

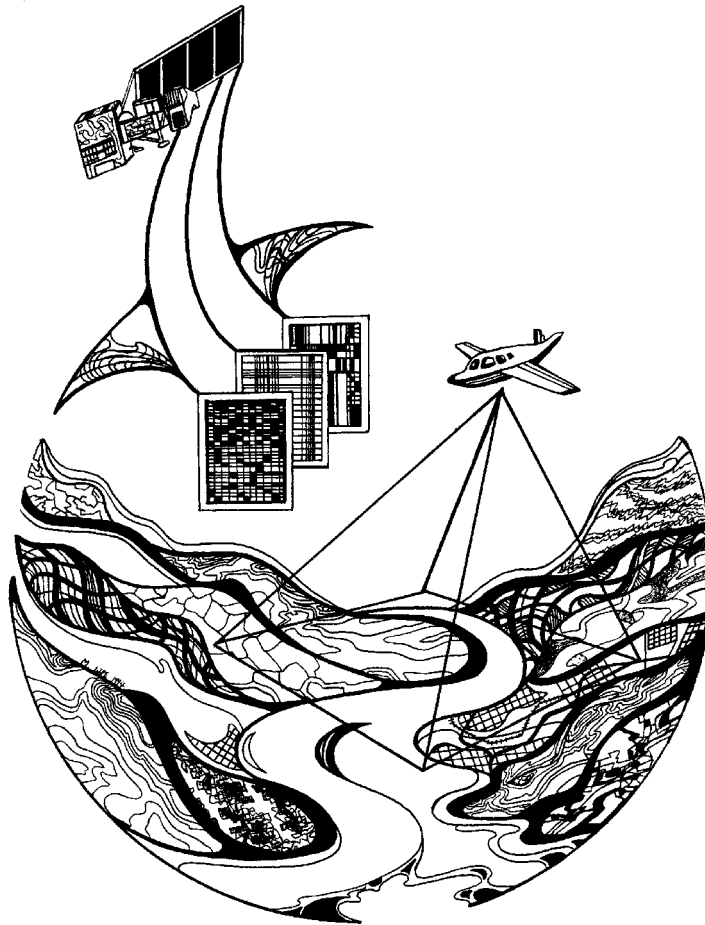
Long Term Resource Monitoring Program

Program Report

95-P008-3

Long Term Resource Monitoring Program
Standard Operating Procedures:

Production ARCEDIT Digitizing



August 1995

**Long Term Resource Monitoring Program
Standard Operating Procedures:
Production ARCEDIT Digitizing**

by

Lynne Arndt
St. Mary's University of Minnesota
700 Terrace Heights
Winona, Minnesota 55987-1399

and

Douglas A. Olsen
National Biological Service
Environmental Management Technical Center
575 Lester Avenue
Onlaska, Wisconsin 54650

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stewardship of the Nation's natural resources.*

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Preface

The Long Term Resource Monitoring Program (LTRMP) was authorized under the Water Resources Development Act of 1986 (Public Law 99-662) as an element of the U.S. Army Corps of Engineers' Environmental Management Program. The LTRMP is being implemented by the Environmental Management Technical Center, an office of the National Biological Service, in cooperation with the five Upper Mississippi River System (UMRS), States of Illinois, Iowa, Minnesota, Missouri, and Wisconsin, with guidance and Program responsibility provided by the U.S. Army Corps of Engineers. The UMRS encompasses the commercially navigable reaches of the Upper Mississippi River, as well as the Illinois River and navigable portions of the Kaskaskia, Black, St. Croix, and Minnesota Rivers.

The mission of the LTRMP is to provide decision makers with information to maintain the UMRS as a sustainable large river ecosystem given its multiple-use character. The long-term goals of the Program are to understand the system, determine resource trends and impacts, develop management alternatives, manage information, and develop useful products.

The strategy to develop and adopt standard operating procedures is included in the LTRMP Operating Plan as Strategy 4.1.1, *Develop and Update Information Management Guidance Documents* under Objective 4.1, *Provide Direction for Automation Activities*. This report was developed with funding provided by the Long Term Resource Monitoring Program.

Additional copies of this report may be obtained from the National Technical Information Service, 5285 Port Royal Road, Springfield, Virginia 22161 (1-800-553-6847 or 703-487-4650).

