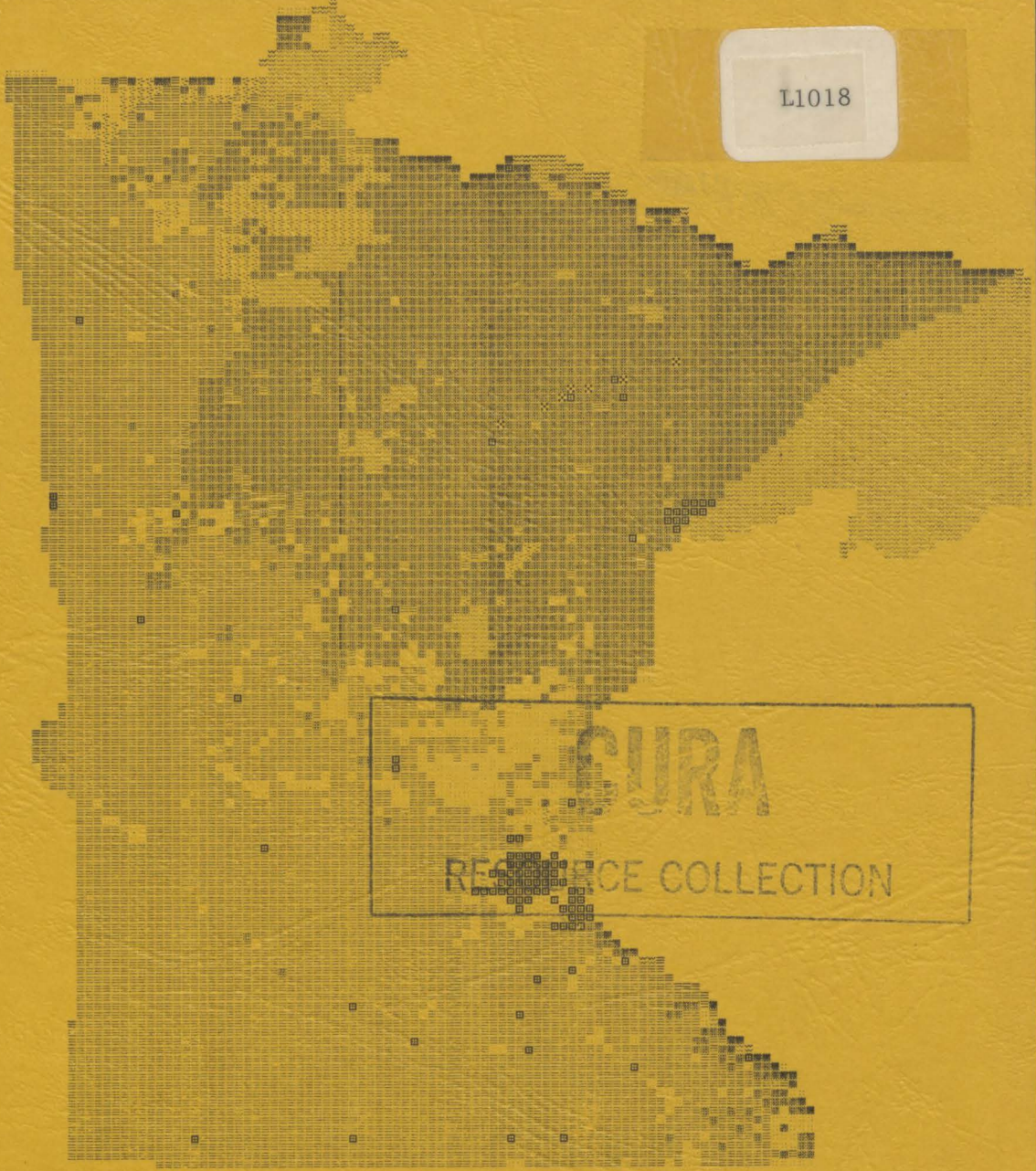


L1018

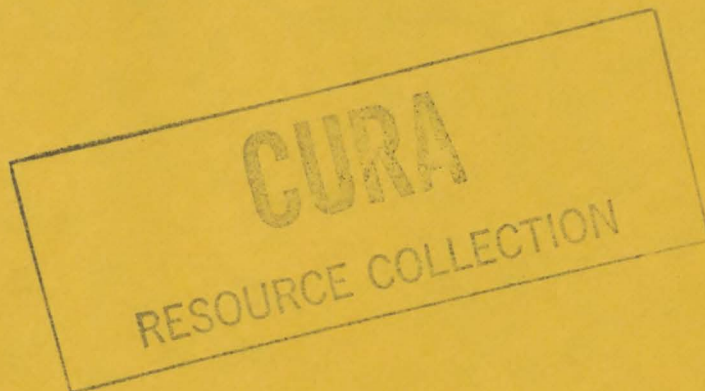
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CUA
RESOURCE COLLECTION



