   2    1  LD  1   8.7
503   21  19   7   1    1  LM  1  13.7
 38   17  18  14   3    1  LD  1   8.9
 56   16  19  13   2    1  LM  1  11.1
505   28  36  36  14    1  BS  2 -11.0
506   27  33  34  15    1  BS  2 -14.7
502   26  32  35  16    1  BS  2 -17.6 (1423,1856)
502   24  30  29  13    1  BS  2 -11.7 (1423,1858)
502   25  28  31  12    1  BS  2  -8.1 (1424,1857)
502   27  29  31  15    1  BS  2 -15.8 (1424,1858)
504   21  25  25  12    1  BS  2 -11.3 (1431,2149)
504   17  18  17   9    1  BS  2  -6.6 (1432,2146)
504   20  22  24  11    1  BS  2  -9.2 (1432,2148)

)file,WH-WA-1535,check
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LINDISC:  LA,WA,NY,MT LABELS  DATE: 08/12/80  TIME: 10:00

CLASS  LABEL(S) MAPPING TO CLASS
1      TP  RL  RM  RD  PL  PM  PD  LL  LM  LD
2      CL  BS  SD  WL  PA  BR  CO  IN  DT


coefficients
            0.315889      0.031991      0.295913     -2.76792      7.12827

#5:WH-WA-1535.TEXT CHANNEL VALUES
PT#  CH1 CH2 CH3 CH4  #PX LAB CL DISCR
 89  WH-WA-1535 PIXEL VALUES FOR CHANNELS: 1,2,3,4
513   18  11   5   1    1  LD  1  11.9 (1689,187)
513   20  10   6   1    1  LD  1  12.8 (1690,189)
513   16  11   5   2    1  LD  1   8.5 (1691,188)
513   19  11   7   1    1  LD  1  12.8 (1692,190)
513   19  10   6   2    1  LD  1   9.7 (1693,190)
513   17  10   7   2    1  LD  1   9.4 (1694,188)
513   18  12   6   2    1  LD  1   9.4 (1695,188)
516   31  28  33  14    1  SD  2 -11.2 (1704,196)
516   26  31  32  14    1  SD  2 -12.9 (1705,197)
516   29  34  37  16    1  SD  2 -16.0 (1705,202)
516   30  32  32  13    1  SD  2  -8.9 (1706,204)
516   29  32  35  17    1  SD  2 -19.4 (1707,203)
516   29  29  34  14    1  SD  2 -11.5 (1708,199)
514   29  32  31  11    1  SD  2  -4.0 (1705,256)
514   30  36  41  17    1  SD  2 -17.2 (1706,252)
514   30  34  41  16    1  SD  2 -14.5 (1706,253)
514   29  32  35  14    1  SD  2 -11.1 (1707,254)
514   29  31  29   9    1  SD  2   1.0 *ERR* (1708,255--BLUE SAND DUNE)
514   29  29  29  10    1  SD  2  -1.9 (1708,258)
514   30  33  31  11    1  SD  2  -3.6 (1709,258)
514   31  31  33  11    1  SD  2  -2.8 (1710,257)
514   28  32  29  11    1  SD  2  -4.9 (1711,254)
514   32  34  31  14    1  SD  2 -11.3 (1711,257)
515   29  31  31  10    1  SD  2  -1.2 (1714,261)
515   27  30  30  10    1  SD  2  -2.2 (1715,262)
515   30  30  31  10    1  SD  2  -0.9 (1715,264--BLUE SAND DUNE)
515   31  36  33  12    1  SD  2  -5.4 (1716,260)
515   32  34  37  17    1  SD  2 -17.8 (1717,262)
515   28  32  31  10    1  SD  2  -1.5 (1718,261)
515   30  36  32  12    1  SD  2  -6.0 (1718,262)
515   29  33  34  12    1  SD  2  -5.8 (1719,262)
515   30  38  40  17    1  SD  2 -17.4 (1719,265)
515   31  33  33  14    1  SD  2 -11.0 (1720,259)
517   31  33  37  15    1  SD  2 -12.6 (1720,218)
517   27  30  30  10    1  SD  2  -2.2 (1721,212)
517   31  32  33  11    1  SD  2  -2.7 (1722,214)
517   33  36  40  15    1  SD  2 -11.0 (1722,218)
517   29  31  28  10    1  SD  2  -2.1 (1723,215)
517   32  34  35  13    1  SD  2  -7.3 (1723,217)
517   30  34  34  12    1  SD  2  -5.5 (1724,213)
517   30  33  40  17    1  SD  2 -17.6 (1725,215)
517   31  38  37  16    1  SD  2 -15.2 (1726,218)
518   30  34  39  12    1  SD  2  -4.0 (1730,134)
518   30  32  34  15    1  SD  2 -13.8 (1730,138)
518   30  33  35  14    1  SD  2 -10.7 (1731,135)
518   30  33  34  13    1  SD  2  -8.3 (1731,136)
518   29  36  37  15    1  SD  2 -13.1 (1731,142)
518   29  36  37  16    1  SD  2 -15.9 (1732,133)
518   31  33  39  16    1  SD  2 -14.8 (1732,139)
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510	17	12	5	2	1	LD	1	8.8	(1741,108)
510	17	15	8	3	1	LD	1	7.0	(1742,109)
510	17	10	4	1	1	LD	1	11.2	(1743,105)
510	19	15	15	4	1	LD	1	7.0	(1743,110)
510	17	11	6	2	1	LD	1	9.1	(1744,108)
510	16	10	5	2	1	LD	1	8.4	(1745,105)
510	16	10	6	1	1	LD	1	11.5	(1746,106)
510	15	12	4	2	1	LD	1	7.9	(1747,109)
507	22	19	19	5	1	LM	1	6.5	(1761,393)
507	22	20	15	2	1	LM	1	13.6	(1761,394)
507	23	19	15	2	1	LM	1	13.9	(1762,393)
507	23	24	17	3	1	LM	1	11.9	(1762,395)
507	22	24	15	3	1	LM	1	11.0	(1763,394)
507	29	26	16	3	1	LM	1	13.6	(1764,395)
507	26	26	23	7	1	LM	1	3.6	(1765,394)
511	17	10	3	2	1	LD	1	8.2	(1781,233)
511	20	9	3	1	1	LD	1	11.9	(1782,234)
501	18	9	3	2	1	LD	1	8.5	(1783,236)
511	18	10	4	1	1	LD	1	11.5	(1785,234)
511	17	10	3	1	1	LD	1	10.9	(1786,237)
511	19	10	3	1	1	LD	1	11.6	(1787,236)
44	18	11	6	2	1	LD	1	9.4	
519	29	29	27	11	1	SD	2	-5.2	(1800,63)
519	32	32	35	13	1	SD	2	-7.4	(1801,65)
519	30	36	39	16	1	SD	2	-15.0	(1802,65)
519	29	36	34	13	1	SD	2	-8.5	(1803,61)
519	29	32	37	15	1	SD	2	-13.3	(1803,65)
519	28	27	24	8	1	SD	2	1.8	*ERR* (1804,60--BLUE SAND DUNE)
519	30	30	29	11	1	SD	2	-4.3	(1805,62)
519	30	35	37	17	1	SD	2	-18.4	(1805,66)
519	31	31	31	10	1	SD	2	-0.6	(1806,63--BLUE SAND DUNE)
519	29	32	32	14	1	SD	2	-12.0	(1807,62)
519	28	29	28	10	1	SD	2	-2.5	(1808,66)
512	26	31	30	12	1	BS	2	-8.0	(1812,540)
512	25	28	27	11	1	BS	2	-6.5	(1812,541)
502	26	34	37	14	1	BS	2	-11.4	(1813,543)
60	18	11	5	1	1	LM	1	11.9	
509	18	9	4	2	1	LM	1	8.7	(1817,241)
509	20	10	3	0	1	LM	1	14.7	(1818,238)
509	18	10	5	0	1	LM	1	14.6	(1819,240)
509	17	10	3	2	1	LM	1	8.2	(1819,241)
509	19	12	5	2	1	LM	1	9.5	(1821,241)
509	18	10	4	1	1	LM	1	11.5	(1822,242)
509	19	10	6	1	1	LM	1	12.5	(1823,240)
92	14	8	6	1	1	LD	1	10.8	
284	27	23	28	6	1	LL	1	8.1	
508	31	36	37	15	1	BS	2	-12.5	(1836,122)
508	33	42	42	18	1	BS	2	-18.5	(1837,119)
508	32	37	39	17	1	BS	2	-17.1	(1837,123)
156	17	9	5	2	1	LM	1	8.7	
204	16	9	5	1	1	LM	1	11.2	
503	23	18	17	6	1	LM	1	3.4	(1855,61)
503	23	20	10	2	1	LM	1	12.5	(1855,62)
503	22	22	12	3	1	LM	1	10.0	(1856,64)
503	24	20	11	3	1	LM	1	10.3	(1857,61)
503	24	21	9	2	1	LM	1	12.5	(1857,64)
504	33	39	42	17	1	BS	2	-15.8	(1867,499)
504	30	39	41	16	1	BS	2	-14.3	(1868,498)
512	17	12	6	2	1	LD	1	9.1	
505	29	34	35	14	1	BS	2	-11.0	(1909,362)
505	30	39	36	16	1	BS	2	-15.8	(1910,363)
512	26	30	30	13	1	BS	2	-10.8	(1918,268)

```
512   21   27   31   12     1   BS   2   -9.4 (1919,267)
512   21   23   26   10     1   BS   2   -5.5 (1920,268)
512   23   25   25   10     1   BS   2   -5.1 (1921,269)
512   28   36   36   16     1   BS   2  -16.5 (1922,270)
512   29   39   45   16     1   BS   2  -13.4 (1923,269)
354   21   16   19    4     1   LM   1    8.8
511   33   35   33   12     1   BS   2   -4.8 (1943,516--WET FIELD)
511   37   45   45   17     1   BS   2  -13.5 (1943,518)
511   32   36   33   11     1   BS   2   -2.3 (1944,516--WET FIELD)
511   36   44   44   18     1   BS   2  -16.9 (1944,519)
511   33   39   42   18     1   BS   2  -18.6 (1945,519)
370   15    9   11    2     1   LD   1    9.9
438   21   16    7    2     1   LM   1   10.8

)file,WH-WA-1582,check
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LINDISC:  LA,WA,NY,MT LABELS  DATE: 08/12/80  TIME: 10:00

CLASS  LABEL(S) MAPPING TO CLASS
1      CP  RL  RM  RD  PL  PM  PD  LL  LM  LD
2      CL  BS  SD  WL  PA  BR  CO  IN  DT


coefficients
              0.315889      0.031991      0.295913     -2.76792      7.12827

#5:WH-WA-1582.TEXT CHANNEL VALUES
PT#  CH1 CH2 CH3 CH4  #PX LAB CL DISCR
 99  WH-WA-1582 PIXEL VALUES FOR CHANNELS:  1,2,3,4
509   35  45  50  20    1  IN  2 -20.9 (1949,639)
509   33  37  40  17    1  IN  2 -16.5 (1949,640)
509   31  35  37  15    1  IN  2 -12.5 (1949,641)
509   35  42  45  18    1  IN  2 -17.0 (1949,642)
509   31  34  35  14    1  IN  2 -10.4 (1950,641)
505   40  44  43  16    1  DT  2 -10.4 (1988,505)
505   33  41  39  15    1  DT  2 -11.1 (1988,506)
505   33  33  35  14    1  DT  2  -9.8 (1989,503)
505   33  38  40  18    1  DT  2 -19.2 (1989,504)
505   35  36  42  20    1  DT  2  23.6 (1989,505)
505   35  41  42  18    1  DT  2 -17.9 (1989,507)
 48   26  29  25   6    1  PL  1   7.1 (1995,559)
 48   26  29  21   5    1  PL  1   8.6 (1995,560)
 48   28  30  23   4    1  PL  1  12.7 (1996,559)
 48   25  30  21   6    1  PL  1   5.6 (1996,560)
 98   25  24  31   9    1  MX  0   0.1
506   31  34  37  14    1  PA  2  -9.8 (2011,503)
506   31  34  42  16    1  PA  2 -13.8 (2011,504)
506   35  42  46  18    1  PA  2 -16.7 (2011,505)
506   26  25  25   9    1  PA  2  -1.4 (2011,507--DARK PAVING)
506   27  28  30  11    1  PA  2  -5.0 (2012,503)
506   33  41  36  14    1  PA  2  -9.2 (2012,506)
506   27  29  30  14    1  PA  2 -13.3 (2012,507)
506   27  29  31  13    1  PA  2 -10.2 (2013,503)
506   30  36  33  12    1  PA  2  -5.7 (2013,504)
506   30  33  33  13    1  PA  2  -8.6 (2013,505)
506   30  33  33  14    1  PA  2 -11.3 (2013,506)
507   39  47  50  20    1  BS  2 -19.6 (2040,480)
507   39  47  48  18    1  BS  2 -14.7 (2040,481)
507   39  48  44  17    1  BS  2 -13.1 (2041,482)
507   37  42  46  18    1  BS  2 -16.1 (2041,483)
 58   28  31  24   7    1  PL  1   4.7
 82   18  13   8   3    1  LM  1   7.3 (2097,486)
 82   18  15  13   5    1  LM  1   3.3 (2097,487)
 82   18  14   7   2    1  LM  1   9.8 (2098,485)
 82   19  14   7   2    1  LM  1  10.1 (2098,486)
 82   19  12  11   2    1  LM  1  11.2 (2098,487)
 84   19  14  14   5    1  PM  1   3.9 (2107,511)
501   23  18  16   6    1  LM  1   3.1 (2113,717)
 98   20  16  11   1    1  PM  1  14.4
504   19  12   4   3    1  LM  1   6.4 (2121,735)
504   18  12   5   3    1  LM  1   6.4 (2121,739)
504   18  11   6   1    1  LM  1  12.2 (2122,739)
504   18  12   6   2    1  LM  1   9.4 (2123,735)
504   19  13   6   1    1  LM  1  12.6 (2124,732)
504   20  13   6   1    1  LM  1  12.9 (2124,734)
504   19  11   5   2    1  LM  1   9.4 (2125,736)
502   19  12   5   2    1  LM  1   9.5 (2128,744)
502   18  14   7   2    1  LM  1   9.8 (2128,745)
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502	17	12	6	2	1	LM	1	9.1	(2129,746)
502	19	11	6	1	1	LM	1	12.5	(2130,744)
502	21	13	6	1	1	LM	1	13.2	(2130,745)
502	20	11	6	2	1	LM	1	10.0	(2130,746)
122	18	12	4	3	1	LM	1	6.1	(2133,608)
122	17	12	5	2	1	LM	1	8.8	(2133,609)
122	17	11	5	1	1	LM	1	11.6	(2133,610)
122	16	9	5	1	1	LM	1	11.5	(2134,608)
122	18	10	6	1	1	LM	1	12.1	(2134,610)
144	19	15	11	3	1	LM	1	8.6	
130	15	11	6	3	1	LM	1	5.7	(2155,602)
130	17	10	8	1	1	LM	1	12.4	(2156,601)
503	20	13	5	2	1	LM	1	9.8	(2154,759)
503	18	13	6	0	1	LM	1	15.0	(2155,758)
503	18	13	6	2	1	LM	1	9.5	(2155,759)
503	17	13	6	2	1	LM	1	9.2	(2155,760)
503	19	11	7	2	1	LM	1	10.0	(2156,760)
118	19	16	13	4	1	PD	1	6.4	(2159,741)
508	26	29	37	16	1	BS	2	-17.1	(2178,497)
508	26	34	37	15	1	BS	2	-14.1	(2178,499)
508	28	34	37	15	1	BS	2	-13.5	(2179,497)
508	29	34	37	15	1	BS	2	-13.2	(2179,498)
508	29	34	37	17	1	BS	2	-18.7	(2179,499)
136	15	10	4	1	1	LM	1	10.6	(2190,622)
136	16	11	5	2	1	LM	1	8.5	(2190,623)
136	17	10	3	1	1	LM	1	10.9	(2191,621)
136	16	10	4	1	1	LM	1	10.9	(2192,622)
132	19	13	11	2	1	PM	1	11.3	
244	18	13	8	3	1	LM	1	7.3	(2191,879)
244	18	10	10	2	1	LM	1	10.6	(2191,880)
244	19	13	12	5	1	LM	1	3.3	(2192,880)
242	19	17	8	2	1	LM	1	10.5	
510	33	28	29	13	1	BS	2	-12.1	(2239,495)
510	22	28	28	12	1	BS	2	-10.0	(2240,495)
510	22	29	28	11	1	BS	2	-7.2	(2040,497)
510	22	27	25	10	1	BS	2	-5.3	(2241,494)
510	24	25	28	10	1	BS	2	-3.9	(2241,495)
510	22	27	28	12	1	BS	2	-10.0	(2241,498)
510	23	27	27	10	1	BS	2	-4.4	(2242,498)
510	23	27	27	11	1	BS	2	-7.2	(2242,499)

file,NH-NY-059,check

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LINDISC:  LA,WA,NY,MT LABELS  DATE: 08/12/80  TIME: 10:00

CLASS  LABEL(S) MAPPING TO CLASS
1      TP  RL  RM  RD  PL  PM  PD  LL  LM  LD
2      CL  BS  SD  WL  PA  BR  CO  IN  DT


coefficients
            0.315889      0.031991      0.295913     -2.76792      7.12827

#5:WH-NY-059.TEXT CHANNEL VALUES
FT#  CH1 CH2 CH3 CH4  #PX LAB CL DISCR
 99  WH-NY-059 PIXEL VALUES FOR CHANNELS: 1,2,3,4
 25   22  19  22   7    1  PD  1   1.8 (1459,743)
 25   21  18  22   6    1  PD  1   4.2 (1460,743)
 25   22  15  18   6    1  PD  1   3.3 (1460,744)
 32   24  18  16   6    1  PD  1   3.4
 82   19  15  11   5    1  PD  1   3.0
 55   22  17  17   5    1  PD  1   5.8
102   19  13  15   4    1  PD  1   6.9
 92   19  15  15   5    1  PD  1   4.2 (1526,703)
 92   19  14  17   5    1  PD  1   4.8 (1527,703)
152   22  17  17   6    1  PD  1   3.0 (1546,734)
152   21  16  19   7    1  PD  1   0.5 (1547,734--VERY DARK POND)
501   24  23  30  12    1  BS  2  -8.9
502   23  19  23  11    1  BS  2  -8.6
503   21  18  27  11    1  BS  2  -8.1
504   20  18  23  13    1  BS  2 -15.2
505   20  18  24  12    1  BS  2 -12.1
506   22  22  26  12    1  BS  2 -10.7
507   19  19  21  12    1  BS  2 -13.3
541   21  19  22  12    1  BS  2 -12.3
542   21  18  23  11    1  BS  2  -9.3
543   20  17  24  10    1  BS  2  -6.6
544   24  19  29  15    1  BS  2 -17.6
511   23  18  23  10    1  WL  2  -5.9
512   23  19  25  11    1  WL  2  -8.0
513   22  19  27  12    1  WL  2 -10.5
531   18  11  10   3    1  LD  1   7.8
532   18  11  11   2    1  LD  1  10.9
533   18  11   8   4    1  LD  1   4.5
534   17  12   9   2    1  LD  1  10.0
535   19  11  12   2    1  LD  1  11.5
536   18  11  12   5    1  LD  1   2.9
537   16  12  10   5    1  LD  1   1.7
538   19  13  11   3    1  LD  1   8.5
516   19  13  11   3    1  LD  1   8.5
517   20  13  15   2    1  LD  1  12.8
518   18  11  12   5    1  LD  1   2.9
519   21  13  12   3    1  LD  1   9.4
520   20  13  13   4    1  LD  1   6.6
521   21  12   6   4    1  LD  1   4.8
523   19  11  11   3    1  LD  1   8.4
524   18  12  12   3    1  LD  1   8.4
525   18  12  11   5    1  LD  1   2.6
526   16  11  12   3    1  LD  1   7.8
527   19  11  11   3    1  LD  1   8.4
259   19  16  19   7    1  MX  0  -0.1 (1740,771--PARTLY DRAINED POND)
259   19  15  19   6    1  PD  1   2.6 (1740,770)

)file,WH-NY-062,check
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LINDISC:  LA,WA,NY,MT LABELS  DATE: 08/12/80  TIME: 10:00

CLASS  LABEL(S) MAPPING TO CLASS
1      TP  RL  RM  RD  PL  PM  PD  LL  LM  LD
2      CL  BS  SD  WL  PA  BR  CO  IN  DT


coefficients
              0.315889       0.031991       0.295913      -2.76792       7.12827

#5:WH-NY-062.TEXT CHANNEL VALUES
PT#  CH1 CH2 CH3 CH4  #PX LAB CL DISCR
 99  WH-NY-062 PIXEL VALUES FOR CHANNEL: 1,2,3,4