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Introduction

These procedures were developed to be used with the Unix-based ARC/INFO Production ARCEDIT (PAE) (Olsen 1993R). The PAE system is a custom user interface designed to standardize the procedures and commands available in the ARCEDIT module. Tolerances are automatically set based upon the scale of the source material.

Project Assignment and Preliminary Quality Control

1. Obtain maps and/or overlays from the supervisor for the project/theme assigned and review the Digitizing Assignment Sheet (Appendix A) for detailed instructions, naming conventions, attributes, etc. The supervisor assigns project, themes, and maps to be digitized, sets job priorities, and determines the order of maps and/or overlays to be digitized in each theme. Depending on the source of the data, such as vector data (points, lines, or polygons) or zoom transfer data, you will need to follow the corresponding procedures. If you will be editing zoom transfer data, refer to Appendix B for instructions and use the Zoom Transfer Scope (ZTS) Information Sheet (Appendix C).
2. Check the base maps and/or overlays with all adjacent maps/overlays for unlabeled polygons, missing arcs, and inconsistent attributes or line work between map edges. The supervisor will assist you in organizing the project.
3. Fill out a Map Information Sheet (Appendix D) for each coverage to be digitized in the assigned theme. Obtain project/theme names and base map projection information from the supervisor and the project assignment sheet. Refer to Theme Abbreviations Code List (Appendix E) for the current list of theme names and standard abbreviations. New theme name abbreviations must be approved by the supervisor.
4. In the Geographic Information Systems (GIS) lab, the Data Tracking Sheet (Appendix F) will be printed on the back of the Map Information Sheet (Appendix D). Enter the initial coverage name under the "coverage" column of the Data Tracking Sheet. Use the coverage naming conventions described in the Coverage Naming Standards (Appendix G). Use the Project Code List and Projection Code List (Appendix H) for naming convention abbreviations.

Creating a Workspace

The supervisor will help you create a workspace or working directory and necessary subdirectories for each project. A *readme* file will also be created in the working directory in TEXTEDITOR, which is a Windows-based X View application used for editing text files. A text editor can be opened by typing *textedit &* at the Sun% prompt. This file will contain the work request number of the project, a description of the project, and any special instructions that are included with the project. After this file is created, you can start creating coverages.

Before logging out, delete extraneous files and add new information to your *readme* file if necessary. Each new file, coverage, or other miscellaneous information should be listed with a brief explanation. For example: lcu89p14_prj--projected coverage.

If you need to delete unnecessary coverages, **do not** use system commands; use the ARC command *KILL* to delete the coverages. Keep all coverages from previous operations until you are sure they are not required for archiving (check with supervisor).

Creating a Coverage

1. If the map sheet is a standard U.S. Geological Survey (USGS) quad, or any rectangular map with lat/long intersections on the corners, the initial coverage will be created using the QUADMAP option in the Production ARC Application. Ask your supervisor if you have any questions. See Appendix I for instructions for creating a quadmap.
2. If the map sheet is not a standard USGS quad and is not rectangular with lat/long intersections on the corners, identify tics by labeling each one (four minimum) and use the CREATE option from the Production ARCEdit **COVERAGE** menu. Be sure to consult with the supervisor before creating a new coverage by this method. Also, if no projection information is given on the map sheet, always digitize at a 1:1 scale in map unit inches. Refer to Appendix J for instructions for creating a new coverage.

Map Registration

The next step is to register your coverage. PAE requires you to register the coverage through the **MAP REGISTRATION** menu. Registration ensures that the initial tic locations were digitized accurately. When registering through the **MAP REGISTRATION** menu, if you cannot get the Root Mean Square (RMS) error below the required tolerance (0.005), the original tic locations were probably digitized poorly, and the coverage should be recreated. If this occurs, please notify the supervisor.

1. Choose **MAP REGISTRATION** from the main menu bar.
2. **MAP REGISTRATION** will prompt you for a digitizer type. The upper corner of the digitizing table will indicate the type of digitizer: Calcomp, Altek, or Altek-quad.
3. Next, you will be prompted to enter at least four tic locations from the digitizer. Use the tic entry procedure from Appendix J. To enter the tics, start with the upper left-hand corner and proceed clockwise. After entering the tic locations, the RMS error is displayed. The (dig) RMS error must be 0.005 or less. If it is not, you should reregister the coverage. Please notify the supervisor if reregistration fails.
4. At this point, the coverage is created, registered, and ready for digitizing.