**MINNESOTA LAND MANAGEMENT
INFORMATION SYSTEM**



**UNIVERSITY OF MINNESOTA
CENTER FOR URBAN AND
REGIONAL AFFAIRS**

STATE PLANNING AGENCY

**A TEST USING SYSTEM 2000 WITH
MLMIS DATA**

KENNETH KOZAR

AUGUST 1974

E R R A T A

RESPONSE TO QUESTION 1 (PAGE 7):

? TALLY/EACH/FOREST COVER:

ELEMENT-	FOREST COVER
*****	*****
FREQUENCY	VALUE
751	Ø
641	1
1883	2
1Ø	5
2Ø98	6
6	7

6 UNIQUE VALUES

5389 OCCURRENCES

RESPONSE TO QUESTION 5D (PAGE 10):

? PRINT LANDU WH SAME:
LANDU* 1
LANDU* 5
LANDU* 1
LANDU* 1
LANDU* 1
LANDU* 1
LANDU* 1
LANDU* 1

THE MINNESOTA LAND MANAGEMENT
INFORMATION SYSTEM STUDY

The Minnesota Land Management Information System project is an endeavor of the Center for Urban and Regional Affairs (CURA) of the University of Minnesota and the State Planning Agency. Important contributions to the project have been made by other executive and legislative branches of state government, numerous University departments and other institutions.

The primary goal of this project is to improve the quality of public-private sector land use decisions. The project is doing this by building a data bank containing information on physical resources, relative accessibility to market of these resources, and information on current land use, zoning, and ownership patterns.

Concurrent with the data collection effort is a research program that is using the collected data to simulate land use decisions and conflicts.

BACKGROUND

System 2000 (S2K) is a generalized data base management software system developed and sold by MRI Corporation of Austin, Texas. The S2K software is installed at the University of Minnesota in an interactive mode on the CDC 6400 computer. Interactive mode means that a person can sit at a computer terminal device linked to the computer through a standard telephone line and enter commands to interrogate and change the data in a previously-structured data base. S2K also exists in a batch mode on the University of Minnesota Cyber 74 computer. This means that certain interrogations (much more limited than the interactive mode) and updates of a data base could be made by submitting a punched computer program with appropriate commands. The Cyber 74 also allows Programming Language Interface (PLI) where data bases can be interrogated within a FORTRAN or COBOL computer program. Only the interactive mode on the CDC 6400 has been implemented and tested with MLMIS data to date.

The test area for this experiment consisted of nine townships in Itasca County. These townships contained a total of 5389 parcels, with each parcel being classified according to the variables listed in Appendix A (titled Exhibit I).

BUILDING THE DATA BASE

The first task in this experiment was to define the data base. The computer must be informed of the hierarchy of the MLMIS data. The pyramid hierarchy (FIG. 1), shows that the state of Minnesota has many counties, each county has many townships, each township has many sections, and each section has many parcels. The base is 1.4 million parcels wide. Data can be stored at each level of the hierarchy. For this experiment, mineral potential is stored at the township level and all remaining data is stored at the parcel level.