511   35  35  47  19    1  DT  2 -19.4
 26   32  28  18   7    1  PD  1   4.1
 24   28  21  15   5    1  PD  1   7.2
501   31  28  37  17    1  WL  2 -18.3
502   31  30  46  18    1  WL  2 -18.3
503   31  28  41  16    1  WL  2 -14.3
504   30  28  36  17    1  WL  2 -18.9
505   30  31  39  15    1  WL  2 -12.4
 36   22  18  19   7    1  PD  1   0.9
518   31  23  16   5    1  LD  1   8.6
519   29  20  11   3    1  LD  1  11.9
520   27  19  12   4    1  LD  1   8.7
521   30  18  15   4    1  LD  1  10.5
522   28  18  13   4    1  LD  1   9.3
523   25  13  12   4    1  LD  1   7.9
524   24  16  12   4    1  LD  1   7.7
525   24  16  13   3    1  LD  1  10.8
531   22  17  14   5    1  LD  1   4.9
532   22  16  13   4    1  LD  1   7.4
533   22  15  13  10    1  CL  2  -9.3 (LT CLOUD OVER LAKE)
534   21  13  12   4    1  LD  1   6.7
535   21  13  13   3    1  LD  1   9.7
536   21  12   9   2    1  LD  1  11.3
541   22  14  14   5    1  LD  1   4.8
542   22  16  15   7    1  ??  0  -0.3 (V LT CLOUD OVER LAKE)
543   25  14  14   5    1  LD  1   5.8
544   25  16  13   4    1  LD  1   8.3
545   22  16  15   6    1  LD  1   2.4
546   25  17  17   7    1  LD  1   1.2
547   22  16  15   6    1  LD  1   2.4
548   22  16  15   4    1  LD  1   8.0
549   21  16  15   6    1  LD  1   2.1
 90   22  18  16   5    1  LD  1   5.5
552   22  18  23  11    1  BS  2  -9.0
553   21  19  23  11    1  BS  2  -9.3
554   23  20  21  10    1  BS  2  -6.4
555   22  20  27  10    1  BS  2  -5.0
561   21  17  19  10    1  BS  2  -7.8
562   23  16  18  10    1  BS  2  -7.4
563   21  18  19  10    1  BS  2  -7.7
564   19  17  20  10    1  BS  2  -8.1
565   19  17  23  12    1  BS  2 -12.7
566   19  17  21  11    1  BS  2 -10.6
567   20  18  21  11    1  BS  2 -10.2
568   20  17  23  13    1  BS  2 -15.2
569   18  17  20  11    1  BS  2 -11.2
511   39  42  46  20    1  DT  2 -21.0

)file,WH-NY-070,check
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LINDISC:  LA,WA,NY,MT LABELS  DATE: 08/12/80  TIME: 10:00

CLASS  LABEL(S) MAPPING TO CLASS
1      TP  RL  RM  RD  PL  PM  PD  LL  LM  LD
2      CL  BS  SD  WL  PA  BR  CO  IN  DT


coefficients
              0.315889      0.031991      0.295913     -2.76792      7.12827

*:WH-NY-070.TEXT CHANNEL VALUES
F  #  CH1 CH2 CH3 CH4  #PX LAB CL DISCR
 -9  WH-NY-070 PIXEL VALUES FOR CHANNELS: 1,2,3,4
 1   22  13   7   3    1  LD  1   8.3 (1285,2307)
 1   21  13  12   3    1  LD  1   9.4 (1286,2305)
 1   26  19  16   4    1  LD  1   9.6 (1286,2313)
 1   21  15  13   4    1  LD  1   7.0 (1287,2304)
 1   21  15  14   5    1  LD  1   4.5 (1287,2308)
 1   21  18  14   6    1  LD  1   1.9 (1287,2309)
 1   25  20  14   3    1  LD  1  11.5 (1287,2312)
 1   22  16  13   4    1  LD  1   7.4 (1288,2305)
 0   24  13  14   4    1  LD  1   8.2 (1331,2519)
 0   24  15  13   5    1  LD  1   5.2 (1331,2520)
 0   22  13  13   5    1  LD  1   4.5 (1332,2520)
 8   19  13  12   4    1  LD  1   6.0 (1345,2494)
 8   18  13  12   4    1  LD  1   5.7 (1345,2495)
 8   18  13  12   3    1  LD  1   8.5 (1346,2494)
 4   21  15  13   4    1  LD  1   7.0 (1353,2519)
 4   22  16  13   3    1  LD  1  10.1 (1354,2519)
 4   20  15  13   4    1  LD  1   6.7 (1355,2520)
 4   21  13  12   3    1  LD  1   9.4 (1356,2519)
 4   20  13  11   3    1  LD  1   8.8 (1357,2521)
 4   18  13  11   4    1  LD  1   5.4 (1358,2519)
 4   18  12  13   4    1  LD  1   6.0 (1364,2505)
 4   18  12  13   5    1  LD  1   3.2 (1365,2507)
 4   19  16  13   4    1  LD  1   6.4 (1366,2504)
 4   19  12  12   3    1  LD  1   8.8 (1366,2507)
 0   20  15  13   4    1  LD  1   6.7
511  19  14  21  10    1  WL  2  -7.9
512  19  17  19   6    1  PD  1   2.7 (SMALL POND IN MARSH)
513  20  17  23   8    1  WL  2  -1.3 (VERY WET MARSH)
514  20  16  19   9    1  WL  2  -5.3
515  18  16  24  11    1  WL  2 -10.0
516  21  16  18   8    1  WL  2  -2.5 (VERY WET MARSH)
517  19  17  21   7    1  PD  1   0.5 (VERRRY SMALL POND IN MARSH)
518  21  17  22  10    1  WL  2  -6.9
122  22  16  13   4    1  PD  1   7.4

)file,WH-NY-076,check
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LINDISC:  LA,WA,NY,MT LABELS  DATE: 08/12/80  TIME: 10:00

CLASS  LABEL(S) MAPPING TO CLASS
1      TP  RL  RM  RD  PL  PM  PD  LL  LM  LD
2      CL  BS  SD  WL  PA  BR  CO  IN  DT


coefficients
              0.315889      0.031991      0.295913     -2.76792      7.12827

*S:WH-NY-076.TEXT CHANNEL VALUES
PT#  CH1 CH2 CH3 CH4  #PX LAB CL DISCR
 99  WH-NY-076 PIXEL VALUES FOR CHANNELS: 1,2,3,4
138   18  12  15   5    1  PD  1   3.8
154   20  14  11   5    1  PD  1   3.3 (1441,2531)
154   20  16  14   5    1  PD  1   4.3 (1441,2532)
154   19  15  15   5    1  PD  1   4.2 (1442,2531)
154   24  18  17   6    1  PD  1   3.7 (1442,2532)
144   19  14  14   4    1  PD  1   6.6 (1449,2542)
144   18  14  12   4    1  PD  1   5.7 (1449,2543)
144   20  17  17   6    1  PD  1   2.4 (1450,2542)
144   19  13  13   4    1  PD  1   6.3 (1450,2543)
152   19  13  11   3    1  PD  1   8.5 (1454,2530)
152   18  13  12   3    1  PD  1   8.5 (1455,2530)
152   19  12  13   4    1  PD  1   6.3 (1456,2530)
152   17  12  13   4    1  PD  1   5.7 (1457,2531)
152   18  13  11   5    1  PD  1   2.6 (1458,2531)
152   19  13  14   3    1  PD  1   9.4 (1459,2531)
150   18  16  13   4    1  PD  1   6.1
120   25  20  13   3    1  PM  1  11.2 (1504,2537)
120   25  18  15   4    1  PM  1   9.0 (1504,2538)
120   24  17  14   4    1  PM  1   8.3 (1505,2537)
120   26  18  16   4    1  PM  1   9.6 (1505,2538)
120   26  19  15   3    1  PM  1  12.1 (1506,2537)
120   26  19  19   6    1  PM  1   5.0 (1507,2538)
116   28  22  18   4    1  PM  1  10.9
114   27  19  15   4    1  PM  1   9.6 (1514,2531)
114   28  21  17   5    1  PM  1   7.8 (1515,2531)
112   21  16  12   5    1  PD  1   4.0
 93   19  13  13   5    1  LD  1   3.6 (1520,2892)
 93   18  13  12   5    1  LD  1   2.9 (1521,2891)
 93   19  12  13   4    1  LD  1   6.3 (1522,2892)
 93   17  12  14   5    1  LD  1   3.2 (1523,2892)
 52   18  13  16   5    1  LD  1   4.1 (1598,2817)
 52   18  13  15   5    1  LD  1   3.8 (1599,2817)
 52   18  13  15   6    1  MX  0   1.1 (1600,2817)
 52   17  13  16   6    1  MX  0   1.0 (1601,2817)
 52   19  15  21   7    1  MX  0   0.4 (1602,2817)
501   30  31  35  15    1  DT  2 -13.6
502   26  28  31  11    1  DT  2  -5.0
503   27  28  30  14    1  DT  2 -13.3
504   30  29  30  14    1  DT  2 -12.3
505   30  32  34  16    1  DT  2 -16.6
511   27  26  31  13    1  PA  2 -10.3
512   28  25  29  11    1  PA  2  -5.1
513   29  27  39  16    1  PA  2 -15.6
 32   22  13  18   6    1  PD  1   3.2
 34   30  26  24  10    1  MX  0  -3.1 (1614,2617--EDGE PIXEL)
 34   29  23  18   6    1  PM  1   5.7 (1615,2618)
 34   29  23  18   6    1  PM  1   5.7 (1615,2619)
 20   21  14  18   8    1  LD  1  -2.6 *ERR* (1629,2798-- DARK LAKE)
 20   21  16  21   8    1  LD  1  -1.7 *ERR* (1628,2797-- DARK LAKE)
```

```
20   21   15   18    8     1   LD   1   -2.6 *ERR* (1628,2798-- DARK LAKE)
20   21   17   20    8     1   LD   1   -1.9 *ERR* (1629,2797-- DARK LAKE)
10   21   21   32   14     1   WL   2  -14.8 (1646,2868)
10   19   15   21    9     1   WL   2   -5.1 (1646,2869)
10   21   18   29   12     1   WL   2  -10.3 (1647,2868)
10   21   17   29   13     1   WL   2  -13.1 (1647,2869)

)file,WH-NY-085,check
```

```
LINDISC:  LA,WA,NY,MT LABELS  DATE: 08/12/80  TIME: 10:00

CLASS  LABEL(S) MAPPING TO CLASS
1      TP  RL  RM  RD  PL  PM  PD  LL  LM  LD
2      CL  BS  SD  WL  PA  BR  CO  IN  DT


coefficients
              0.315889      0.031991      0.295913     -2.76792      7.12827

*5:WH-NY-085.TEXT CHANNEL VALUES
PT#  CH1 CH2 CH3 CH4  #PX LAB CL DISCR
 -9  WH-NY-085 PIXEL VALUES FOR CHANNELS: 1,2,3,4
191   19  15  13   3    1  LD  1   9.2
200   21  14  14   4    1  LD  1   7.3
511   31  33  34  14    1  BR  2 -10.7
512   31  33  39  17    1  BR  2 -17.5
513   29  30  33  14    1  BR  2 -11.7
514   29  30  38  17    1  BR  2 -18.6
515   32  34  40  16    1  BR  2 -14.1
516   30  29  35  16    1  BR  2 -16.4
521   21  16  13   3    1  LD  1   9.8
522   21  15  12   5    1  LD  1   4.0
523   20  16  16   5    1  LD  1   4.9
524   23  14  14   5    1  LD  1   5.1
501   22  17  12   3    1  LD  1   9.9
502   20  13  11   3    1  LD  1   8.8
503   18  11  12   3    1  LD  1   8.4
504   21  13  12   3    1  LD  1   9.4
505   19  10  11   4    1  LD  1   5.6
506   19  13  11   3    1  LD  1   8.5
507   19   9  12   2    1  LD  1  11.4
156   20  22  18   6    1  LD  1   2.9
150   19  17  17   5    1  LD  1   4.9
 30   21  13  16   4    1  LD  1   7.8
102   19  13  15   4    1  LD  1   6.9 (1846,1126)
102   17  16  14   4    1  LD  1   6.1 (1847,1126)
102   21  15  15   4    1  LD  1   7.6 (1848,1126)
102   18  14  11   5    1  LD  1   2.7 (1849,1126)
 52   21  15  16   4    1  LD  1   7.9

)file,WH-NY-091,check
```

```
LINDISC:  LA,WA,NY,MT LABELS  DATE: 08/12/80  TIME: 10:00

CLASS  LABEL(S) MAPPING TO CLASS
1      TP  RL  RM  RD  PL  PM  PD  LL  LM  LD
2      CL  BS  SD  WL  PA  BR  CO  IN  DT


coefficients
              0.315889      0.031991      0.295913     -2.76792      7.12827

#T:WH-NY-091.TEXT CHANNEL VALUES
PT#  CH1 CH2 CH3 CH4  #PX LAB CL DISCR
 99  WH-NY-091 PIXEL VALUES FOR CHANNELS: 1,2,3,4
 16   19  13   8   3    1  LD  1   7.6 (2041,723)
 16   19  13  13   4    1  LD  1   6.3 (2043,723)
 16   18  12  13   3    1  LD  1   8.7 (2045,724)
 16   19  15  11   3    1  LD  1   8.6 (2046,725)
 16   18  13  11   4    1  LD  1   6.4 (2047,723)
 56   26  22  21   7    1  FD  1   2.9
 60   18  12  12   4    1  PD  1   5.7
 64   17  12  11   5    1  PD  1   2.3 (2165,899)
 64   17  11  12   4    1  PD  1   5.3 (2165,900)
 64   18  10  11   3    1  PD  1   8.1 (2166,899)
 64   18  13  12   3    1  PD  1   8.5 (2166,900)
113   32  38  37  10    1  PL  1   1.7
108   19  12  11   3    1  PD  1   8.5 (2222,915)
108   17  12  12   4    1  PD  1   5.4 (2222,916)
108   16  12  12   4    1  PD  1   5.0 (2223,915)
108   17  12  14   4    1  PD  1   6.0 (2223,916)

)file,WH-NY-094,check
```

```
LINDISC: LA,WA,NY,MT LABELS  DATE: 08/12/80  TIME: 10:00

CLASS  LABEL(S) MAPPING TO CLASS
1      TP  RL  RM  RD  PL  PM  PD  LL  LM  LD
2      CL  BS  SD  WL  PA  BR  CO  IN  DT


coefficients
              0.315889      0.031991      0.295913     -2.76792      7.12827

*F:WH-NY-094.TEXT CHANNEL VALUES
PT#  CH1 CH2 CH3 CH4  #PX LAB CL DISCR
 99  WH-NY-094 PIXEL VALUES FOR CHANNELS: 1,2,3,4
 42   17  14  15   5    1  PD  1   3.5
 28   20  18  18   6    1  PD  1   2.7
501   21  20  25  14    1  BS  2 -17.0
502   22  18  27  14    1  BS  2 -16.1
523   19  12  10   4    1  LD  1   5.4
524   21  12  11   3    1  LD  1   9.1
525   20  12  11   2    1  LD  1  11.5
526   16  11   8   3    1  LD  1   6.6
527   16  11  10   4    1  LD  1   1.4
528   19  11  10   2    1  LD  1  10.9
529   20  12  10   4    1  LD  1   5.7
530   19  12  11   3    1  LD  1   8.5
516   19  14   9   3    1  LD  1   7.9
517   21  13  12   3    1  LD  1   9.4
518   20  17  11   3    1  LD  1   8.9
519   19  13  12   4    1  LD  1   6.0
186   18  12  14   4    1  PD  1   6.3 (2115,1345)
186   18  13  14   5    1  PD  1   3.5 (2115,1346)
184   20  12  12   3    1  PD  1   9.1
284   18  12  12   3    1  PD  1   8.4
280   18  11  13   5    1  PD  1   3.2
276   17  11  12   4    1  PD  1   5.3
511   32  37  39  18    1  PA  2 -19.9
512   31  37  39  17    1  PA  2 -17.4
513   35  39  43  18    1  PA  2 -17.7
514   33  37  38  15    1  PA  2 -11.5
515   31  34  36  16    1  PA  2 -15.6
516   31  38  46  18    1  PA  2 -18.1
274   18  13  13   3    1  PD  1   8.8
506   30  37  41  16    1  DT  2 -14.4
507   32  38  40  18    1  DT  2 -19.5
508   34  38  42  18    1  DT  2 -18.3
256   20  13  13   4    1  PD  1   6.6 (2209,1177)
256   19  13  13   3    1  PD  1   9.1 (2210,1176)
256   19  14  14   4    1  PD  1   6.6 (2211,1175)
260   22  17  11   4    1  PD  1   6.8 (2217,1173)
260   22  17  15   5    1  PD  1   5.2 (2217,1174)
260   22  18  15   3    1  PD  1  10.8 (2218,1174)

)file,WH-NY-096,check
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LINDISC:  LA,WA,NY,MT LABELS  DATE: 08/12/80  TIME: 10:00

CLASS  LABEL(S) MAPPING TO CLASS
1      TP  RL  RM  RD  PL  PM  PD  LL  LM  LD
2      CL  BS  SD  WL  PA  BR  CO  IN  DT


coefficients
            0.315889      0.031991      0.295913     -2.76792      7.12827

#5:WH-NY-096.TEXT CHANNEL VALUES
PT#  CH1 CH2 CH3 CH4  #PX LAB CL DISCR
 99  WH-NY-096 PIXEL VALUES FOR CHANNELS: 1,2,3,4
501   19  12  11   3    1  LD  1   8.5
502   19  13  11   4    1  LD  1   5.7
503   23  13  12   3    1  LD  1  10.1
504   20  13  12   3    1  LD  1   9.1
505   22  15  11   3    1  LD  1   9.5
506   22  17  15   5    1  LD  1   5.2
511   33  38  44  18    1  DT  2 -18.0
512   34  38  42  17    1  DT  2 -15.5
513   29  30  41  17    1  DT  2 -17.7
514   30  37  38  16    1  DT  2 -15.3
516   24  24  28  11    1  DT  2  -6.7
517   26  28  34  15    1  BS  2 -15.2
518   30  29  37  17    1  BS  2 -18.6
519   27  25  33  14    1  BS  2 -12.5
521   21  18  21   9    1  WL  2  -4.4
522   21  17  23  10    1  WL  2  -6.6
523   22  17  29  10    1  WL  2  -4.5
524   20  18  23   8    1  WL  2  -1.3
 46   17  13  12   3    1  LD  1   8.2
527   19  11  11   3    1  LD  1   8.4
528   18  13   7   3    1  LD  1   7.0
529   18  12  11   4    1  LD  1   5.4
530   17  12   9   3    1  LD  1   7.2
531   17  12  10   4    1  LD  1   4.8
532   19  13  12   3    1  LD  1   8.8
539   18  15  17   5    1  LD  1   4.5
540   18  13  12   4    1  LD  1   5.7
541   17  12  14   3    1  LD  1   8.7
542   17  13  12   5    1  LD  1   2.6
543   18  13  14   3    1  LD  1   9.1
546   18  12  12   4    1  LD  1   5.7
547   19  13  13   3    1  LD  1   9.1
548   15  12  13   4    1  LD  1   5.0
549   18  11  12   3    1  LD  1   8.4
550   19  13  11   4    1  LD  1   5.7
551   17  13  12   4    1  LD  1   5.4
 78   17  12  15   4    1  PD  1   6.2

)file,WH-NY-100,check
```