Digitizing with PAE

If you are digitizing an existing coverage, select the **CHOOSE EDIT COVERAGE** option from the **COVERAGE** menu. After you select the coverage to be digitized, choose **MAP REGISTRATION** and use the tic entry procedure from Appendix J to register your map. Once the map is registered with an RMS error less than 0.005, it is ready to be digitized. If you are digitizing line features such as contours, refer to Appendix K.

1. From the main menu, choose the **EDIT** option; this will bring up another submenu, which will be the basic menu you use when digitizing. For more information on this process, refer to the Production ARCEDIT document (Olsen 1993R).
2. Before adding features, you must go into the **INPUT** option of the **EDIT** menu and select *FROM DIGITIZER*.
3. From the same menu, choose the **ADD** option, which will put you in digitizing mode. Begin digitizing from the keypad, using the "2" button for a node to start and end an arc and a "1" button for vertices. Option 9 (quit) returns you to the **EDIT** menu. If any abnormal problems with the software, hardware, or maps occur during digitizing, inform the supervisor immediately.
4. The supervisor is responsible for coordinating all cartographic questions and problems with in-house GIS personnel or off-site contact persons. Following the instructions provided by the supervisor, identify data discrepancies and cartographic questions on the base maps or map overlays.
5. Select the **SAVE** option periodically (every 15 min) during the digitizing session and following completion of digitizing.

Verification

When you have completed your line work, make a check plot for the supervisor to check. This can be created by choosing the **CHECKPLOT** option from the **PARC** main menu. This option will make the plot and send it to the penplotter.

First, compare the plot to the map by overlaying both on the light table. After you initially check your plot, the supervisor must check it and sign the Map Information Sheet. If changes need to be made, the supervisor will inform you. Follow the digitizing procedures to add the features. Then before continuing, have the supervisor do a final check.

Topology/Editing

1. From the **PARC** main menu choose the **TOPOLOGY** option and then choose *CLEAN*. Fill in the appropriate information in the form menu. For output coverage name, use the original coverage name and then add *_c* (i.e.: *bro_dig* to *bro_c*). The original coverage will remain uncleaned and a copy will be created with the new name. Save all intermediate coverages. After choosing **APPLY** on the **CLEAN** menu, the system will show the chosen setting and ask if they are correct. If the settings are OK, then type *y* to accept the settings and the coverage will be cleaned. If you are

digitizing with tolerances of scale 1:1 in unit inches, use the scale 1:6,000 to clean. From this point on, the cleaned coverage (bro_c) will be the one which is further processed.

Note: the CLEAN option is used only once per coverage. If any edits are made to the coverage, use the BUILD option to rebuild topology.

2. From the **PARC** main menu, choose the ERRORS option and then choose *NODEERRORS*. This will tell you if you have any dangling nodes such as undershoots or overshoots. If no dangles exist, proceed to ATTRIBUTING.
3. If dangles are present, go into the **PAE** main menu and select COVERAGE and select the CHOOSE EDIT COVERAGE option. Select the cleaned coverage to be edited and set the tolerances for that coverage. Most dangles can be fixed by either deleting an overshoot or moving the node of an undershoot. To draw your dangles, go into the **DRAW** option and then select the DRAW SETTINGS option. Click on *DANGLING NODES* and then *DRAW*. A red box will be drawn around the dangles.
 - a. If there is an overshoot, select EDITFEATURE as arc. Select the EDIT option. From the **EDIT** menu choose the SELECT option. A submenu will pop up and you will select your extended arc through this menu by clicking on *SELECT*. After you have selected the arc, delete it.
 - b. If there is an undershoot, choose the MOVE NODES option from the EDIT submenu. Once you click on this option, it will prompt you to select the node you want to move. Use the left mouse button to select it. If the correct node is NOT selected, use the middle mouse button to move to the next node until the correct one is selected.