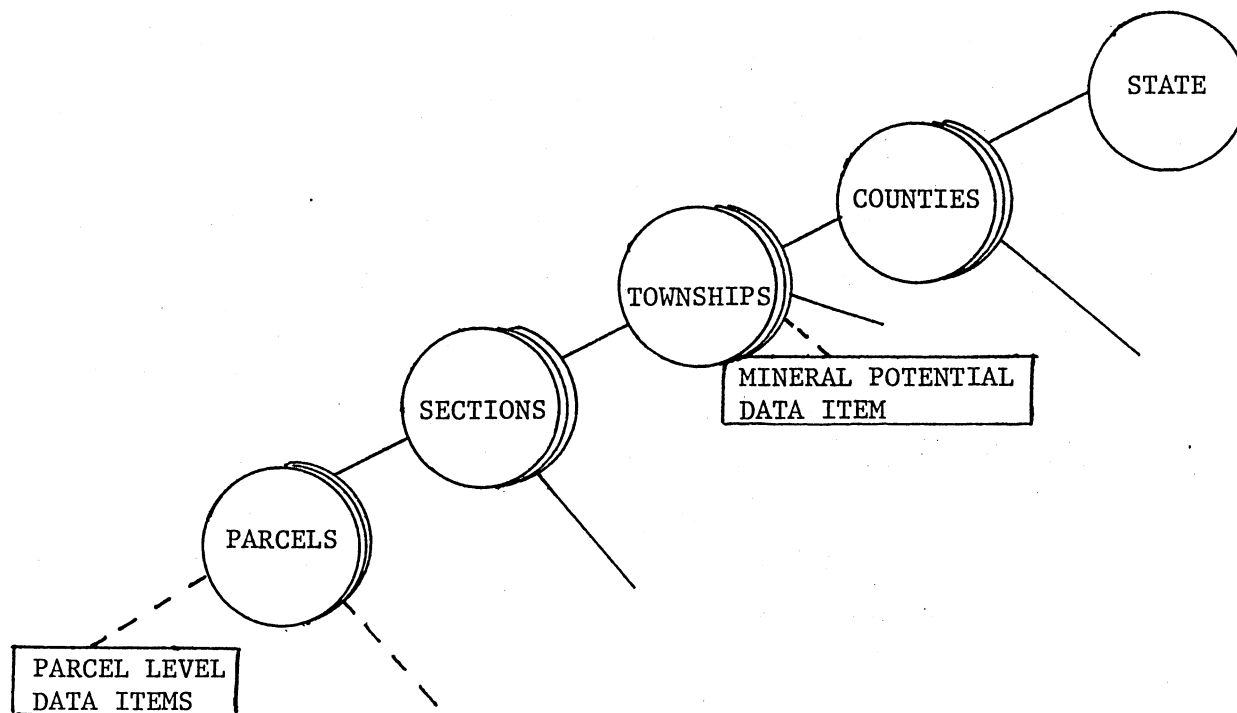


FIG. 1.--HIERARCHY OF MLMIS DATA

The generalized data definition shown in FIG. 1. is communicated to S2K and the computer through a formal definition. This definition is shown in FIG. 2. As can be seen from FIG. 1. and FIG. 2., descriptive data is stored at the township and parcel level.

```

DATA BASE NAME IS UCC102NINER
DEFINITION NUMBER      1
DATA BASE CYCLE        1
  1* COUNTY NAME (NAME X(10))
  2* COUNTY NO (INTEGER NUMBER 99)
  3* TOWNSHIP-RANGE (R6)
  30* TOWNSHIP NO (INTEGER NUMBER 999 IN 3)
  31* RANGE NO (INTEGER NUMBER 999 IN 3)
  32* MINERAL POT (INTEGER NUMBER 9 IN 3)
  33* SECTION (R6 IN 3)
  34* SECTION NO (INTEGER NUMBER 99 IN 33)
  35* PARCELS (R6 IN 33)
    36* 00 NO (INTEGER NUMBER 99 IN 35)
    37* GOVT LOT NO (INTEGER NUMBER 99 IN 35)
    38* MCD60 (NAME XXX IN 35)
    39* MCD70 (NAME XXX IN 35)
    40* LANDU (NAME X IN 35)
    41* WD (NAME X IN 35)
    42* OWNR (NAME XX IN 35)
    43* RELOWNR (NAME X IN 35)
    441* SOILBELOW (NAME X IN 35)
    442* SOILSURFACE (NAME X IN 35)
    443* DRAINAGE (NAME X IN 35)
    444* COLOR (NAME X IN 35)
    45* GEOM (NAME XXX IN 35)
    46* LEGD (NAME XXX IN 35)
    47* SCHOOLD (NAME XXX IN 35)
    48* ZONING (NAME XX IN 35)
    49* P80 (NAME X IN 35)
    50* FOREST COVER (NAME X IN 35)
    51* H0 (NAME X IN 35)
    511* SPECIE (NAME X IN 35)
    512* AGRICSUITABILITY (NAME XX IN 35)
    513* FOREST SUITABILITY (NAME XX IN 35)
    614* FOREST PROD (NAME X IN 35)
  52* DNRDATA (R6 IN 35)
    53* ACQUISITION (NAME X IN 52)
    54* OWNERUSE (NAME XX IN 52)
    55* MINSTATUS (NAME X IN 52)
    56* ACCESS (NAME X IN 52)
    57* COUNTYZONE (NAME X IN 52)
    58* CLASSIF (NAME XX IN 52)
    59* DISP (NAME X IN 52)
    60* MGMTUNIT (NAME X IN 52)

```

FIG. 2.--DATA BASE DEFINITION

A few comments are in order about the data definition. The data base is named UCC102NINER according to University S2K rules. The actual data definition starts with the component "1* COUNTY NAME (.)". Each data element is contained on one line and is called a component.

Within an S2K definition, there are several types of components. For example, in FIG. 2., "COUNTY NAME" is a named component, "COUNTY NO" is an integer component, and "TOWNSHIP-RANGE" is a repeating group component. The integer and named components should be self explanatory; the repeating group requires some explanation.

The data definition in FIG. 2. starts at the county level, not the state level as is shown in FIG. 1. Each indentation in the definition means that there is a new level of data. S2K is informed that there is a new level of data through the "RG" indication in the definition. Note that component 3 (C3) is an indicator of the township and range repetitions by the RG in the component definition. The actual township and range numbers are contained in components C30 and C31. Likewise, SECTION (C33) and PARCELS (C35) are repeating groups. "TOWNSHIP-RANGE" repeats within each county, "SECTION" repeats within each "TOWNSHIP-RANGE", and "PARCELS" repeats within each "SECTION".

The "DNRDATA" component (C52) is defined as a repeating group for a special reason. This data does not occur for every parcel, only those owned by DNR. By making the component a repeating group, S2K does not reserve storage unless the data actually exists. This is similar to having the capability of a variable length record. It would also provide the capability for indicating a multiply-owned parcel if the original data could somehow specify this condition.