LINDISC: LA,WA,NY,MT LABELS DATE: 08/12/80 TIME: 10:00

CLASS LABEL(S) MAPPING TO CLASS
1 TP RL RM RD PL PM PD LL LM LD
2 CL BS SD WL PA BR CO IN DT

coefficients
0.315889 0.031991 0.295913 -2.76792 7.12827

#5;WH-NY-100.TEXT CHANNEL VALUES

PT#	CH1	CH2	CH3	CH4	#PX	LAB	CL	DISCR	
99	WH-NY-100 PIXEL VALUES FOR CHANNELS: 1,2,3,4								
501	26	23	22	9	1	BS	2	-2.3	(QUARRY)
502	31	30	34	14	1	BS	2	-10.8	
503	30	28	31	10	1	BS	2	-1.0	(QUARRY)
504	26	26	25	11	1	BS	2	-6.9	
505	28	26	27	11	1	BS	2	-5.7	
506	28	26	31	13	1	BS	2	-10.0	
507	37	42	44	19	1	BS	2	-19.3	
508	28	25	31	14	1	BS	2	-12.8	
511	37	43	39	16	1	BS	2	-12.6	
512	28	27	29	11	1	BS	2	-5.0	
513	28	27	31	14	1	BS	2	-12.7	
514	26	24	28	14	1	BS	2	-14.4	
46	19	14	18	5	1	PD	1	5.1	(1789,2248)
46	20	17	20	6	1	PD	1	3.3	(1789,2249)
531	32	33	39	15	1	BR	2	-11.7	
532	32	37	38	16	1	BR	2	-14.6	
533	34	38	42	18	1	BR	2	-18.3	
534	34	36	38	15	1	BR	2	-11.3	
521	19	13	9	4	1	LD	1	5.1	
522	22	13	11	2	1	LD	1	12.2	
523	20	13	10	4	1	LD	1	5.7	
524	20	13	7	2	1	LD	1	10.4	
525	21	13	11	3	1	LD	1	9.1	
526	20	13	7	3	1	LD	1	7.6	
527	22	13	11	3	1	LD	1	9.4	
528	19	14	8	3	1	LD	1	7.6	
529	21	14	13	2	1	LD	1	12.5	
24	27	23	21	8	1	PD	1	0.5	(1868,2167)
24	27	23	22	8	1	PD	1	0.8	(1868,2168)
66	22	16	17	6	1	LD	1	3.0	(1870,2224)
66	22	17	13	4	1	LD	1	7.4	(1870,2225)
551	23	17	13	4	1	RD	1	7.7	
541	34	37	38	18	1	DT	2	-19.5	
542	34	36	38	16	1	DT	2	-14.0	
543	31	34	34	13	1	DT	2	-7.9	
544	31	36	36	16	1	DT	2	-15.6	
545	30	31	39	16	1	DT	2	-15.1	
517	31	34	41	17	1	BS	2	-16.9	
518	30	32	36	15	1	BS	2	-13.2	
519	30	34	38	16	1	BS	2	-15.3	
64	23	18	17	6	1	LM	1	3.4	(1906,2240)
64	25	17	18	7	1	LM	1	1.5	(1906,2241)
80	24	19	16	4	1	LM	1	9.0	(1916,2265)
80	24	17	16	5	1	LM	1	6.1	(1916,2266)
80	25	20	17	5	1	LM	1	6.9	(1917,2267)
80	25	18	18	4	1	LM	1	9.9	(1918,2266)
83	19	13	18	5	1	LD	1	5.0	(1994,2388)
83	19	14	15	6	1	LD	1	1.4	(1995,2389)
83	16	13	19	5	1	LD	1	4.4	(2016,2263)

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 88   19  15  19   6    1  LD  1   2.6 (2016,2264)
 88   19  14  18   6    1  LD  1   2.3 (2017,2263)
 88   19  13  18   6    1  LD  1   2.3 (2018,2263)
112   18  12  14   4    1  LD  1   6.3 (2039,2284)
112   19  15  18   5    1  LD  1   5.1 (2040,2284)

)file,BL-MT-9100,check
```

LINDISC: LA,WA,NY,MT LABELS DATE: 08/12/80 TIME: 10:00

CLASS LABEL(S) MAPPING TO CLASS
1 TP RL RM RD PL PM PD LL LM LD
2 CL BS SD WL PA BR CO IN DT

coefficients
0.315889 0.031991 0.295913 -2.76792 7.12827

#5:BL-MT-9100.TEXT CHANNEL VALUES

PT#	CH1	CH2	CH3	CH4	#PX	LAB	CL	DISCR	
99	BL-MT-9100 PIXEL VALUES FOR CHANNELS: 1,2,3,4								
522	15	17	15	9	1	BS	2	-8.1	
523	16	17	17	7	1	BS	2	-1.6	
524	16	17	17	8	1	BS	2	-4.4	
525	16	16	13	8	1	BS	2	-5.6	
220	17	17	8	2	1	LM	1	9.9	
198	16	18	8	2	1	LM	1	9.6	
531	18	17	19	9	1	BS	2	-5.9	
532	18	18	17	8	1	BS	2	-3.7	
533	17	17	18	7	1	BS	2	-1.0	
534	16	17	17	8	1	BS	2	-4.4	
535	17	17	20	9	1	BS	2	-6.0	
536	18	17	17	7	1	BS	2	-1.0	
537	17	18	18	7	1	BS	2	-1.0	
538	18	18	18	7	1	BS	2	-0.7	
539	17	18	17	7	1	BS	2	-1.3	
540	18	18	21	7	1	BS	2	0.2	*ERR* (DARKER SOIL)
541	18	19	18	8	1	BS	2	-3.4	
542	18	19	18	9	1	BS	2	-6.2	
543	18	18	21	8	1	BS	2	-2.5	
544	18	19	22	9	1	BS	2	-5.0	
545	17	19	18	7	1	BS	2	-0.9	
546	18	18	17	7	1	BS	2	-1.0	
547	16	18	18	7	1	BS	2	-1.3	
184	10	6	6	2	1	LD	1	6.7	
182	19	20	5	2	1	LM	1	9.7	(796,1342)
182	19	19	11	1	1	LM	1	14.2	(797,1341)
164	17	13	6	1	1	LD	1	11.9	
551	18	18	19	8	1	BS	2	-3.1	
552	18	20	18	8	1	BS	2	-3.4	
553	17	18	18	8	1	BS	2	-3.7	
501	19	23	25	10	1	SH	0	-6.4	
502	21	23	25	10	1	SH	0	-5.8	
503	21	23	22	8	1	SH	0	-1.1	
144	18	19	13	4	1	LM	1	6.2	
150	27	33	27	7	1	LL	1	5.3	
146	17	15	4	1	1	LD	1	11.4	(863,1349)
146	16	15	6	2	1	LD	1	8.9	(863,1350)
154	17	19	12	4	1	LM	1	5.6	
521	24	34	30	7	1	LL	1	5.3	
120	21	26	21	5	1	LL	1	7.0	
66	22	22	15	5	1	LM	1	5.4	
92	25	38	26	6	1	LL	1	7.3	
84	18	19	14	4	1	LM	1	6.5	
54	21	22	15	5	1	LL	1	5.1	
100	14	15	12	3	1	LM	1	7.3	(948,1349)
100	13	10	11	4	1	LM	1	3.7	(950,1353)
100	11	9	5	2	1	LM	1	6.8	(950,1354)
506	18	20	20	8	1	BS	2	-2.8	
507	19	21	19	9	1	BS	2	-5.5	

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508   17  18  18   8    1  BS  2  -3.7
509   16  18  16   9    1  BS  2  -7.4
 60   17  20  14   4    1  LL  1   6.2 (961,1623)
 60   17  21  13   3    1  LL  1   8.7 (962,1621)
  2   25  37  38  10    1  LL  1   0.7 (SILTING LAKE)
 16   16  17  11   2    1  LL  1  10.4 (993,1541)
 16   15  13   9   2    1  LL  1   9.4 (996,1542)
 16   15  14   8   3    1  LL  1   6.4 (997,1542)
513   18  20  19   9    1  BS  2  -5.8
514   17  20  21   8    1  BS  2  -2.8
515   18  22  23  10    1  BS  2  -7.4
511   18  20  19   8    1  BS  2  -3.1
512   18  20  23   8    1  BS  2  -1.9
 18   21  23  15   4    1  LM  1   7.9

)file,BL-MT-9186,check
```