Once the correct node to move is selected, a 4 (press shift and left mouse button) will move the node. The cmdtool window will then prompt you to point and click with the left mouse button in the general area where you want the node moved. Usually, you want to snap the node to another existing node, as this will remove the dangle.
 - c. If there is a dangle near an arc where a node does not exist, you can create a node to snap to. First, make your edit feature arc. Then select the arc that you want to create a node with. On the EDIT menu choose the OTHER option and select *SPLIT*. *SPLIT* creates a node by splitting one arc into two separate arcs. Click on the selected arc where you want to create the new node. Now you can use this node to snap to for dangles.
4. When editing is complete and saved, go back into **PARC**. Choose the TOPOLOGY option and then select *BUILD*. This step will rebuild topology following any edit changes. After building, select the ERRORS option and check for *NODEERRORS* once again to make sure no other corrections need to be made.

Attributing

Label points are created only for polygon coverages. Label points are not created for point or linear coverages since attribute information is directly associated with individual point and linear features.

1. From the **PARC** main menu choose the CREATE LABELS option to create polygon labels for a coverage. A "user-id" number will be given to each label point created. Labels can be added to coverages which already have some labels by specifying an "id base." The "id base" is the starting number for labeling the additional polygons. The default "id base" of 0 creates polygon labels for all polygons in a coverage. If you are creating labels for a coverage for the first time, leave the default "id base" at 0 and apply. If you are adding labels to a coverage that already contains labels, the "id base" must be greater than the highest numbered label point.
2. After creating polygon labels, a coverage **must** be built. Choose TOPOLOGY and the BUILD option from the **PARC** main menu to rebuild coverage topology.
3. Before attribute information can be added to a coverage, the item to hold the attribute information must be defined and added to the coverage attribute table. To add an item to a coverage attribute table, choose ITEM from the **PARC** main menu, then choose the ADD ITEM option. Fill in the form menu with the appropriate information specified on the project assignment sheet or provided by supervisor. After choosing APPLY from the **ADD ITEM** menu, the system will show the chosen settings and ask if they are correct. If the settings are correct, then type y to accept them and the item will be added to the attribute table.
4. Attribute information is added to the coverage attribute table through PAE. After choosing the edit coverage, select the appropriate edit feature. Make sure the edit feature is "label" and that the labels are drawn for you to attribute. From the EDIT menu, choose the ATTRIBUTE option, then choose *UPDATE SELECTED RECORDS*. A menu will pop up showing the first record of the selected set. Click on the *FIRST* button to highlight the first label selected in yellow. Add the appropriate attribute information to the selected record, then choose *NEXT* to move to the next record in the selected set. Refer to the project assignment sheet and basemap or map overlay for the codes to be entered. Be sure to save periodically.
5. From the **EDIT** menu, choose the ATTRIBUTE option, then the LIST ATTRIBUTE TABLE option. This will list the coverages attribute table in a scrollable window. Scroll through the attribute table to ensure that each label point has correct and complete attribute information assigned. Once all attribute information is entered, you must build the coverage before creating the area report.
6. When you have completed attributing, select the REPORT option from the **PARC** main menu. This will provide a text file report of the attributes and corresponding acreages. Name the report the name of the coverage.rpt (e.g., Brownsville quad, report name is bro_c.rpt). Make a report for each of the items that you added. To print the file, at the sun prompt type: lp -d south4si <file name> (ie bro_c.rpt). Check the summary for any misspelled or incorrect attributes.

Final Quality Control

To QC the attributes, create a check plot with the arcs and attributes listed. Choose the CHECK PLOT option from the **PARC** main menu. Return base maps and/or map overlay(s) to the supervisor to check your work. If changes need to be made, the supervisor will inform you. Once everything is in order, finish your READ_ME file and let the supervisor know that your directory is in order. The project will then be turned over to the supervisor.

Archiving

Once you have completed your part of a project, it may be archived. Inform your supervisor that your project directory is ready to archive.