After completing the data base definition and communicating the definition to the computer, the data from the nine test townships had to be loaded into the data structure. This means the data was converted into data strings that follow the same form as the definition. A special FORTRAN program had to be written for this purpose. The program reads each parcel record and checks to see if a new county, township, section or a new parcel identifier appears. At least one of these conditions must occur, depending on the level encountered. The program strings out the data in a form acceptable to S2K and the previously entered definition. A listing of the program is shown in Appendix B. The program was written to run on the CDC CYBER 74 and have as output a file of data strings acceptable to the S2K definition shown in FIG. 2.

The next step is to actually load the data strings into the computer and to have S2K build all the inverted files. This step is also done on the CYBER 74. S2K uses these inverted files to do the selective retrievals. For example, all parcels having identical land use codes would be linked together. Likewise, all parcels with identical ownership codes would be linked together. With much simplification, the computer stores lists of computer memory locations for items with like codes. Then, when a command instructing the machine to "PRINT PARCELS WHERE LANDU EQ 1 AND OWNERSHIP SPANS 70*79" is issued, the computer, through S2K files, checks these linked lists for parcels possessing the desired characteristics. This process is very flexible, although it can consume large amounts of memory and computer time to build the inverted files.

The inverted files of the data base must next be sent from the CYBER 74 to the CDC 6400, the time sharing computer that contains S2K in the interactive mode. This is done with the program shown in Appendix C. The data base is then at the CDC 6400 on a temporary file and must be preserved from a terminal device. The data base is then ready for retrievals and updates from a computer terminal.

RETRIEVAL EXAMPLES

This section covers a number of typical inquiries using System 2000. These sets of inquiries are representative of questions a resource planner may ask via an interactive terminal device. All of the sample inquiries were actually typed on a computer terminal and the responses shown are actual outputs received from the terminal.

All of the inquiries are made of the data base for the following nine townships in Itasca county:

T59N, R24W
T59N, R25W
T59N, R26W

T60N, R24W
T60N, R25W
T60N, R26W

T61N, R24W
T61N, R25W
T61N, R26W

QUESTION 1. LIST THE FREQUENCY WITH WHICH EACH TYPE OF FOREST COVER OCCURS IN THE NINE TOWNSHIPS.

The System 2000 command follows the question mark (?) in the figure below. "TALLY/EACH/FOREST COVER:" was typed in by the user of the terminal.

System 2000 then responded with an identification of the element being tallied, the values of the forest cover code encountered in the nine townships, and the frequency with which each value occurred. For example, the forest cover code of 2 occurred 1883 times. By checking Appendix A (EXHIBIT I) under the Forest Cover variable in column 54; it then can be seen that a forest cover code of 2 indicates a cover type of spruce-fir.

The TALLY/EACH/. . . .: command is used to see how many times something occurs before asking for a list of the variable. For example, if a user would have asked for a list of all parcel numbers where forest cover is 6, the user would receive a list 2098 lines long. At a teletype terminal, this could result in a very time consuming process. A request requiring a long list should only be done if the list is absolutely needed and other means of obtaining such a list have been explored.

- QUESTION 2. COUNT THE NUMBER OF PARCELS WHICH ARE:
- a. MANAGED BY LANDS AND FOREST AND
 - b. ADJOIN A LAKE AND
 - c. HAVE A RECOMMENDED DISPOSITION OF - TO BE OFFERED FOR SALE

The System 2000 command follows the question marks in the following figure.

```

----
? PRINT COUNT PARCELS WHERE OWNERUSE SPANS 20*21 AND WO EQ 2
----

? AND DISP EO 4:
-      0 SELECTED DATA SETS -
----

```

- QUESTION 4. COUNT THE NUMBER OF PARCELS WHICH ARE:
- a. COVERED WITH A FOREST SPECIE OTHER THAN ASPEN
 - b. BUT WHOSE SOIL IS BEST SUITED FOR ASPEN
 - c. AND ARE MANAGED BY LANDS AND FOREST

The System 2000 command and response follow:

 ? PRINT COUNT PARCELS WHERE FOREST COVER NE 6 AND

 ? SPECIE EO 8 AND OWNERUSE SPANS 20*21:
 CNT PARCELS* 270

 This might indicate that some action could be taken by Lands and Forests if more aspen were desired. Great caution should be taken, however, note that these cases are made much simpler than real life to illustrate System 2000 capabilities and data which presently is in the data base.

- QUESTION 5A. COUNT THE NUMBER OF PARCELS WHICH ARE:
- a. PRIVATELY OWNED AND
 - b. ADJOIN A LAKE

The System 2000 command and response is:

 ? PRINT COUNT PARCELS WHERE OWNER EO 0 AND OWNERUSE FAILS AND WO EO

 ? 2:
 CNT PARCELS* 921

for "RANGE NO", "C34" for "SECTION NO", and "C36" for "QQ NO".