LINDISC: LA,WA,NY,MT LABELS DATE: 08/12/80 TIME: 10:00

CLASS LABEL(S) MAPPING TO CLASS
1 TP RL RM RD PL PM PD LL LM LD
2 CL BS SD WL PA BR CO IN DT

coefficients
0.315889 0.031991 0.295913 -2.76792 7.12827

#5:BL-MT-9186.TEXT CHANNEL VALUES

PT#	CH1	CH2	CH3	CH4	#PX	LAB	CL	DISCR	
99	MT-BL-9186 PIXEL VALUES FOR CHANNELS: 1,2,3,4								
531	18	18	19	9	1	BS	2	-5.9	
532	17	17	17	8	1	BS	2	-4.1	
533	16	19	20	8	1	BS	2	-3.4	
521	16	17	17	8	1	BS	2	-4.4	
522	17	19	17	8	1	BS	2	-4.0	
523	18	19	21	9	1	BS	2	-5.3	
524	16	20	19	9	1	BS	2	-6.5	
525	15	17	15	8	1	BS	2	-5.3	
526	13	17	17	8	1	BS	2	-5.3	
10	13	11	7	2	1	PD	1	8.1	(1535,1874)
10	13	10	5	2	1	PD	1	7.5	(1536,1874)
501	18	21	21	9	1	BS	2	-5.2	
502	17	20	20	9	1	BS	2	-5.9	
503	17	20	19	8	1	BS	2	-3.4	
504	19	22	21	10	1	BS	2	-7.6	
505	19	23	23	10	1	BS	2	-7.0	
511	15	17	17	7	1	BS	2	-1.9	
512	16	17	17	7	1	BS	2	-1.6	
513	16	17	23	8	1	BS	2	-2.6	
514	17	20	25	9	1	BS	2	-4.4	
515	16	16	17	8	1	BS	2	-4.4	
516	17	20	19	9	1	BS	2	-6.2	
517	16	15	17	9	1	BS	2	-7.2	
518	15	16	16	9	1	BS	2	-7.8	
519	17	18	16	9	1	BS	2	-7.1	
520	16	17	18	8	1	BS	2	-4.1	
16	26	31	20	5	1	FL	1	8.4	
2	13	12	10	3	1	PD	1	6.3	
64	17	12	8	2	1	LM	1	9.7	(1586,1729)
64	16	12	8	2	1	LM	1	9.4	(1587,1729)
64	13	12	11	3	1	LM	1	6.6	(1589,1729)
68	24	23	17	1	1	LM	1	17.7	(1590,1755)
68	24	23	13	2	1	LM	1	13.8	(1590,1756)
68	23	24	16	4	1	LM	1	8.8	(1591,1758)
76	26	28	14	4	1	LM	1	9.3	(1597,1892)
76	22	27	16	3	1	LM	1	11.4	(1598,1892)
76	27	28	16	3	1	LM	1	13.0	(1598,1893)
76	23	27	19	5	1	LM	1	7.0	(1599,1893)
78	23	27	21	5	1	LM	1	7.6	(1623,1877)
78	22	30	24	7	1	LM	1	2.8	(1624,1878)
26	12	8	2	1	1	LD	1	9.0	(1626,1494)
26	13	8	3	0	1	LD	1	12.4	(1627,1494)
26	13	8	8	2	1	LD	1	8.3	(1628,1494)
60	25	27	18	4	1	LM	1	10.1	(1642,1720)
60	22	24	15	2	1	LM	1	13.7	(1643,1720)
60	25	25	15	5	1	LM	1	6.4	(1644,1721)
60	23	24	17	5	1	LM	1	6.4	(1645,1721)
36	11	7	3	2	1	LD	1	6.2	(1661,1471)
36	10	8	4	1	1	LD	1	9.0	(1662,1471)

36	13	10	8	3	1	LD	1	5.6	(1663,1471)
42	12	7	11	4	1	LD	1	3.3	(1661,1529)
42	11	6	3	1	1	LD	1	8.9	(1661,1532)
42	13	10	12	3	1	LD	1	6.8	(1662,1529)
88	22	23	17	5	1	PM	1	6.0	
90	14	11	12	2	1	PD	1	9.9	
150	21	23	15	3	1	LM	1	10.6	
112	13	10	9	3	1	LD	1	5.9	
114	13	9	7	2	1	PD	1	8.1	
168	12	10	8	4	1	PD	1	2.5	
187	16	15	6	2	1	LD	1	8.9	(1776,1812)
187	15	14	5	2	1	LD	1	8.3	(1777,1812)
178	14	8	6	1	1	LD	1	10.8	(1780,1751)
178	12	8	5	2	1	LD	1	7.1	(1780,1752)
178	15	12	11	3	1	LD	1	7.2	(1781,1751)
178	12	7	3	1	1	LD	1	9.3	(1781,1752)
184	24	28	21	7	1	PL	1	2.4	
186	15	31	29	6	1	LL	1	4.8	(1810,1840)
186	22	33	30	7	1	LL	1	4.6	(1810,1841)
186	24	35	27	7	1	LL	1	4.4	(1811,1840)
186	22	30	27	7	1	LL	1	3.7	(1811,1841)

)file,BL-MT-9215,check

LINDISC: LA,WA,NY,MT LABELS DATE: 08/12/80 TIME: 10:00

CLASS LABEL(S) MAPPING TO CLASS
1 TP RL RM RD PL PM PD LL LM LD
2 CL BS SD WL PA BR CO IN DT

coefficients
0.315889 0.031991 0.295913 -2.76792 7.12827

#5:BL-MT-9215.TEXT CHANNEL VALUES

PT#	CH1	CH2	CH3	CH4	#PX	LAB	CL	DISCR	
99	BL-MT-9215 PIXEL VALUES FOR CHANNELS: 1,2,3,4								
4	18	17	13	3	1	PM	1	8.9	
22	10	5	3	0	1	LD	1	11.3	(1891,1701)
22	10	8	4	0	1	LD	1	11.7	(1993,1701)
516	21	22	23	10	1	BS	2	-6.4	
517	19	23	25	10	1	BS	2	-6.4	
518	24	28	26	11	1	BS	2	-7.1	
519	21	23	24	10	1	BS	2	-6.1	
519	19	22	24	10	1	BS	2	-6.7	
526	39	24	25	10	1	BS	2	-6.4	
527	19	22	24	10	1	BS	2	-6.7	
32	18	13	8	4	1	LM	1	4.5	
58	24	30	24	7	1	PL	1	3.4	
46	14	9	6	1	1	LD	1	10.8	
44	16	16	12	3	1	LD	1	7.9	
64	15	13	7	2	1	LM	1	8.8	(1939,1671)
64	16	12	5	1	1	LM	1	11.3	(1940,1670)
60	27	31	29	8	1	LL	1	3.1	
70	18	18	11	3	1	PM	1	8.3	
42	17	18	11	3	1	PD	1	8.0	
106	11	8	4	1	1	LD	1	9.3	(1995,1496)
106	12	8	6	1	1	LD	1	10.2	(1996,1500)
112	20	17	13	2	1	PM	1	12.3	
168	24	31	26	7	1	LM	1	4.0	
172	27	28	27	6	1	PM	1	7.9	(2048,1771)
172	27	30	27	6	1	PM	1	8.0	(2048,1772)
140	26	30	25	6	1	LM	1	7.1	(2065,1444)
140	24	28	21	4	1	LM	1	10.7	(2066,1444)
140	20	21	17	5	1	LM	1	5.3	(2067,1444)
140	19	16	11	3	1	LM	1	8.6	(2069,1444)
140	18	17	6	2	1	LM	1	9.6	(2070,1444)
140	21	17	10	2	1	LM	1	11.7	(2072,1444)
140	23	17	11	2	1	LM	1	12.7	(2073,1444)
156	28	36	24	4	1	PL	1	13.2	
142	26	30	20	4	1	LL	1	11.1	(2081,1404)
142	24	28	18	2	1	LL	1	15.4	(2084,1408)
142	23	29	17	3	1	LL	1	12.0	(2085,1408)
160	27	32	23	4	1	PL	1	12.4	
152	24	22	16	5	1	LM	1	6.3	(2094,1479)
152	24	24	18	6	1	LM	1	4.2	(2095,1485)
511	21	22	27	10	1	BS	2	-5.2	
512	21	22	22	10	1	BS	2	-6.7	
148	22	23	15	4	1	LL	1	8.2	(2099,1458)
148	24	23	13	2	1	LL	1	13.8	(2099,1459)
148	24	22	13	5	1	LL	1	5.4	(2100,1459)
146	26	32	23	4	1	LL	1	12.1	(2115,1410)
146	26	32	23	5	1	LL	1	9.3	(2115,1411)
146	28	31	19	3	1	LL	1	14.3	(2116,1410)
146	27	31	20	4	1	LL	1	11.5	(2116,1411)
190	26	29	20	4	1	PL	1	11.1	

```
186   21  19  12   3    1  PL  1   9.6
501   22  24  25  10    1  SH  0  -5.4
502   21  24  25  10    1  SH  0  -5.8
503   21  22  23  10    1  SH  0  -6.4
505   24  28  27  11    1  SH  0  -6.9
192   24  28  15   4    1  PL  1   9.0

tab,.05
```

LINDISC: LA,WA,NY,MT LABELS DATE: 08/12/80 TIME: 10:00

coefficients of linear discriminant function

0.315889 0.031991 0.295913 -2.76792 7.12827

DISCRIM	Class1	Class2
-2.45	2	524
-2.40	0	0
-2.35	0	0
-2.30	0	3
-2.25	0	0
-2.20	0	3
-2.15	0	0
-2.10	0	3
-2.05	0	2
-2.00	0	1
-1.95	0	2
-1.90	1	2
-1.85	0	0
-1.80	0	0
-1.75	0	0
-1.70	0	1
-1.65	1	0
-1.60	0	2
-1.55	0	1
-1.50	0	3
-1.45	2	0
-1.40	2	0
-1.35	0	2
-1.30	0	2
-1.25	0	2
-1.20	0	0
-1.15	0	1
-1.10	0	1
-1.05	0	0
-1.00	1	3
-0.95	0	4
-0.90	0	0
-0.85	0	1
-0.80	0	0
-0.75	0	0
-0.70	0	0
-0.65	0	1
-0.60	0	1
-0.55	0	0
-0.50	0	0
-0.45	0	0
-0.40	0	0
-0.35	0	0
-0.30	0	0
-0.25	0	0
-0.20	0	1
-0.15	0	0
-0.10	0	0
-0.05	0	0
0.00	0	0
0.05	0	0
0.10	1	0
0.15	0	0
0.20	0	0
0.25	0	1
0.30	0	0

0.35	0	0
0.40	1	0
0.45	1	0
0.50	2	0
0.55	0	0
0.60	0	0
0.65	0	0
0.70	2	1
0.75	4	0
0.80	1	0
0.85	0	0
0.90	1	0
0.95	0	2
1.00	1	1
1.05	1	0
1.10	0	0
1.15	0	0
1.20	1	0
1.25	0	0
1.30	1	1
1.35	1	0
1.40	1	0
1.45	0	0
1.50	1	0
1.55	0	0
1.60	0	0
1.65	1	0
1.70	2	0
1.75	1	0
1.80	1	1
1.85	1	0
1.90	0	0
1.95	1	0
2.00	1	0
2.05	0	0
2.10	1	0
2.15	0	0
2.20	0	0
2.25	1	0
2.30	2	0
2.35	0	0
2.40	3	0
2.45	656	1
TOTAL	700	574

tab.1

```
LINDISC:  LA,WA,NY,MT LABELS  DATE: 08/12/80  TIME: 10:00

coefficients of linear discriminant function
            0.315889      0.031991      0.295913     -2.76792      7.12827

DISCRIM  Class1 Class2
 -24.00       0      1
 -23.00       0      0
 -22.00       0      0
 -21.00       0      3
 -20.00       0      6
 -19.00       0     14
 -18.00       0     18
 -17.00       0     23
 -16.00       0     31
 -15.00       0     28
 -14.00       0     32
 -13.00       0     41
 -12.00       0     31
 -11.00       0     43
 -10.00       0     36
  -9.00       0     39
  -8.00       0     36
  -7.00       0     31
  -6.00       0     30
  -5.00       0     34
  -4.00       0     28
  -3.00       2     18
  -2.00       2     24
  -1.00       5     18
   0.00       3      2
   1.00      16      5
   2.00      17      1
   3.00      37      1
   4.00      43      0
   5.00      54      0
   6.00      62      0
   7.00      71      0
   8.00      87      0
   9.00      92      0
  10.00      58      0
  11.00      60      0
  12.00      38      0
  13.00      23      0
  14.00      18      0
  15.00       6      0
  16.00       3      0
  17.00       2      0
  18.00       1      0

TOTAL       700    574

exit

Command: E(dit, R(un, F(ile, C(omp, L(ink, X(ecute, A(ssem, D(ebug,? [I.5f])
```

APPENDIX F
TABULATION SOFTWARE

COUNTAB.TEXT F-2

KOMCNTAB.TEXT F-4

INITCNT.TEXT F-5

KMDCOU.TEXT F-7

KMDFIL.TEXT F-9

KMDHEA.TEXT F-12

KMDTAB.TEXT F-13

COMMENT.TEXT F-16

GETOKEN.TEXT F-17

IMIN.TEXT F-20

READFEAT.TEXT F-21

RDLINPUT.TEXT F-24

UPCHAR.TEXT F-25

```
COUNTAB:
File:    COUNTAB.TEXT        6    2-Sep-80


PROGRAM COUNTAB:      (COUNts and TABulates pixels ...)

  (HISTORY)
    (E H Schlosser      LEMSCO  28-Jul-80      Original code)
    (T G Miller         LEMSCO  29-Aug-80      Rewrite)

  (METHOD)
    (Get command and call appropriate command procedures.)

  (EXCEPTIONS)
    (Invalid command generates diagnostic.)


VAR
  Komd : string[6];

(GLOBAL Declarations)
  (*$I KOMCNTAB*)

(EXTERNAL References)
  (*$I INITCNT*)
  (*$I UPCHAR*)
  (*$I GETOKEN*)
  (*$I IMIN*)
  (*$I COMMENT*)
  (*$I RDLINPUT*)
  (*$I READFEAT*)
  (*$I KMDHEA*)
  (*$I KMDCOU*)
  (*$I KMDFIL*)
  (*$I KMDTAB*)

BEGIN
```

```
    INITCNT;
    writeln('COUNTAB');
    writeln('user input:');
    write(')');
    Komd := ' ';
    GETOKEN(komd, 3, ',' ,INPUT);
    WHILE komd()'EXI' DO
      BEGIN
        IF komd='FIL' THEN
          KMDFIL(komd)              {file}
        ELSE IF komd='HEA' THEN
          KMDHEA(komd)              {heading}
        ELSE IF komd='TAB' THEN
          KMDTAB(komd)              {tabulate}
        ELSE IF komd='COU' THEN
          KMDCOU(komd)              {counting method}
        ELSE IF komd()' ' THEN
          writeln('INVALID COMMAND --',komd);
        RDLINPUT;
        GETOKEN(komd, 3, ',' ,INPUT);
      END;

END.
```

```
COUNTAB:
File:    KOMCNTAB.TEXT       4    3-Sep-80


(MACRO KOMCNTAB)

TYPE
  pchar4    = PACKED ARRAY[1..4] OF char;
  rowdef    = ARRAY[0..20] OF integer;
  tabledef  = ARRAY[0..24] OF rowdef;
  pixelval  = ARRAY[0..9] OF integer;

VAR
  eject     : pchar4;      (page eject)
  komhea    : string[72];
  pixcount  : ARRAY[0..9] OF tabledef;
  countmth  : string[6];
```

```
COUNTAB:
File:    INITCNT.TEXT        4    3-Sep-80


PROCEDURE INITCNT;

  {HISTORY}
    {T G Miller      LEMSCO      29-Aug-80      Original code}

  {METHOD}
    {Initialize tables for output of pixel counts.}

  {EXCEPTIONS}
    {None}

  VAR
    row    : rowdef;
    table  : tabledef;
    i      : integer;

  {GLOBAL REFERENCES}
    {KOMCNTAB}

  BEGIN

    eject[1] := chr(13);          {carriage return}
    eject[2] := chr(00);          {null}
    eject[3] := chr(11);          {vertical tab}
    eject[4] := chr(00);

    komhea := ' ';
    countmth := 'NUL';          {flag for pixel counting method}

    FOR i := 0 TO 20 DO
      row[i] := 0;
    FOR i := 0 TO 24 DO
      table[i] := row;
    FOR i := 0 TO 9 DO
```

```
        pixcount[i] := table;
    END;
```

```
COUNTAB:
File:    KMDCOU.TEXT          4    2-Sep-80


PROCEDURE KMDCOU(  {KOMmand to specify method of counting}
  VAR{out/in} Komand:string); {'cou' input, ' ' output}

  {HISTORY}
    {Mary Ann Tompkins     LEMSCO    02-Sep-80      Original code}

  {METHOD}
    {Read method of counting}

  {EXCEPTIONS}
    {If counting method is neither 'ALL' or 'MAX' or missing
    complain set countmth to 'NULL' and return.}

  {GLOBAL DECLARATION}
    {KOMCNTAB}

  {EXTERNAL REFERENCES}
    {GETOKEN}

  VAR
    good         : boolean;

  BEGIN

    Komand := ' '; {one blank means command called}
    countmth := ' ';
    GETOKEN(countmth,    3,',',INPUT);

    good := false;
    IF countmth = ' ' THEN
      writeln('No counting specification')
    ELSE IF (countmth <> 'ALL') and (countmth <> 'MAX') THEN
      writeln('Bad counting specification')
    ELSE good := true;
```

```
  IF NOT GOOD THEN
    countmth := 'NUL';
END;
```

```
COUNTAB:
File:   KMDFIL.TEXT          8   3-Sep-80


  PROCEDURE KMDFIL(  {KoMmanD to set data from specified FILe}
    VAR{out/in} Komand : string); {'FIL' input, ' ' output}


    {HISTORY}
      {Mary Ann Tompkins          LEMSCO  25-Apr-80       Original code - CPLOT}
      {E H Schlosser              LEMSCO  29-Jul-80       Rewrite - WLDISC}
      {Mary Ann Tompkins          LEMSCO  28-Aug-80       Rewrite - COUNTAB}

    {METHOD}
      {Read method of counting of pixels and file name. Check length
      of file name. Prefix volume number (*5:), append 'TEXT' to
      file name and attempt to open file; get feature number,acrage,
      and count of pixels per pixel value for feature from file records.
      store pixel count in data arrays for appropriate acerage range.}

    {EXCEPTIONS}
      {1. If file name is missing or length of file name > 10, complain and
          return.}
      {2. If there is an iostatus error on opening file, complain and return.}

    {GLOBAL DECLARATION}
      {KOMCNTAB}

    {EXTERNAL REFERENCES}
      {GETOKEN}
      {READFEAT}


    VAR
      ok         : boolean;
      good       : boolean;
      diskfid    : interactive;
      diskname   : string[20];
```

```
  iostatus  : integer; {ioresult on open}
  cntmth    : string[6]; {method of pixel counting}
  pixels    : pixelval; {pixel count for feature}
  acres     : real;  {acerage of feature}
  featnum   : real;  {feature #}
  pixtotal  : integer; {count of pixel within a range}
  i,J       : integer; {do INDEX for array index}


BEGIN

  komand := ' '; {one blank means command called}
  cntmth := countmth;
  diskname := ' ';
  GETOKEN(diskname,  13,',',INPUT);


  ok := false;
  IF diskname=' ' THEN
    writeln('no file name')
  ELSE IF length(diskname)>10 THEN
    writeln('file name ',diskname,' too long')
  ELSE ok := true;

  good := true;
  IF cntmth = 'NUL' THEN
    BEGIN
      writeln('counting method not specified');
      good := false;
    END;

  IF (ok) and (good) THEN
    BEGIN {attempt to open disk file on unit #5}
      INSERT('#5:',diskname,1);
      INSERT(',TEXT',diskname,(length(diskname)+1));
      {$I-} {operating system won't check I/O status}
        RESET(diskfid,diskname);
        iostatus := IORESULT;
      {$I+} {operating system resumes checking I/O status}
      ok := (iostatus = 0);
```

```
      IF NOT ok THEN
        BEGIN
          writeln('ERROR ',iostatus,' OPENING ',diskname);
        END;
    END;

  IF (ok) and (good) THEN
    BEGIN

      WHILE NOT eof(diskfid) DO
        BEGIN (read fields from disk records, save in arrays)

          READFEAT(featnum,acres,pixels,   diskfid,cntmth);
          IF featnum )= 500.0 THEN
            acres := 0.0;
           FOR i := 0 to 9 DO
             BEGIN
               pixtotal := 0;
               FOR J := 0 to i DO
                 pixtotal := pixtotal + pixels[J];
               pixcount[i,imin(trunc(acres),24),imin(pixtotal,20)] :=
               imin((pixcount[i,imin(trunc(acres),24),imin(pixtotal,20)]
               + 1),999);
             END;

        END;

      CLOSE(diskfid);
      writeln;

    END;
END;
```

```
COUNTAB:
File:    KMDHEA.TEXT          4  29-Jul-80


  PROCEDURE KMDHEA(  {KoMmanD to set HEAding}
    VAR{out/in} komand : string); {'HEA' input, ' ' output}


    {HISTORY}
      {J C Crisp          LEMSCO  25-Jul-80        Original code}
      {E H Schlosser      LEMSCO  29-Jul-80        Getoken & string heading}

    {METHOD}
      {Read heading text from input file and store as string.}

    {GLOBAL DECLARATIONS}
      {KOMLDIS}

    {EXTERNAL REFERENCES}
      {GETOKEN}

    BEGIN
      komand := ' '; {one blank means command called}
      GETOKEN(komhea,    72,'!',INPUT);
    END;
```

```
COUNTAB:
File:    KMDTAB.TEXT          8    3-Sep-80


PROCEDURE KMDTAB(      (KOMmand to TABulate pixel totals from COUINTAB)
  VAR(in/out) komand : string);      ('TAB' input, ' ' output)

  (HISTORY)
    (T G Miller      LEMSCO      28-Aug-80      Original code)

  (METHOD)
    (Computes percent of features with 0 pixels and 1 pixel for each
     acrease division.  Totals features for each division and for all
     numbers of pixels.  Computes percentages for totals.  Writes pixel
     count map, percentages, and totals for the ten pixel value ranges.)

  (EXCEPTIONS)
    (None)

  (GLOBAL DECLARATION)
    (KOMCNTAB)

  (EXTERNAL REFERENCES)
    (None)

VAR
  iplane    : integer;          (                                    )
  iacre     : integer;          ( pixcount[iplane,iacre,ifeat] )
  ifeat     : integer;          (                                    )
  init      : integer;          (counter)
  printer   : text;
  coltot    : rowdef;           (Total no. of features by number of pixels)
  itot      : integer;          (Total no. of features per row)
  total     : integer;          (Total no. of features)

PROCEDURE CNTABHED;

  BEGIN
```

```
    writeln(printer,eject,'COUNTAB:  ',komhea);
    writeln(printer);
    IF countmth='ALL' THEN
      writeln(printer,' Count of features by acres & total number of pixels.')
    ELSE writeln(printer,
      ' Count of features',
      ' by acres of water & maximum number of contiguous pixels.');
    writeln(printer);
    writeln(printer,' Table For Pixel value(s)  0  through  ',iplane);
    writeln(printer);
    writeln(printer,
      'Water                          ',
      'Number of Pixels per Feature                        %   %');
    write(printer,'Acres');
    FOR init := 0 TO 20 DO
      write(printer,init:3);
    writeln(printer,'+ TOT  0   1');
    FOR init := 1 TO 80 DO
      write(printer,'-');
    writeln(printer);

  END;

{KMDTAB}

BEGIN

  rewrite(printer,'printer:');
  komand := ' ';
  FOR iplane := 0 TO 9 DO
    BEGIN
      CNTABHED;
      FOR init := 0 TO 20 DO
        coltot[init] := 0;
      total := 0;
      FOR iacre := 0 TO 24 DO
        BEGIN
          writeln(printer,iacre:2,' -!');
          IF iacre=24 THEN
```

```
            write(printer,'999 !')
          ELSE write(printer,iacre:2,'.9!');
          itot := 0;
          FOR ifeat := 0 TO 20 DO
            BEGIN
              itot := itot+pixcount[iplane,iacre,ifeat];
              write(printer,pixcount[iplane,iacre,ifeat]:3);
            END;
          IF itot<>0 THEN
          writeln(printer,itot:4,round((pixcount[iplane,iacre,0]/itot)*100.0):4,
            round((pixcount[iplane,iacre,1]/itot)*100.0):4)
          ELSE writeln(printer,itot:4,'  --  --');
          FOR init := 0 TO 20 DO
            coltot[init] := coltot[init]+pixcount[iplane,iacre,init];
          total := total+itot;
        END;
      FOR init := 1 TO 80 DO
        write(printer,'-');
      writeln(printer);
      write(printer,'Total');
        FOR init := 0 TO 20 DO
          write(printer,coltot[init]:3);
        IF total<>0 THEN
          writeln(printer,total:4,round((coltot[0]/total)*100.0):4,
            round((coltot[1]/total)*100.0):4)
        ELSE writeln(printer,total:4,'  --  --');
    END;
  writeln(printer,eject);
  CLOSE(printer);

END;
```

```
COUNTAB:
File:    COMMENT.TEXT        4    3-Sep-80


PROCEDURE COMMENT(  (Handle all line comments within data)
  VAR(in) Filename: interactive); (filename of file)

  (HISTORY)
    (Mary Ann Tompkins          LEMSCO  28-Aug-80        Original code)

  (METHOD)
    (This routine is called only when the character (*) which signifies
    a comment has been read. The comment line and following if any,
    comments lines are read and displayed on the CRT.)

  VAR
    character : char; (one character)
    charstring : string[72]; (character string)

  BEGIN
    character := '*';
    WHILE character = '*' DO
      BEGIN
        readln(filename,charstring);
        writeln(charstring);
        read(filename,character);
      END;
  END;
```

```
COUNTAB:
File:   GETOKEN.TEXT        8  29-Jul-80


  PROCEDURE GETOKEN(  {GET string TOKEN from specified open file}
    VAR{out} token   : string; {character string token}
    {=}
       {in}  lentok  : integer; {truncate token to this length if longer}
       {in}  delim   : char; {delimiter character after token}
    VAR{in}  fileid  : interactive); {one of the following:
                                          INPUT    -- system terminal with echo
                                          KEYBOARD -- system terminal w/o echo
                                          {other}  -- open disk file}


    {HISTORY}
      {Mary Ann Tompkins  LEMSCO  27-Mar-80       Original code}
      {E H Schlosser      LEMSCO  29-Jul-80       New delim & fileid args}

    {METHOD}
      {THIS PROCEDURE GETS ALL FREE-FORMAT DATA FIELDS.}

       {FREE-FORMAT INPUT RULES}
          {1. LINES -- AN INPUT LINE CONTAINS UP TO 80 CHARACTERS
              TERMINATED BY A CARRIAGE RETURN.}
          {2. DELIMITER -- ENDS DATA FIELD (NEXT DATA FIELD FOLLOWS)}
          {3. FIELDS -- EACH DATA FIELD IS COMPOSED OF A SIGNFICANT AND
              A NON-SIGNIFICANT PART. THE SIGNIFICANT PART IS DETERMINED
              BY A SPECIFIED MAXIMUM length.  ALL leading and trailing
              BLANKS AND NON-SIGNIFICANT PARTS ARE IGNORED, unless the
              field is composed entirely of blanks, in which case a
              single blank is returned in token.}

    {EXCEPTIONS}
      {If there are no characters left in the current line when GETOKEN is
      called THEN token is unchanged.}
      {Backspace key (ASCII CTRL-H) works properly.}
```

```
VAR
  character : char; {1 character}
  locend    : integer; {location in token of current last char}
  newend    : integer; {new location of last char}
  string1   : string[1]; {string of 1 character}
  backspace : char;

{EXTERNAL REFERENCES}
  {UPCHAR}  {convert lowercase letters to UPpercase CHARacters}

BEGIN
  IF NOT eoln(fileid) THEN
    BEGIN
      backspace := chr(8); {ASCII BS}
      token := ''; {initialize to null string}
      locend := 0;
      string1 := '?'; {so it has a logical length of one}

      {Get first non-blank character}
      character := ' ';
      WHILE (character=' ') AND (NOT eoln(fileid)) DO
        read(fileid,character);

      {Get & append characters until delimiter or end of line}
      WHILE (character()delim) AND (NOT eoln(fileid)) DO
        BEGIN
          IF character=backspace THEN
            BEGIN {delete previous character}
              IF locend)0 THEN
                BEGIN
                  DELETE(token,locend,1);
                  locend := locend-1;
                END;
            END
          ELSE IF locend(lentok THEN
            BEGIN {append character to token}
              string1[1] := UPCHAR(character);
              locend := locend+1;
              INSERT(string1,token,locend);
            END;
```

```
            read(fileid,character);
          END;

        IF locend=0
          THEN token := ' ' {pad null token with one blank}
        ELSE
          BEGIN {remove trailing blanks from tokens longer than 1}
            newend := locend;
            WHILE (newend>1) AND (token[newend]=' ') DO
              newend := newend-1;
            IF newend<>locend THEN
              DELETE(token,newend+1,locend-newend);
          END;

      END;
  END;
```

```
COUNTAB:
File:    IMIN.TEXT          4  13-May-80


  FUNCTION IMIN(i,J:integer):integer;  {Integer MINimum of 2 integers}

    {HISTORY}
      {E H Schlosser     LEMSCO  13-May-80        Original code}

    BEGIN
      IF i<J THEN IMIN := i
      ELSE IMIN := J;
    END;
```

```
COUNTAB:
File:    READFEAT.TEXT        6    3-Sep-80


PROCEDURE READFEAT(  {READ FEATURE #,acres count of pixels from record}
  VAR{out} featnum : real;
  VAR{out} acres   : real;
  VAR{out} totpixct : pixelval {depending on method of counting total
                                pixel count}
  {=}
  VAR{in} fileid   : interactive; {fileid of file}
  VAR{in} cntmth   : string); {counting method}

  {HISTORY}
    {Mary Ann Tompkins          LEMSCO  28-Aug-80       Original code}

  {METHOD}
    {Read first character of line. If * call COMMENT. Else assume position
    is at beginning of feature record. Process data according to counting
    method until '/' is read.}

  {EXCEPTIONS}
    {line comments denoted by character * in first column can be located
    anywhere within a file as long as they DO NOT separate a feature
    record from its pixel record.}

  {GLOBAL DECLARATION}
    {KOMCNTAB}

  {EXTERNAL REFERENCES}
    {COMMENT}

  VAR
    ch     : char;
    value : integer;
    totalval : array[1..2] of integer; {total # pixels in a data line}
    pixcnt   :  array[1..2] of pixelval; {pixel count}
```

```
BEGIN
  featnum := 0.0;
  acres := 0.0;
  totalval[1] := 0;
  FOR value := 0 to 9 DO
    pixcnt[1,value] := 0;

      read(fileid,ch);
      IF ch = '*' THEN
        comment(fileid);
  IF NOT eof(fileid) THEN
    BEGIN
      readln(fileid,featnum,acres); {feature record}
      read(fileid,ch);

      If ch = ' ' THEN {pixel record}
        BEGIN
          REPEAT
            readln(fileid,pixcnt[2,0],pixcnt[2,1],pixcnt[2,2],
                   pixcnt[2,3],pixcnt[2,4],pixcnt[2,5],pixcnt[2,6],
                   pixcnt[2,7],pixcnt[2,8],pixcnt[2,9]);
            If cntmth () 'ALL' THEN
              BEGIN
                totalval[2] := 0;
                FOR value := 0 to 9 DO
                  totalval[2] := pixcnt[2,value] + totalval[2];

                IF totalval[2] ) totalval[1] THEN
                  BEGIN
                    pixcnt[1] := pixcnt[2];
                    totalval[1] := totalval[2];
                  END
              END
            ELSE
              FOR value := 0 to 9 DO
                pixcnt[1,value] := pixcnt[1,value] + pixcnt[2,value];
            read(fileid,ch);
          UNTIL (ch = '/') or (ch = '*');
```

```
            IF ch = '*' THEN
              comment(fileid);
          END;{ch() '/'}
      END;{not eof}
      totpixct := pixcnt[1];
END;
```

```
COUNTAB:
File:    RDLINPUT.TEXT      4  29-Jul-80


  PROCEDURE RDLINPUT;  {ReaDLn from INPUT console & write prompt char}

  {HISTORY}
    {MARY ANN TOMPKINS  LEMSCO   04/03/80   ORIGINAL CODE}

  {METHOD}
    {POSITIONS TO A BEGINNING OF NEW INPUT LINE}

  BEGIN
    READLN;
    WRITE(')');
  END;
```

```
COUNTAB:
File:    UPCHAR.TEXT          4    8-May-80


  FUNCTION UPCHAR(byte:char):char;

    {HISTORY}
      {E H Schlosser     LEMSCO  4-Apr-80         Orisinal code}

    {METHOD}
      {Convert all lowercase letters to uppercase.}

    BEGIN
      IF (byte('a') OR (byte)'z')
        THEN UPCHAR := byte
        ELSE UPCHAR := chr(ord(byte)-32);
    END;
```