Once it is known where these parcels are geographically located, they can be found on a map. One final question may be:

QUESTION 5D. WHAT IS THE LAND USE FOR EACH OF THE LOCATED PARCELS?

The System 2000 command and response follows:

There are 6 parcels with a code of 1 or a land use of forest and one parcel which is coded 5 for urban-residential. This is where a caution about the capabilities of the data is necessary. The data in MLMIS was not collected for site planning, but for state, regional, or county planning. The data is dominant by area for parcel or by some established rule. For example, any parcel with five or more dwellings was classified urban-residential. If a parcel was 51% poorly drained, all of the parcel was coded poorly drained. The same is true of the ownership variables which were used in these inquiries. This is not to say the data is bad, but it must be recognized that the capabilities of the data are limited.

FURTHER CONSIDERATIONS

This test did not consider the Programming Language Interface (PLI) option of System 2000 which is available on the CDC Cyber 74. PLI would enable a programmer to first select parcels with certain characteristics and then manipulate the parcels in some way. This manipulation could include statistical summaries or mapping. For example, all parcels that have a land use of forest, ownership by the state, no highway touching the parcel, and predominate tree species of pine could be selected and grouped within the computer on a file. The parcels could then be mapped. However, a FORTRAN program could be written to do the same retrieval. The unknown factor is how many times these questions will be asked for how big an area. Then and only then can the feasibility of using a generalized data management system be evaluated versus custom FORTRAN programs. Update facilities using S2K must also be tested. These facilities could decrease the amount of time to input and error-check new data.

The feasibility of adding X-Y coordinates to each parcel will also be considered. This will require changing the data base definition and adding X-Y values to each parcel. Areas could then be delimited by using the SPANS function and boundary values of X and Y.

APPENDIX A

VARIABLES CONTAINED ON EACH PARCEL

RECORD IN THE S2K TEST

EXHIBIT I

DATA AVAILABLE FOR ITASCA COUNTY BY
40 ACRE CELL OR GOVERNMENT LOT

<u>Column Number</u>	<u>Variable</u>		
1-2	County Number		
3-5	Township Number	30	
6-8	Range Number		
9-10	Section Number	31-32	
11-12	Quarter-Quarter Section Number	33-36	
13-14	Government Lot Number	33	
15-16	Blank		
17-19	New County Number (3-Digit)		
20-22	1960 MCD Number		
23-25	1970 MCD Number	34	
26	Land Use Code		
	1 - Forested		
	2 - Cultivated		
	3 - Water		
	4 - Marsh		
	5 - Urban-Residential		
	6 - Extractive		
	7 - Open or Pasture	36	
	8 - Urban Non-Residential		
	9 - Transportation		
27	Water Orientation	37-39	
	1 - Island	40-42	
	2 - Lake		
	3 - Permanent River and Stream	43-45	
	4 - Intermittent River and Stream		
	5 - Drainage Ditch	46-48	
28-29	Ownership - Federal	49	
	01 - BWCA (from USFS maps)		
	02 - Other National Forests		
	03 - BLM		
	04 - National Wildlife Refuge		
	05 - Waterfowl Production Areas (Ownership)		
	(Ownership - Federal)		
	06 - Waterfowl Production Areas (Easement Only)		
	07 - National Park Service		
	08 - Corps of Engineers (Ownership)		
	09 - Corps of Engineers (Flowage Rights)		
	10 - Other Federal Agencies		
	14 - National Wildlife Refuge (Flowage Rights Only)		
	15 - National Wildlife Refuge (Lease to State of Minnesota)		
	Completeness of Ownership		
	0 - 37 or greater Acres		
	2 - Other than 0		
	Blank		
	Soils		
	Texture Below 5 Feet		
	S - Sandy		
	L - Loamy/Silty		
	C - Clayey		
	X - Sandy and Loamy		
	Y - Silty and Clayey		
	R - Bedrock		
	Texture Surface to 5 Feet		
	S - Sandy		
	L - Loamy/Silty		
	C - Clayey		
	Drainage		
	W - Well Drained (Water below Root Zone)		
	P - Poorly Drained (Water in Root Zone)		
	Soil Color		
	D - Dark		
	L - Light		
	Geomorphic Region		
	Blank		
	Legislative District		
	School District		
	Mineral Potential (Coded 1-5 by Township)		
	1 - Highest Potential to		
	5 - No Potential		