APPENDIX C
TABULATION DATA

SYMBOLS AND BIASES FOR SHIFTED DISCRIMINANTS C-2

SAMPLE INPUT DATA FILE C-3

COMMAND FILE C-4

TABULATIONS C-5

SHIFTED DISCRIMINANT

SYMBOLS	BIAS TERM
0 to 0	6.728
0 to 1	6.928
0 to 2	7.128 *
0 to 3	7.328
0 to 4	7.528
0 to 5	7.728
0 to 6	7.928
0 to 7	8.128
0 to 8	8.328
0 to 9	8.528

* Bias term from weighted linear discriminant fit

```
*5:RD-NY-070.TEXT      6  11-Sep-80

* COUNT OF LEVELS 0 THRU 9 FOR NY-070
/   4       21.2
    0   0    0   0   0   1   0   0   0   0
    2   0    0   1   0   0   0   0   0   0
    2   0    0   0   0   0   0   0   0   0
/  19       19.2
    6   0    0   2   0   0   1   0   0   1
/ 401      999.0
   99   0    0   0   0   0   0   0   0   0
/  70       37.5
   20   0    0   0   1   0   0   0   1   0
/  94        6.8
    2   0    0   0   0   0   0   0   0   0
/  88.1     10.8
    2   0    0   0   0   0   0   0   0   0
/  88.2    103.2
   99   0    0   0   0   0   0   0   0   0
/  86       10.3
    3   0    1   0   0   0   0   0   0   0
/  76        4.5
    0   0    0   0   0   0   1   0   0   0
/  74      197.7
   99   0    0   0   0   0   0   0   0   0
/  78        6.2
    2   0    0   1   0   1   0   0   0   0
/  80.1      2.7
    2   0    0   0   0   0   0   0   0   0
/  80.2     28.8
   15   1    0   1   0   0   0   1   0   0
/  84      111.0
   99   0    0   0   0   0   0   0   0   0
/  82        5.4
    1   0    0   0   0   0   0   0   0   1
/ 124        2.3
    2   0    0   0   0   0   0   0   0   1
/ 126        1.0 ACTUAL ACRES : 0.7
    1   0    0   0   0   0   0   0   0   0
/ 122        9.6
    1   0    0   1   0   0   0   0   0   0
/ 118        5.3
    1   0    0   0   0   0   0   0   0   0
/  21        4.3
/  50        4.7
/  54        5.1
/  60       10.6
/  62        2.9
/  66        2.0
/  68        6.6
/  92        4.7
/  96        3.5
/  98        2.9
/ 120        7.8
RED:RD-NY-070.TEXT transferred to PRINTER:


File: G(et, S(ave, W(hat, N(ew, L(dir, R(em, C(hng, T(rans, D(ate, Q(uit [F.S]
```

```
RED:
File:    RED-ALL.CMD          4   12-Sep-80


(RED-LA,WA,NY,MT)
%+
X COUNTAB
  hea,RED LA, WA, NY & MT Frames       Date: %=   Time: %=
  count,%"(all or max) ) "%=
  file,RD-LA-9734
  file,RD-LA-9749
  file,RD-LA-9723
  file,RD-LA-9691
  file,RD-WA-1440
  file,RD-WA-1448
  file,RD-WA-1468
  file,RD-WA-1484
  file,RD-WA-1490
  file,RD-WA-1511
  file,RD-WA-1513
  file,RD-WA-1535
  file,RD-WA-1582
  file,RD-NY-059
  file,RD-NY-062
  file,RD-NY-070
  file,RD-NY-076
  file,RD-NY-085
  file,RD-NY-091
  file,RD-NY-094
  file,RD-NY-096
  file,RD-NY-098
  file,RD-NY-100
  file,RD-NY-102
  file,RD-NY-105
  file,RD-MT-9100
  file,RD-MT-9186
  file,RD-MT-9215
%-
  tab
```

COUNTAB: RED LA, WA, NY & MT FRAMES DATE: 17-SEP-80 TIME: 15:00

Count of features by acres & total number of pixels.

Table For Pixel value(s) 0 through 0

Water Acres	Number of Pixels per Feature																						%	%
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20+	TOT	0	1
0 -|																								
0.9|	63	22	2	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	91	69	24
1 -|																								
1.9|	29	12	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	42	69	29
2 -|																								
2.9|	302	18	5	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	326	93	6
3 -|																								
3.9|	147	27	11	1	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	188	78	14
4 -|																								
4.9|	101	25	12	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	143	71	17
5 -|																								
5.9|	60	26	16	6	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	109	55	24
6 -|																								
6.9|	26	13	11	5	4	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	64	41	20
7 -|																								
7.9|	28	7	12	3	4	1	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	57	49	12
8 -|																								
8.9|	11	16	6	6	7	4	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	52	21	31
9 -|																								
9.9|	9	9	2	3	4	7	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	38	24	24
10 -|																								
10.9|	10	4	3	5	11	5	4	2	2	0	0	0	0	0	0	0	0	0	0	0	0	46	22	9
11 -|																								
11.9|	5	5	1	5	3	1	2	0	0	1	1	1	0	0	0	0	0	0	0	0	0	25	20	20
12 -|																								
12.9|	5	7	3	2	2	5	3	0	1	0	0	0	0	0	0	0	0	0	0	0	0	28	18	25
13 -|																								
13.9|	1	1	3	3	3	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	14	7	7
14 -|																								
14.9|	2	3	2	3	3	2	0	1	2	3	1	0	0	1	0	0	0	0	0	0	0	23	9	13
15 -|																								
15.9|	1	1	1	1	2	2	1	0	2	2	1	0	1	0	0	0	0	0	0	0	0	15	7	7
16 -|																								
16.9|	2	1	2	1	1	0	2	0	2	2	0	0	0	0	0	0	0	0	0	0	0	13	15	8
17 -|																								
17.9|	3	1	0	0	2	1	3	0	3	1	0	0	0	1	1	0	0	0	0	0	0	16	19	6
18 -|																								
18.9|	0	1	0	1	1	0	3	1	0	1	0	2	1	1	0	0	0	0	0	0	0	12	0	8
19 -|																								
19.9|	1	0	0	0	0	2	2	1	2	1	0	1	1	0	0	0	0	0	0	0	0	11	9	0
20 -|																								
20.9|	1	0	0	0	2	1	0	1	0	2	1	0	0	0	0	0	0	0	0	0	0	8	13	0
21 -|																								
21.9|	0	0	0	0	3	1	1	1	1	1	1	0	1	0	0	0	0	1	0	0	0	11	0	0
22 -|																								
22.9|	0	0	0	0	1	0	0	3	1	1	0	2	2	0	0	0	0	0	0	0	0	10	0	0
23 -|																								
23.9|	0	0	0	1	0	1	1	0	1	0	0	1	0	1	1	0	1	0	0	0	0	8	0	0
24 -|																								
999 |	5	1	2	0	1	3	3	1	2	4	9	2	2	3	6	5	7	3	5	3107		174	3	1
Total	812	200	95	54	55	42	35	12	20	21	14	9	8	7	8	5	8	4	5	3107	1524		53	13

COUNTAB: RED LA, WA, NY & MT FRAMES DATE: 17-SEP-80 TIME: 15:00

Count of features by acres & total number of Pixels.

Table For Pixel value(s) 0 through 1

Water Acres	Number of Pixels per Feature																						%	%
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20+	TOT	0	1
0 -1																								
0.9	56	28	2	2	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	91	62	31
1 -1																								
1.9	28	13	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	42	67	31
2 -2																								
2.9	301	19	5	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	326	92	6
3 -3																								
3.9	146	27	12	1	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	188	78	14
4 -4																								
4.9	101	25	12	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	143	71	17
5 -5																								
5.9	60	25	17	6	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	109	55	23
6 -6																								
6.9	26	12	12	5	4	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	64	41	19
7 -7																								
7.9	28	6	13	3	3	2	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	57	49	11
8 -8																								
8.9	11	16	6	4	8	5	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	52	21	31
9 -9																								
9.9	9	9	2	3	4	7	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	38	24	24
10 -10																								
10.9	10	4	3	5	11	5	3	3	2	0	0	0	0	0	0	0	0	0	0	0	0	46	22	9
11 -11																								
11.9	5	5	1	4	4	1	2	0	0	1	1	1	0	0	0	0	0	0	0	0	0	25	20	20
12 -12																								
12.9	5	6	4	1	2	6	3	0	1	0	0	0	0	0	0	0	0	0	0	0	0	28	18	21
13 -13																								
13.9	1	1	3	3	3	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	14	7	7
14 -14																								
14.9	2	3	2	3	2	3	0	1	2	3	1	0	0	1	0	0	0	0	0	0	0	23	9	13
15 -15																								
15.9	1	1	1	0	3	1	2	0	1	3	1	0	0	1	0	0	0	0	0	0	0	15	7	7
16 -16																								
16.9	2	1	1	2	1	0	2	0	1	1	2	0	0	0	0	0	0	0	0	0	0	13	15	8
17 -17																								
17.9	3	1	0	0	2	1	3	0	2	1	1	0	0	1	1	0	0	0	0	0	0	16	19	6
18 -18																								
18.9	0	1	0	1	1	0	3	1	0	1	0	2	1	1	0	0	0	0	0	0	0	12	0	8
19 -19																								
19.9	1	0	0	0	0	2	1	2	1	2	0	0	2	0	0	0	0	0	0	0	0	11	9	0
20 -20																								
20.9	1	0	0	0	2	1	0	1	0	2	1	0	0	0	0	0	0	0	0	0	0	8	13	0
21 -21																								
21.9	0	0	0	0	2	2	1	1	1	0	2	0	1	0	0	0	0	1	0	0	0	11	0	0
22 -22																								
22.9	0	0	0	0	1	0	0	3	1	1	0	2	1	1	0	0	0	0	0	0	0	10	0	0
23 -23																								
23.9	0	0	0	0	1	1	0	0	2	0	0	0	1	0	2	0	1	0	0	0	0	8	0	0
24 -24																								
999	5	0	3	0	1	3	2	2	2	2	9	3	2	3	5	4	7	5	6	1109		174	3	0
Total	802	203	100	49	57	46	30	17	17	19	18	8	8	8	8	4	8	6	6	1109	1524		53	13

COUNTAB: RED LA, WA, NY & MT FRAMES DATE: 17-SEP-80 TIME: 15:00

Count of features by acres & total number of pixels.

Table For Pixel value(s) 0 through 2

Water Acres	Number of Pixels per Feature																						%	%
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20+	TOT	0	1
0 -1																								
0.9	55	28	3	2	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	91	60	31
1 -1																								
1.9	28	13	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	42	67	31
2 -1																								
2.9	297	21	5	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	326	92	6
3 -1																								
3.9	145	26	14	1	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	188	77	14
4 -1																								
4.9	98	26	14	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	143	69	18
5 -1																								
5.9	60	23	19	5	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	109	55	21
6 -1																								
6.9	26	9	14	5	5	3	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	64	41	14
7 -1																								
7.9	28	6	13	3	3	2	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	57	49	11
8 -1																								
8.9	11	16	5	5	8	5	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	52	21	31
9 -1																								
9.9	9	9	1	4	4	5	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	38	24	24
10 -1																								
10.9	10	4	3	4	11	6	3	2	3	0	0	0	0	0	0	0	0	0	0	0	0	46	22	9
11 -1																								
11.9	5	5	1	4	4	1	2	0	0	1	0	2	0	0	0	0	0	0	0	0	0	25	20	20
12 -1																								
12.9	5	6	3	2	1	7	3	0	1	0	0	0	0	0	0	0	0	0	0	0	0	28	18	21
13 -1																								
13.9	1	1	3	3	3	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	14	7	7
14 -1																								
14.9	2	1	4	3	2	3	0	1	2	2	2	0	0	1	0	0	0	0	0	0	0	23	9	4
15 -1																								
15.9	1	1	1	0	3	1	2	0	1	3	1	0	0	1	0	0	0	0	0	0	0	15	7	7
16 -1																								
16.9	2	1	1	2	1	0	2	0	1	1	2	0	0	0	0	0	0	0	0	0	0	13	15	8
17 -1																								
17.9	3	0	1	0	2	0	3	1	2	1	1	0	0	1	1	0	0	0	0	0	0	16	19	0
18 -1																								
18.9	0	1	0	0	2	0	3	1	0	1	0	2	1	1	0	0	0	0	0	0	0	12	0	8
19 -1																								
19.9	1	0	0	0	0	2	1	2	1	2	0	0	2	0	0	0	0	0	0	0	0	11	9	0
20 -1																								
20.9	1	0	0	0	1	2	0	1	0	2	1	0	0	0	0	0	0	0	0	0	0	8	13	0
21 -1																								
21.9	0	0	0	0	2	2	1	1	1	0	2	0	0	1	0	0	0	1	0	0	0	11	0	0
22 -1																								
22.9	0	0	0	0	1	0	0	2	2	0	1	2	1	0	1	0	0	0	0	0	0	10	0	0
23 -1																								
23.9	0	0	0	0	1	1	0	0	1	1	0	0	0	1	1	1	0	0	1	0	0	8	0	0
24 -1																								
999	5	0	3	0	1	3	1	2	1	3	10	2	3	3	5	4	7	5	4	3109	174	3	0	
Total	795	197	109	49	58	45	31	17	17	19	20	8	7	9	8	5	7	6	5	3109	1524	52	13	

COUNTAB: RED LA, WA, NY & MT FRAMES DATE: 17-SEP-80 TIME: 15:00

Count of features by acres & total number of pixels.

Table For Pixel value(s) 0 through 3

Water Acres	Number of Pixels per Feature																						%	%
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20+	TOT	0	1
0 -1																								
0.9	53	30	3	2	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	91	58	33
1 -2																								
1.9	26	15	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	42	62	36
2 -3																								
2.9	297	22	6	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	326	91	7
3 -4																								
3.9	145	24	15	2	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	188	77	13
4 -5																								
4.9	95	27	14	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	143	66	19
5 -6																								
5.9	58	23	21	5	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	109	53	21
6 -7																								
6.9	24	10	12	8	5	3	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	64	38	16
7 -8																								
7.9	27	7	13	3	3	2	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	57	47	12
8 -9																								
8.9	11	15	6	5	8	5	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	52	21	29
9 -10																								
9.9	9	8	2	4	4	5	3	2	1	0	0	0	0	0	0	0	0	0	0	0	0	38	24	21
10 -11																								
10.9	10	3	3	5	8	8	3	2	4	0	0	0	0	0	0	0	0	0	0	0	0	46	22	7
11 -12																								
11.9	5	5	0	5	4	1	2	0	0	1	0	2	0	0	0	0	0	0	0	0	0	25	20	20
12 -13																								
12.9	5	4	4	1	2	7	2	2	1	0	0	0	0	0	0	0	0	0	0	0	0	28	18	14
13 -14																								
13.9	1	1	2	4	3	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	14	7	7
14 -15																								
14.9	2	1	3	4	2	3	0	1	2	1	2	1	0	1	0	0	0	0	0	0	0	23	9	4
15 -16																								
15.9	1	1	1	0	2	2	2	0	0	4	1	0	0	1	0	0	0	0	0	0	0	15	7	7
16 -17																								
16.9	2	1	1	2	1	0	2	0	1	1	2	0	0	0	0	0	0	0	0	0	0	13	15	8
17 -18																								
17.9	3	0	1	0	1	1	3	0	3	1	1	0	0	1	1	0	0	0	0	0	0	16	19	0
18 -19																								
18.9	0	1	0	0	2	0	3	1	0	1	0	1	2	1	0	0	0	0	0	0	0	12	0	8
19 -20																								
19.9	1	0	0	0	0	1	1	1	2	3	0	0	2	0	0	0	0	0	0	0	0	11	9	0
20 -21																								
20.9	1	0	0	0	0	3	0	1	0	2	1	0	0	0	0	0	0	0	0	0	0	8	13	0
21 -22																								
21.9	0	0	0	0	1	3	0	2	1	0	2	0	0	1	0	0	0	1	0	0	0	11	0	0
22 -23																								
22.9	0	0	0	0	1	0	0	2	2	0	1	1	2	0	1	0	0	0	0	0	0	10	0	0
23 -24																								
23.9	0	0	0	0	1	1	0	0	1	1	0	0	0	1	1	1	0	0	1	0	0	8	0	0
24 -999																								
999	5	0	2	0	1	3	0	1	3	1	9	5	3	2	4	5	7	4	3	4	111	174	3	0
Total	781	198	111	58	52	49	29	16	22	18	19	10	9	8	7	6	7	5	4	4	1111	1524	51	13

COUNTAB: RED LA, WA, NY & MT FRAMES DATE: 17-SEP-80 TIME: 15:00

Count of features by acres & total number of pixels.

Table For Pixel value(s) 0 through 4

Water Acres	Number of Pixels per Feature																					%	%
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20+	TOT	0	1
0 -1																								
0.9	46	34	6	2	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	91	51	37
1 -1																								
1.9	25	16	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	42	60	38
2 -2																								
2.9	293	26	6	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	326	90	8
3 -3																								
3.9	145	23	15	3	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	188	77	12
4 -4																								
4.9	94	27	12	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	143	66	19
5 -5																								
5.9	57	23	22	4	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	109	52	21
6 -6																								
6.9	23	11	11	9	5	3	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	64	36	17
7 -7																								
7.9	27	7	10	5	2	3	2	0	0	1	0	0	0	0	0	0	0	0	0	0	0	57	47	12
8 -8																								
8.9	10	16	5	6	8	3	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	52	19	31
9 -9																								
9.9	8	9	2	4	3	4	5	1	2	0	0	0	0	0	0	0	0	0	0	0	0	38	21	24
10 -10																								
10.9	10	3	3	4	9	8	3	2	3	0	1	0	0	0	0	0	0	0	0	0	0	46	22	7
11 -11																								
11.9	5	5	0	5	2	2	2	1	0	0	1	2	0	0	0	0	0	0	0	0	0	25	20	20
12 -12																								
12.9	5	4	4	1	2	7	2	1	1	1	0	0	0	0	0	0	0	0	0	0	0	28	18	14
13 -13																								
13.9	1	1	2	3	2	3	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	14	7	7
14 -14																								
14.9	2	1	2	4	3	3	0	0	3	1	1	2	0	1	0	0	0	0	0	0	0	23	9	4
15 -15																								
15.9	0	2	1	0	1	3	1	1	0	4	1	0	0	1	0	0	0	0	0	0	0	15	0	13
16 -16																								
16.9	2	1	1	2	1	0	2	0	1	1	2	0	0	0	0	0	0	0	0	0	0	13	15	8
17 -17																								
17.9	3	0	1	0	0	2	3	0	3	1	1	0	0	0	2	0	0	0	0	0	0	16	19	0
18 -18																								
18.9	0	1	0	0	2	0	3	0	1	1	0	1	2	1	0	0	0	0	0	0	0	12	0	8
19 -19																								
19.9	1	0	0	0	0	1	1	0	3	2	1	0	2	0	0	0	0	0	0	0	0	11	9	0
20 -20																								
20.9	1	0	0	0	0	3	0	1	0	1	2	0	0	0	0	0	0	0	0	0	0	8	13	0
21 -21																								
21.9	0	0	0	0	1	3	0	1	1	1	2	0	0	1	0	0	0	0	1	0	0	11	0	0
22 -22																								
22.9	0	0	0	0	1	0	0	2	2	0	1	1	1	1	1	0	0	0	0	0	0	10	0	0
23 -23																								
23.9	0	0	0	0	1	1	0	0	1	1	0	0	0	1	1	1	0	0	0	1	0	8	0	0
24 -24																								
999	5	0	3	0	0	3	1	0	3	2	6	7	4	2	4	5	7	3	3	111		174	3	0
Total	763	210	107	63	47	52	34	11	25	18	19	13	9	8	8	6	7	3	4	6	1111	524	50	14

COUNTAB: RED LA, WA, NY & MT FRAMES DATE: 17-SEP-80 TIME: 15:00

Count of features by acres & total number of pixels.

Table For Pixel value(s) 0 through 5

Water Acres	Number of Pixels per Feature																						%	%
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20+	TOT	0	1
0 -1																								
0.9	43	36	6	3	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	91	47	40
1 -2																								
1.9	25	16	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	42	60	38
2 -3																								
2.9	290	29	6	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	326	89	9
3 -4																								
3.9	141	26	16	3	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	188	75	14
4 -5																								
4.9	91	30	12	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	143	64	21
5 -6																								
5.9	56	22	23	3	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	109	51	20
6 -7																								
6.9	21	13	11	7	7	2	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	64	33	20
7 -8																								
7.9	25	8	9	7	2	3	2	0	0	0	1	0	0	0	0	0	0	0	0	0	0	57	44	14
8 -9																								
8.9	10	14	6	7	8	1	5	1	0	0	0	0	0	0	0	0	0	0	0	0	0	52	19	27
9 -10																								
9.9	8	8	3	4	3	4	5	1	1	1	0	0	0	0	0	0	0	0	0	0	0	38	21	21
10 -11																								
10.9	10	3	3	4	8	9	2	3	3	0	1	0	0	0	0	0	0	0	0	0	0	46	22	7
11 -12																								
11.9	4	6	0	5	2	2	2	0	1	0	1	1	1	0	0	0	0	0	0	0	0	25	16	24
12 -13																								
12.9	5	4	4	1	2	6	2	2	1	1	0	0	0	0	0	0	0	0	0	0	0	28	18	14
13 -14																								
13.9	1	1	1	3	3	2	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	14	7	7
14 -15																								
14.9	2	0	2	4	4	1	2	0	2	2	1	2	0	1	0	0	0	0	0	0	0	23	9	0
15 -16																								
15.9	0	2	1	0	1	2	2	1	0	4	1	0	0	1	0	0	0	0	0	0	0	15	0	13
16 -17																								
16.9	2	1	1	2	1	0	2	0	1	1	2	0	0	0	0	0	0	0	0	0	0	13	15	8
17 -18																								
17.9	3	0	1	0	0	1	3	1	3	1	1	0	0	0	2	0	0	0	0	0	0	16	19	0
18 -19																								
18.9	0	0	1	0	2	0	3	0	0	1	1	1	2	1	0	0	0	0	0	0	0	12	0	0
19 -20																								
19.9	1	0	0	0	0	1	1	0	3	2	1	0	1	1	0	0	0	0	0	0	0	11	9	0
20 -21																								
20.9	1	0	0	0	0	3	0	0	1	1	2	0	0	0	0	0	0	0	0	0	0	8	13	0
21 -22																								
21.9	0	0	0	0	1	2	1	1	1	1	2	0	0	1	0	0	0	0	1	0	0	11	0	0
22 -23																								
22.9	0	0	0	0	1	0	0	2	2	0	1	1	1	1	1	0	0	0	0	0	0	10	0	0
23 -24																								
23.9	0	0	0	0	1	1	0	0	1	1	0	0	0	1	1	1	0	0	0	0	1	8	0	0
24 -999																								
999	5	0	2	1	0	2	2	0	1	4	4	7	5	1	5	5	6	5	3	2114		174	3	0
Total	744	219	109	65	52	42	41	13	22	21	19	12	10	8	9	6	6	5	4	2115	1524		49	14

COUNTAB: RED LA, WA, NY & MT FRAMES DATE: 17-SEP-80 TIME: 15:00

Count of features by acres & total number of pixels.

Table For Pixel value(s) 0 through 6

Water Acres	Number of Pixels per Feature																					TOT	% 0	% 1
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20+			
0 -1																								
0.9	39	39	6	3	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	91	43	43
1 -1																								
1.9	24	17	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	42	57	40
2 -1																								
2.9	286	33	6	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	326	88	10
3 -1																								
3.9	140	26	17	3	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	188	74	14
4 -1																								
4.9	89	31	12	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	143	62	22
5 -1																								
5.9	54	24	23	3	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	109	50	22
6 -1																								
6.9	20	13	11	8	7	2	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	64	31	20
7 -1																								
7.9	23	9	10	7	2	2	3	0	0	0	1	0	0	0	0	0	0	0	0	0	0	57	40	16
8 -1																								
8.9	10	10	10	6	9	1	5	1	0	0	0	0	0	0	0	0	0	0	0	0	0	52	19	19
9 -1																								
9.9	8	8	2	5	3	4	3	3	0	2	0	0	0	0	0	0	0	0	0	0	0	38	21	21
10 -1																								
10.9	9	4	3	4	8	7	4	3	3	0	1	0	0	0	0	0	0	0	0	0	0	46	20	9
11 -1																								
11.9	4	5	1	5	2	1	3	0	1	0	1	1	1	0	0	0	0	0	0	0	0	25	16	20
12 -1																								
12.9	5	4	3	2	2	5	3	1	2	1	0	0	0	0	0	0	0	0	0	0	0	28	18	14
13 -1																								
13.9	0	2	1	3	3	1	3	0	1	0	0	0	0	0	0	0	0	0	0	0	0	14	0	14
14 -1																								
14.9	2	0	2	4	4	0	3	0	2	2	1	2	0	1	0	0	0	0	0	0	0	23	9	0
15 -1																								
15.9	0	2	1	0	1	2	2	1	0	4	1	0	0	1	0	0	0	0	0	0	0	15	0	13
16 -1																								
16.9	2	1	0	2	2	0	1	1	0	2	2	0	0	0	0	0	0	0	0	0	0	13	15	8
17 -1																								
17.9	3	0	1	0	0	1	3	1	3	1	1	0	0	0	2	0	0	0	0	0	0	16	19	0
18 -1																								
18.9	0	0	1	0	1	1	3	0	0	1	1	1	1	2	0	0	0	0	0	0	0	12	0	0
19 -1																								
19.9	1	0	0	0	0	1	1	0	2	2	2	0	1	1	0	0	0	0	0	0	0	11	9	0
20 -1																								
20.9	1	0	0	0	0	2	0	1	0	2	2	0	0	0	0	0	0	0	0	0	0	8	13	0
21 -1																								
21.9	0	0	0	0	1	1	2	1	1	1	1	1	0	1	0	0	0	0	1	0	0	11	0	0
22 -1																								
22.9	0	0	0	0	0	1	0	2	2	0	1	1	0	1	1	1	0	0	0	0	0	10	0	0
23 -1																								
23.9	0	0	0	0	1	1	0	0	1	0	0	1	0	1	0	1	1	0	0	0	1	8	0	0
24 -1																								
999	5	0	1	1	1	2	2	0	1	3	4	5	6	3	5	4	7	5	3	1115		174	3	0
Total	725	228	112	68	54	35	44	18	19	22	19	12	9	11	8	6	8	5	4	1116	1524		48	15

COUNTAB: RED LA, WA, NY & MT FRAMES DATE: 17-SEP-80 TIME: 15:00

Count of features by acres & total number of pixels.

Table For Pixel value(s) 0 through 7

Water Acres	Number of Pixels per Feature																						%	%
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20+	TOT	0	1
0 -1																								
0.9	29	44	10	3	3	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	91	32	48
1 -1																								
1.9	23	18	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	42	55	43
2 -2																								
2.9	283	35	6	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	326	87	11
3 -3																								
3.9	134	29	18	4	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	188	72	15
4 -4																								
4.9	88	31	12	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	143	62	22
5 -5																								
5.9	52	25	24	3	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	109	48	23
6 -6																								
6.9	20	12	11	8	8	1	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	64	31	19
7 -7																								
7.9	20	11	11	7	1	2	4	0	0	0	1	0	0	0	0	0	0	0	0	0	0	57	35	19
8 -8																								
8.9	9	10	10	6	8	3	5	0	1	0	0	0	0	0	0	0	0	0	0	0	0	52	17	19
9 -9																								
9.9	8	7	3	4	4	4	3	2	0	3	0	0	0	0	0	0	0	0	0	0	0	38	21	18
10 -10																								
10.9	9	4	3	3	7	9	3	4	3	0	1	0	0	0	0	0	0	0	0	0	0	46	20	9
11 -11																								
11.9	3	6	1	4	3	1	3	0	1	0	1	1	1	0	0	0	0	0	0	0	0	25	12	24
12 -12																								
12.9	5	3	4	2	2	5	3	1	1	1	0	1	0	0	0	0	0	0	0	0	0	28	18	11
13 -13																								
13.9	0	2	1	3	2	1	4	0	1	0	0	0	0	0	0	0	0	0	0	0	0	14	0	14
14 -14																								
14.9	2	0	2	4	3	1	2	1	2	2	0	3	0	1	0	0	0	0	0	0	0	23	9	0
15 -15																								
15.9	0	2	1	0	1	2	1	1	1	3	2	0	0	1	0	0	0	0	0	0	0	15	0	13
16 -16																								
16.9	2	1	0	1	2	1	0	2	0	2	1	1	0	0	0	0	0	0	0	0	0	13	15	8
17 -17																								
17.9	3	0	1	0	0	1	2	2	3	1	1	0	0	0	2	0	0	0	0	0	0	16	19	0
18 -18																								
18.9	0	0	1	0	0	2	3	0	0	1	1	1	1	2	0	0	0	0	0	0	0	12	0	0
19 -19																								
19.9	1	0	0	0	0	1	1	0	2	2	2	0	1	1	0	0	0	0	0	0	0	11	9	0
20 -20																								
20.9	1	0	0	0	0	2	0	1	0	2	2	0	0	0	0	0	0	0	0	0	0	8	13	0
21 -21																								
21.9	0	0	0	0	0	2	1	2	1	1	1	1	0	1	0	0	0	0	0	0	1	11	0	0
22 -22																								
22.9	0	0	0	0	0	0	1	2	2	0	1	1	0	1	1	1	0	0	0	0	0	10	0	0
23 -23																								
23.9	0	0	0	0	1	1	0	0	1	0	0	1	0	1	0	1	1	0	0	0	1	8	0	0
24 -24																								
999	4	1	1	1	1	2	1	1	1	3	4	5	5	4	4	3	9	4	4	1115		174	2	1
Total	697	241	121	67	50	42	41	21	21	22	18	15	8	12	7	5	10	4	4	1117	1524		46	16

COUNTAB: RED LA, WA, NY & MT FRAMES DATE: 17-SEP-80 TIME: 15:00

Count of features by acres & total number of pixels.