- 50-51 Zoning
00 - Open Space
WW - Water
PP - Public
MA - Municipal Area
IL - Industrial, Light
IH - Industrial, Heavy
CR - Commercial Recreation
SR - Seasonal Residential
RT - Residential (20,000 to 40,000 sq. ft. min. lot size)
R1 - Residential (40,000 to 80,000 sq. ft. min. lot size)
R2 - Residential (80,000 sq. ft. to 5 acre min. lot size)
- 52 Project 80 Study Areas Code
0 - Not a Study Area
1 - Designated a Future Study Area
5 - Existing State Recreation Site
6 - Existing Federal Recreation Site
- 53 Blank
- 54 Forest Cover (Only for Parcels Coded Forested
Under Land Use Code)
1 - White, Red, Jack Pine
2 - Spruce - Fir
3 - Oak - Hickory
4 - Elm, Ash, Cottonwood
5 - Maple, Birch, Basswood
6 - Aspen - Birch
7 - Unproductive
8 - Reserved
9 - Non-Forested
- 55-61 Blank
- ***Note*** Data Acquired from DNR Land Classification is included for Relevant
Land Parcels (DNR and County Land)
- 62 Acquisition - From DNR Land Classification Data
0 - None Listed Below
1 - Trust Fund (School and Swamp)
2 - Acquired
3 - Consolidated Conservation
4 - L.U.P. (Leased)
5 - 50-50 Lands
6 - University
7 - Volstead
8 - Salt Springs
9 - Tax Forfeited

- 63-64 Ownership and Use - From DNR Land Classification Data
20 - Lands and Forestry State Forest
21 - Lands and Forestry Non-State Forest
30 - Game and Fish
32 - Law Enforcement
40 - Parks
50 - Highways
60 - Other State Agencies
70 - County Forests
71 - County Parks
72 - County Right-of-Way
73 - Other County Land
75 - Undivided Interest (County)
- 65 Mineral Status - From DNR Land Classification Data
1 - Taconite Lease
2 - Natural Iron Ore Lease
3 - Other Mineral Leases
4 - Mineral Potential
- 66 Accessibility - From DNR Land Classification Data
1 - On All-Weather Road
2 - Within 1 1/2 Miles of All-Weather Road
3 - Within 1 1/2 - 3 Miles of All-Weather Road
- Not Readily Reached by Land But:
4 - On Navigable Water (No Portage)
5 - On Navigable Water (Portage)
6 - Not Readily Accessible
7 - Not Accessible
- 67 County Zoning - From DNR Land Classification Data
0 - None Listed Below
1 - Residential
2 - Commercial
3 - Manufacturing, Light Industrial
4 - Manufacturing, Heavy Industrial
5 - Public (Parks, Recreational, Agricultural
and Forestry)
6 - Open Space
7 - Water Front Preserve
- 68-69 Recommended Use - From DNR Land Classification Data
1 - Urban Development
2 - Agricultural
3 - Agricultural (No Year Long Occupancy)
4 - Mining and Mining Facilities
5 - Recreational or Aesthetic
6 - Multiple-Use Forestry (Including Watershed)
7 - Game or Fish (Including Flowage)
8 - Commercial Pit or Gravel
9 - Access to Lake or Other Land

70 Recommended Disposition - From DNR Land Class. Data
1 - Retain Permanently (Conservation)
2 - Retain Permanently (Other)
3 - Retain Provisionally (Custodial)
4 - Dispose (By Sale)
5 - Exchange

76-77

Agricultural Suitability Score

78-79

Forest Suitability Score

80

Forest Productivity (Based on Soil Type)

71 Management Unit - From DNR Land Classification Data
0 - No Management Unit
1 - In Management Unit
2 - In Proposed Management Unit

72-73 Blank

74 Recommended Forest Specie (Based on Soil Type)
0 - Not Rated
1 - Red Pine
2 - Jack Pine
3 - White Spruce
4 - Tamarack
5 - Cedar
6 - Hardwoods
7 - Oak
8 - Aspen
9 - Black Spruce

75 Highway Orientation
1 - Four Lane Controlled Access or Interstate
2 - Four Lane Other
3 - Two Lane State and Federal
4 - Two Lane County Paved
5 - Unpaved

The following are intersections of the above
Five Categories:

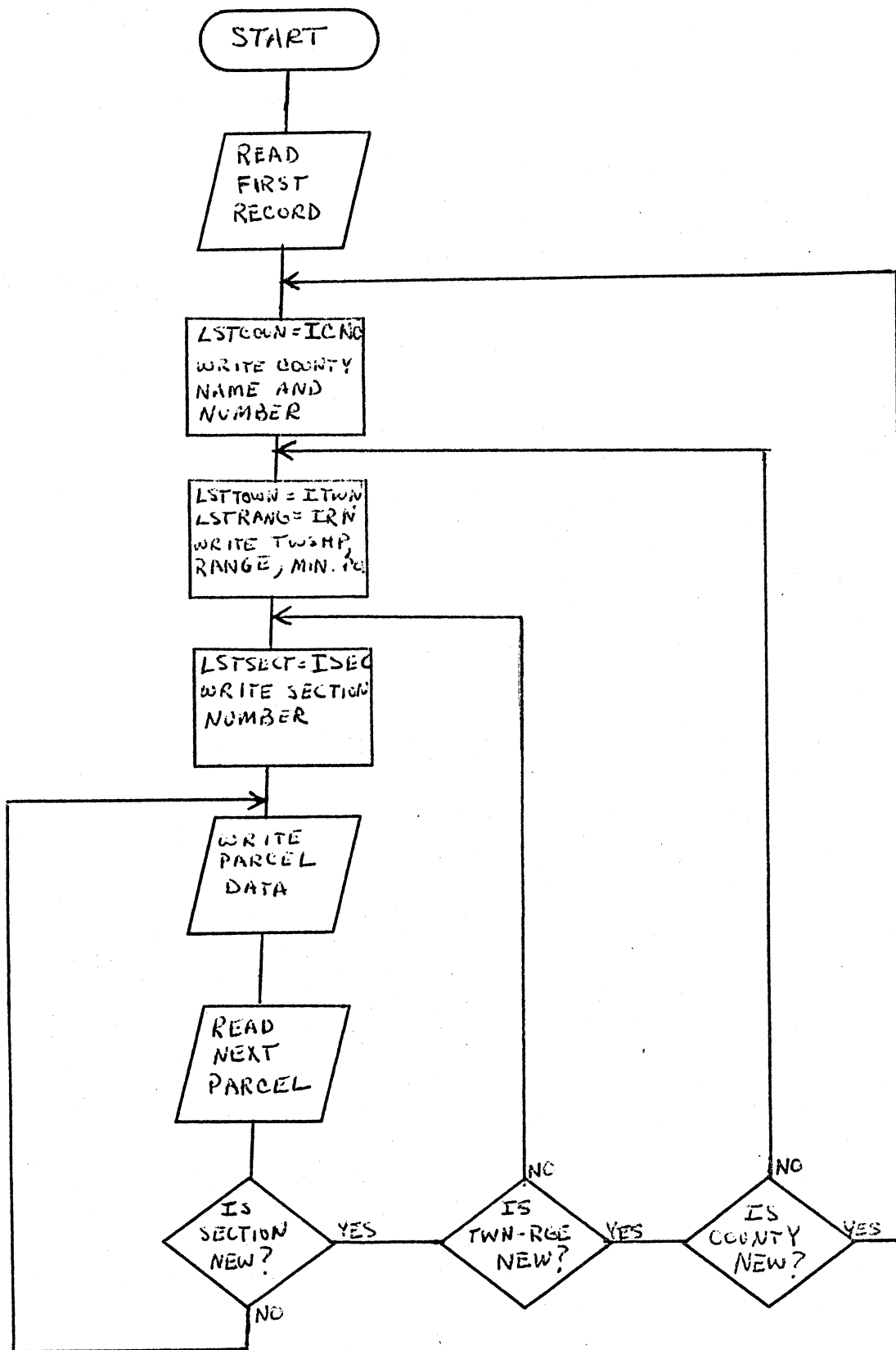
- A - 1,1 (Intersection of Two Category Ones)
- B - 1,2 (Intersection of a Category One and a Category Two)
- C - 2,2
- D - 1,3
- E - 2,3
- F - 3,3
- G - 1,4
- H - 2,4
- J - 3,4
- K - 4,4
- L - 1,5
- M - 2,5
- N - 3,5
- P - 4,5
- Q - 5,5

X - Represents Residential Streets

APPENDIX B

FLOWCHART AND LISTING OF PROGRAM TO CONVERT

MLMIS DATA TO SYSTEM 2000 DATA STRINGS



GENERAL FLOW CHART

```

400  WRITE (2,5)                                IQQ,IGVLT,IMCD60,
      1IMCD7,LNDCVR,IWO,IOWN,IREL,IS1,IS2,IS3,IS4,IGEOM,ILEG,ISCH,
      2IZON,IFBO,IFOR,IHO,ISPECF,IAGSUIT,IFRSUIT,IFRPROD
5    FORMAT(                                     7H 35*36*,A2,4H*37*,A2,4H*38*,A3,
      34H*39*,A3,4H*40*,/,A1,4H*41*,A1,4H*42*,A2,4H*43*,A1,5H*441*,A1,
      45H*442*,A1,5H*443*,A1,5H*444*,A1,4H*45*,A3,4H*46*,A3,4H*47*,A3,
      54H*48*,A2,4H*49*,A1,4H*50*, A1,/,4H*51*,A1,
      65H*511*,A1,5H*512*,A2,5H*513*,A2,5H*514*,A2,1H*)
C
C    TFST TO SEE IF THERE IS DNR DATA
C
C    IF(IACQ.EQ.1H0)GO TO 500
C
C    DNR DATA EXISTS SO WRITE IT ONTU DATA STRING
C
C    WRITE(2,6)                                IACQ, IUSE, IMINST, IACCFSS, ICTYZON,ICLAS,
      3IDIS, IMGMTU
6    FORMAT(                                     7H 52*53*,A1,4H*54*,A2,
      64H*55*,A1,4H*56*,A1,4H*57*,A1,4H*58*,A2,4H*59*,A1,4H*60*,A1,1H*)
C
C    NO DNR DATA EXISTS SO READ NEXT RECORD
C
C    500  READ(1,1) ICNO, ITWN, IRN, ISEC,IQQ,IGVLT,ICNEW,IMCD60,
      1IMCD7,LNDCVR,IWO,IOWN,IREL, IS1,IS2,IS3,IS4, IGEOM, ILEG, ISCH,
      2IMINP, IZON, IPRU, IFOR, IACQ, IUSE, IMINST, IACCESS, ICTYZON,
      3ICLAS, IDIS, IMGMTU, ISPECF,IHO,IAGSUIT,IFRSUIT,IFRPROD
C
C    TFST FOR END OF FILE
C
C    IF(EOF(1))600,601
C
C    NO END OF FILE SO CONTINUE
C
C    601  CONTINUE
C
C    INCREMENT COUNTER BY ONE AND TFST FOR MAXIMUM NUMBER OF RECORDS
C    TO BE PROCESSED
C
C    KOUNTER=KOUNTER+1
C    IF(KOUNTER.GT.6000) GO TO 600
C
C    TFST FOR A NEW SECTION--IF NONE ENCOUNTERED WRITE OUT PARCEL DATA
C    AND READ ANOTHER RECORD
C
C    IF(ISEC.EQ.LSTSECT)GO TO 400
C
C    SECTION NUMBERS CHANGED SO SEE IF A NEW TWSHP-RANGE HAS BEEN
C    ENCOUNTERED
C
C    IF TWSHP-RANGE IS THE SAME GO UP AND RESET LAST SECTION ENCOUNTERED
C    AND WRITE OUT SECTION AND PARCEL DATA
C
C    IF(1TWN.EQ.LSTTOWN.AND.IRN.EQ.LSTRANG)GO TO 300
C
C    IF NEW TOWNSHIP-RANGE IS ENCOUNTERED, TEST TO SEE IF WE HAVE A