Table For Pixel value(s) 0 through 8

Water Acres	Number of Pixels per Feature																						%	%
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20+	TOT	0	1
0 -1																								
0.9	17	56	9	4	3	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	91	19	62
1 -1																								
1.9	20	21	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	42	48	50
2 -1																								
2.9	282	35	7	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	326	87	11
3 -1																								
3.9	130	31	21	4	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	188	69	16
4 -1																								
4.9	87	28	14	13	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	143	61	20
5 -1																								
5.9	51	26	18	9	3	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	109	47	24
6 -1																								
6.9	20	12	11	8	8	1	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	64	31	19
7 -1																								
7.9	20	11	11	7	1	1	5	0	0	0	0	1	0	0	0	0	0	0	0	0	0	57	35	19
8 -1																								
8.9	8	11	9	6	7	3	6	1	1	0	0	0	0	0	0	0	0	0	0	0	0	52	15	21
9 -1																								
9.9	8	7	3	4	4	3	4	2	0	3	0	0	0	0	0	0	0	0	0	0	0	38	21	18
10 -1																								
10.9	9	4	3	3	7	9	3	3	4	0	1	0	0	0	0	0	0	0	0	0	0	46	20	9
11 -1																								
11.9	3	6	1	4	2	2	2	1	1	0	1	1	1	0	0	0	0	0	0	0	0	25	12	24
12 -1																								
12.9	5	3	4	2	2	5	3	1	1	1	0	1	0	0	0	0	0	0	0	0	0	28	18	11
13 -1																								
13.9	0	2	1	3	1	2	4	0	0	1	0	0	0	0	0	0	0	0	0	0	0	14	0	14
14 -1																								
14.9	2	0	1	5	1	3	1	2	2	2	0	3	0	1	0	0	0	0	0	0	0	23	9	0
15 -1																								
15.9	0	2	1	0	1	2	0	2	1	3	2	0	0	1	0	0	0	0	0	0	0	15	0	13
16 -1																								
16.9	2	1	0	1	2	1	0	2	0	2	0	2	0	0	0	0	0	0	0	0	0	13	15	8
17 -1																								
17.9	3	0	0	1	0	1	2	2	3	1	1	0	0	0	2	0	0	0	0	0	0	16	19	0
18 -1																								
18.9	0	0	0	1	0	1	2	2	0	0	2	0	2	2	0	0	0	0	0	0	0	12	0	0
19 -1																								
19.9	1	0	0	0	0	1	1	0	2	2	2	0	1	1	0	0	0	0	0	0	0	11	9	0
20 -1																								
20.9	1	0	0	0	0	1	1	1	0	1	3	0	0	0	0	0	0	0	0	0	0	8	13	0
21 -1																								
21.9	0	0	0	0	0	2	1	2	1	1	1	0	1	1	0	0	0	0	0	0	1	11	0	0
22 -1																								
22.9	0	0	0	0	0	0	1	1	2	1	0	2	0	1	1	1	0	0	0	0	0	10	0	0
23 -1																								
23.9	0	0	0	0	1	1	0	0	1	0	0	1	0	1	0	0	2	0	0	0	1	8	0	0
24 -1																								
999	3	1	2	1	1	2	1	1	0	4	3	4	5	3	3	6	6	6	6	1115		174	2	1
Total	672	257	117	78	45	43	41	24	20	24	16	15	10	11	6	7	8	6	6	1117	1524		44	17

COUNTAB: RED LA, WA, NY & MT FRAMES DATE: 17-SEP-80 TIME: 15:00

Count of features by acres & total number of pixels.

Table For Pixel value(s) 0 through 9

Water Acres	Number of Pixels per Feature																						%	%
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20+	TOT	0	1
0 -1																								
0.9	0	68	11	6	3	1	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	91	0	75
1 -1																								
1.9	18	22	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	42	43	52
2 -1																								
2.9	274	38	6	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	326	86	12
3 -1																								
3.9	130	29	23	4	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	188	69	15
4 -1																								
4.9	85	26	18	11	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	143	59	18
5 -1																								
5.9	51	24	19	10	3	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	109	47	22
6 -1																								
6.9	19	13	11	7	8	1	4	0	0	0	0	0	0	1	0	0	0	0	0	0	0	64	30	20
7 -1																								
7.9	20	10	12	6	2	1	5	0	0	0	0	1	0	0	0	0	0	0	0	0	0	57	35	18
8 -1																								
8.9	8	10	10	6	6	3	7	1	1	0	0	0	0	0	0	0	0	0	0	0	0	52	15	19
9 -1																								
9.9	8	7	3	3	4	3	3	4	0	3	0	0	0	0	0	0	0	0	0	0	0	38	21	18
10 -1																								
10.9	8	4	4	2	8	8	3	4	3	1	1	0	0	0	0	0	0	0	0	0	0	46	17	9
11 -1																								
11.9	3	4	3	3	3	2	2	0	2	0	0	2	1	0	0	0	0	0	0	0	0	25	12	16
12 -1																								
12.9	5	3	2	3	3	5	1	3	1	1	0	1	0	0	0	0	0	0	0	0	0	28	18	11
13 -1																								
13.9	0	2	1	2	2	2	4	0	0	1	0	0	0	0	0	0	0	0	0	0	0	14	0	14
14 -1																								
14.9	2	0	1	4	2	1	3	2	2	2	0	2	1	1	0	0	0	0	0	0	0	23	9	0
15 -1																								
15.9	0	2	1	0	1	2	0	2	1	3	1	1	0	1	0	0	0	0	0	0	0	15	0	13
16 -1																								
16.9	2	1	0	1	2	1	0	2	0	2	0	2	0	0	0	0	0	0	0	0	0	13	15	8
17 -1																								
17.9	3	0	0	1	0	1	1	3	3	0	2	0	0	0	2	0	0	0	0	0	0	16	19	0
18 -1																								
18.9	0	0	0	1	0	1	2	1	1	0	2	0	2	2	0	0	0	0	0	0	0	12	0	0
19 -1																								
19.9	1	0	0	0	0	1	1	0	2	1	3	0	1	1	0	0	0	0	0	0	0	11	9	0
20 -1																								
20.9	1	0	0	0	0	0	2	1	0	0	4	0	0	0	0	0	0	0	0	0	0	8	13	0
21 -1																								
21.9	0	0	0	0	0	1	2	1	2	0	2	0	1	1	0	0	0	0	0	0	1	11	0	0
22 -1																								
22.9	0	0	0	0	0	0	1	1	2	1	0	2	0	1	1	1	0	0	0	0	0	10	0	0
23 -1																								
23.9	0	0	0	0	1	1	0	0	1	0	0	1	0	1	0	0	2	0	0	0	1	8	0	0
24 -1																								
999	2	2	1	2	1	2	1	1	0	3	4	3	5	4	3	6	6	6	3	3	116	174	1	1
Total	645	265	128	75	52	39	42	27	22	20	19	15	11	13	6	7	8	6	3	3	1181	524	42	17

APPENDIX H
FINAL SIGNATURES CODED FOR DAM PACKAGE

WATER LIMITS H-2

WATER-NESS TRANSFORMATIONS H-3

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**DAM.WATER-LIM/3A-LIN-N1  (8309)
** WATER LIMITS FOR LANDSAT-3 MSS 'X' TAPES
;; DERIVED FEB-SEP 1980 BY WEIGHTED FIT OF LINEAR DISCRIMINANT TO
;; 1300 LABELLED WATER AND 'NEAR-WATER' POINTS ON 4 LANDSAT SCENES:
;;      30282-15120   NEW YORK       26 MAY 78    58 DEG SUNEL
;;      30130-18032   WASHINGTON     13 JUL 78    55 DEG SUNEL
;;      30194-17182   MONTANA        15 SEP 78    40 DEG SUNEL
;;      30216-16024   LOUISIANA      07 OCT 78    44 DEG SUNEL
;; VERIFIED WITH SAME-PASS COLOR IR AERIAL PHOTOGRAPHY:
;;      ALL WATER PIXELS:        1% OMISSION ERRORS, 1% COMMISSION ERRORS
;;      WATER BODIES >= 10 AC:  9% OMISSION ERRORS, 9% COMMISSION ERRORS
;; IF (+.3159*CH1+.0320*CH2+.2959*CH3-2.7679*CH4+7.128) > 0 PIXEL = WAT
NAME,WATER-LIM/3A-LIN-N1
SHARPENING,1,SAMPLES,0,0,,NO SHARPENING
SHARPENING,2,SAMPLES,0,0,,NO SHARPENING
SHARPENING,3,SAMPLES,0,0,,NO SHARPENING
SHARPENING,4,SAMPLES,0,0,,NO SHARPENING
LINEAR,1,WEIGHTS,-.3159,-.0320,-.2959,+2.7679          ,, WATER-NESS
LINEAR,1,GAIN,1
LINEAR,1,BIAS,+0.072  ,, BIAS = -7.128+8.0 SO PIXELS < 8.0 ARE WATER
LINEAR,2,WEIGHTS,0,0,0,+1 ,,, LINEAR,2,GAIN,1,BIAS,0  ,, RAW CHANNEL 4
CHANNELS,LINEAR,2,1 ,,, RADIANCE, 0,20, 0,7
```

LANDSAT-3C 'AM' AND 'PM' TAPES FROM THE MASTER DATA PROCESSOR (MDP) HAVE THE SAME CALIBRATION FOR CHANNELS 1, 2, AND 3 AS LANDSAT-3A 'X' TAPES.
MSS CHANNEL 4 (BAND 7) VALUES ON LANDSAT-3C 'AM' AND 'PM' TAPES ARE EXACTLY TWICE (2X) THE CORRESPONDING VALUES ON LANDSAT-3A 'X' TAPES.

```
**DAM.WATER-LIM/3C-LIN-N1  (8009)
** WATER LIMITS FOR LANDSAT-3 MSS 'AM' OR 'PM' TAPES
;; DERIVED FEB-SEP 1980 BY WEIGHTED FIT OF LINEAR DISCRIMINANT TO
;; 1300 LABELLED WATER AND 'NEAR-WATER' POINTS ON 4 LANDSAT SCENES:
;;      30282-15120   NEW YORK       26 MAY 78    58 DEG SUNEL
;;      30130-18032   WASHINGTON     13 JUL 78    55 DEG SUNEL
;;      30194-17182   MONTANA        15 SEP 78    40 DEG SUNEL
;;      30216-16024   LOUISIANA      07 OCT 78    44 DEG SUNEL
;; VERIFIED WITH SAME-PASS COLOR IR AERIAL PHOTOGRAPHY:
;;      ALL WATER PIXELS:        1% OMISSION ERRORS, 1% COMMISSION ERRORS
;;      WATER BODIES >= 10 AC:  9% OMISSION ERRORS, 9% COMMISSION ERRORS
;; IF (+.3159*CH1+.0320*CH2+.2959*CH3-1.3840*CH4+7.128) > 0 PIXEL = WAT
NAME,WATER-LIM/3C-LIN-N1
SHARPENING,1,SAMPLES,0,0,,NO SHARPENING
SHARPENING,2,SAMPLES,0,0,,NO SHARPENING
SHARPENING,3,SAMPLES,0,0,,NO SHARPENING
SHARPENING,4,SAMPLES,0,0,,NO SHARPENING
LINEAR,1,WEIGHTS,-.3159,-.0320,-.2959,+1.3840          ,, WATER-NESS
LINEAR,1,GAIN,1
LINEAR,1,BIAS,+0.672  ,, BIAS = -7.128+8.0 SO PIXELS < 8.0 ARE WATER
LINEAR,2,WEIGHTS,0,0,0,+1 ,,, LINEAR,2,GAIN,1,BIAS,0  ,, RAW CHANNEL 4
CHANNELS,LINEAR,2,1 ,,, RADIANCE, 0,40, 0,7
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**DAM.WATER-NESS/3A          (8009)
** WATER-NESS TRANSFORM FOR LANDSAT-3 MSS 'X' TAPES
,, DERIVED FEB-SEP 1980 BY WEIGHTED FIT OF LINEAR DISCRIMINANT TO
,, 1300 LABELLED WATER AND 'NEAR-WATER' POINTS ON 4 LANDSAT SCENES:
,,      30082-15120   NEW YORK       26 MAY 78    58 DEG SUNEL
,,      30130-18032   WASHINGTON     13 JUL 78    55 DEG SUNEL
,,      30194-17182   MONTANA        15 SEP 78    40 DEG SUNEL
,,      30216-16024   LOUISIANA      07 OCT 78    44 DEG SUNEL
,, VERIFIED WITH SAME-PASS COLOR IR AERIAL PHOTOGRAPHY:
,,      ALL WATER PIXELS:          1% OMISSION ERRORS, 1% COMMISSION ERRORS
,,      WATER BODIES >= 10 AC: 9% OMISSION ERRORS, 9% COMMISSION ERRORS
,, IF (+.3159*CH1+.0320*CH2+.2959*CH3-2.7679*CH4+7.128) > 0 PIXEL = WATER
NAME,WATER-NESS/3A-LIN-N1
SHARPENING,1,SAMPLES,0,0,,NO SHARPENING
SHARPENING,2,SAMPLES,0,0,,NO SHARPENING
SHARPENING,3,SAMPLES,0,0,,NO SHARPENING
SHARPENING,4,SAMPLES,0,0,,NO SHARPENING
LINEAR,1,WEIGHTS,-.3159,-.0320,-.2959,+2.7679          ,, WATER-NESS
LINEAR,1,GAIN,1
LINEAR,1,BIAS,+0.872   ,, BIAS = -7.128+8.0 SO PIXELS < 8.0 ARE WATER
LINEAR,2,WEIGHTS,0,0,0,+1  ,,, LINEAR,2,GAIN,1,BIAS,0   ,, RAW CHANNEL 4
CHANNELS,LINEAR,1,2  ,,, RADIANCE, 0,16, 0,20
SYM,0,0,9,9,,,SYM,A,10,J,19,,,SYM,,,20,127
**
**    SYMBOLS        MEANING (LANDSAT-3A)
**   '0' - '7'   =   WATER
**   '8' - '9'   =   MOSTLY WATER
**   'A' - 'G'   =   PARTLY WATER
```

LANDSAT-3C 'AM' AND 'PM' TAPES FROM THE MASTER DATA PROCESSOR (MDP) HAVE THE SAME CALIBRATION FOR CHANNELS 1, 2, AND 3 AS LANDSAT-3A 'X' TAPES.
MSS CHANNEL 4 (BAND 7) VALUES ON LANDSAT-3C 'AM' AND 'PM' TAPES ARE EXACTLY TWICE (2X) THE CORRESPONDING VALUES ON LANDSAT-3A 'X' TAPES.

```
**DAM.WATER-NESS/3C          (8009)
** WATER-NESS TRANSFORM FOR LANDSAT-3 MSS 'AM' OR 'PM' TAPES
,, DERIVED FEB-SEP 1980 BY WEIGHTED FIT OF LINEAR DISCRIMINANT TO
,, 1300 LABELLED WATER AND 'NEAR-WATER' POINTS ON 4 LANDSAT SCENES:
,,      30082-15120   NEW YORK       26 MAY 78    58 DEG SUNEL
,,      30130-18032   WASHINGTON     13 JUL 78    55 DEG SUNEL
,,      30194-17182   MONTANA        15 SEP 78    40 DEG SUNEL
,,      30216-16024   LOUISIANA      07 OCT 78    44 DEG SUNEL
,, VERIFIED WITH SAME-PASS COLOR IR AERIAL PHOTOGRAPHY:
,,      ALL WATER PIXELS:          1% OMISSION ERRORS, 1% COMMISSION ERRORS
,,      WATER BODIES >= 10 AC: 9% OMISSION ERRORS, 9% COMMISSION ERRORS
,, IF (+.3159*CH1+.0320*CH2+.2959*CH3-1.3840*CH4+7.128) > 0 PIXEL = WATER
NAME,WATER-NESS/3C-LIN-N1
SHARPENING,1,SAMPLES,0,0,,NO SHARPENING
SHARPENING,2,SAMPLES,0,0,,NO SHARPENING
SHARPENING,3,SAMPLES,0,0,,NO SHARPENING
SHARPENING,4,SAMPLES,0,0,,NO SHARPENING
LINEAR,1,WEIGHTS,-.3159,-.0320,-.2959,+1.3840          ,, WATER-NESS
LINEAR,1,GAIN,1
LINEAR,1,BIAS,+0.872   ,, BIAS = -7.128+8.0 SO PIXELS < 8.0 ARE WATER
LINEAR,2,WEIGHTS,0,0,0,+1  ,,, LINEAR,2,GAIN,1,BIAS,0   ,, RAW CHANNEL 4
CHANNELS,LINEAR,1,2  ,,, RADIANCE, 0,16, 0,40
SYM,0,0,9,9,,,SYM,A,10,J,19,,,SYM,,,20,127
**
**    SYMBOLS        MEANING (LANDSAT-3C)
**   '0' - '7'   =   WATER
**   '8' - '9'   =   MOSTLY WATER
**   'A' - 'G'   =   PARTLY WATER
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