```



```
C      NEW COUNTY
C
C
C      IF NO NEW COUNTY IS ENCOUNTERED RESET THE LAST TOWNSHIP-RANGE
C      ENCOUNTERED AND WRITE OUT TOWNSHIP, RANGE, MINERAL POTENTIAL,
C      SECTION, AND PARCEL DATA
C
C      IF (ICNO.EQ.LSTCOUN)GO TO 200
C
C      IF A NEW COUNTY NUMBER IS ENCOUNTERED WRITE END# OF DATA STRING
C      AND WRITE OUT COUNTY, TOWNSHIP,RANGE, MIN POTENTIAL, SECTION,
C      AND PARCEL DATA
C
C      WRITE(2,7)
7      FORMAT(1X,4#END#)
C      GO TO 100
C
C      IF NO NEW COUNTY, WRITE OUT LAST END**
C
600   WRITE(2,8)
8      FORMAT(6# END**)
C      STOP
C      END
```


APPENDIX C

LISTINGS OF PROGRAMS TO TRANSFER DATA
BASE FILES FROM CDC CYBER 74 TO CDC 6400

APPENDIX C - PAGE 1

```

KAK,CM45000,T30.44976111
BIN,WB,0121.
PASSWORD=
S2000,TP.
SEND,TAPE999=TAPE999/UN=,PW=,D.
>
USER,:
DATA BASE NAME IS UCC102NINER:
CONTROL:
SAVE DATA BASE ON TAPE999:
EXIT:
;

```

listing of transfer program to
send file from CYBER 74 to CDC 6400

```

07/24/74 UCC - UNIVERSITY OF MINNESOTA (30APR74) MOPS 1.0.
13.18.59.KAKWBTM
13.18.59.KAK,CM45000,T30.44976111
13.19.00.BIN,WB,0121.
13.19.00.S2000,TP.
13.19.06. COPYBR,TATABLE,TAPE999.
13.19.07. COPYBR,TBTABLE,TAPE999.
13.19.09. COPYBR,ICTABLE,TAPE999.
13.19.10. COPYBR,TDTABLE,TAPE999.
13.19.15. COPYBR,TETABLE,TAPE999.
13.19.17. COPYBR,TFTABLE,TAPE999.
13.19.20.STOP S2K
13.19.20.SEND,TAPE999=TAPE999/UN=***,PW=***,D.
13.19.20.
13.19.21. GFM - RESERVED FILE NAME VALIDUS.
13.19.22. FILE SENT TO 6400 TAPE999
13.19.22.
13.19.22. CPU SEC. PPU SEC. ECS SEC.
13.19.23. 0.159 17.001 0.175
13.19.23.
13.19.23. CPU CHG. PPU CHG. ECS CHG.
13.19.23. $ 0.02 + 0.35 + 0.02 = $ 0.39
KAKWBTM //// END OF LIST /000003 PAGES

```

execution of above program

APPENDIX C - PAGE 2

```
BATCH,44000  
ATTACH,S2000/UN=UCC6011  
ATTACH,TAPE999  
S2000,TP  
USER,FOLKS:  
LOAD UCC102NINER FROM TAPE999:  
EXIT:
```

Commands above are issued from a computer terminal while on the MERITSS System.

The commands establish and save the data base on the CDC 6400.