References

- Olsen, D. A. 1995. Geospatial Application: Production ARCEDIT. National Biological Service, Environmental Management Technical Center, Onalaska, Wisconsin, Revised July 1995. EMTC 93-P005R. 10 pp. + Appendix A + diskette.
- U.S. Fish and Wildlife Service. 1992. Operating Plan for the Upper Mississippi River System Long Term Resource Monitoring Program. Environmental Management Technical Center, Onalaska, Wisconsin, Revised September 1993. EMTC 91-P002. 179 pp. (NTIS #PB94-160199)

Appendix A

Digitizing Assignment Sheet

EMTC Task Number: _____ Location: _____
Project Name: _____ Abbreviation: _____
Data Type: _____ No. Maps in Project: _____
Data Theme: _____ Theme Abbreviation: _____
Map Scale: _____ Coincident Lines: _____

Items Attribute Codes

Item Name: _____
Item Width: _____ Item Type: _____
(C=Character, I=Integer)

Special Instructions:

Map Edges Checked By: _____ Map Type(s): _____
Refer Carto Questions To: _____ Data Vintage: _____
Return Maps To: _____ Map Vintage: _____
Date Source Material Returned: _____ Supervisor Initial: _____
No. Maps Assigned: _____ Date: _____
Deadline Date: _____ Time Estimate: _____
Signed: _____ Date: _____

Appendix B

Editing Zoom Transfer Data

1. You will be provided a Stereo Zoom Transfer Scope (ZTS) Information Sheet for each project. You are required to complete the EDITING box. Enter your name on the EDITOR line, enter the date on the DATE line, and enter the full pathname to your workspace where the project directory will reside on the LOCATION line under EDITING. The TRACKING lines should be filled out with the date and any step to the project that you complete.

Example:

9/28/94 Copied directory

9/28/94 Ran AUTOTRANSFER.AML on subdirectories xy1 to create lcu89p8_1

9/28/94 Ran AUTOTRANSFER.AML on subdirectories xy2 to create lcu89p8_r

9/29/94 Appended lcu89p8_r and lcu89p8_1 together to create lcu89p8

2. From the digitizing box, retrieve the pathname for the directory with the project files from the Stereo ZTS Information Sheet on the LOCATION line. The name of the directory you copy will be found on the DIRECTORY NAME line. Copy that directory to your workspace using the same name as on the DIRECTORY NAME line.

Example: sun03% cp -r /net/suns02/home/lrr0/lcu89p8.

The Unix command for copying files is *cp*. The *-r* allows you to copy a directory. The dot "." at the end of the line tells the computer to copy the directory to your present workspace and to give the same directory name to the newly copied directory.

3. Compare the subdirectories on the Unix to ensure that all of the coverages in each subdirectory match the x, y shift listed on the ZTS Information Sheet. (Note: You can do this from either the Unix prompt or the ARC prompt. If you check the directory from the Unix prompt, you will want the Unix *cd* command to change directories and the *ls* command to list the files in the directory.)

Example:

```
sun02% cd <directory name>
```

This will move you into a directory.

```
--or-- sun02% cd ..
```

This will move you up one directory level.

```
--then-- sun02% ls
```

This will list the files in your present directory.

--or-- You can use the ARC command *w* at the ARC prompt to change workspaces (this is like changing directories) and the *lc* command to list just the coverages in the directory, or you can also use the Unix *ls* command at the ARC prompt to list all the files in the directory.

Example:

```
arc: w <directory name>
```

This will move you into the directory.

--or-- arc: w ..

This will move you up one directory level.

--then-- arc: lc

This lists all of the coverages in the directory.

--or-- arc: ls

This will list the files in your present directory.

4. If the directories are in order, then change your working directory to the directory or one of the subdirectories with the "ph" coverages and then run the AUTOTRANSFER.AML. (Note: "PH" is the prefix of the naming convention used to name the coverages.) To run the AUTOTRANSFER.AML, simply type autotransfer at the ARC prompt. If the project contains subdirectories, then when the AUTOTRANSFER.AML prompts you for the OUTPUT NAME, type in the path or LOCATION with the DIRECTORY NAME and the name of the new coverage to be created.

Example:

```
Output name: /net/sun02/home/abc0/lcu89p8/lcu89p8_r
```

If there is more than one x, y shift, you must denote the coverage to be created by attaching a suffix such as *_l* if the coverage makes up the left side of the final coverage, or *_r* if it makes up the right side of the coverage, and *_d* if there is only one x, y shift. These coverages will be equivalent to the "raw" digitized coverages of manual digitizing.

5. If the project consists of subdirectories with different x, y shifts, then use step 4 for each of the directories.
6. After all of the of the "ph" coverages have been joined by the AUTOTRANSFER.AML, change your workspace to the location where all the newly created ("raw") coverages are and append them together at the arc prompt.

Example:

arc: append lcu89p8

Enter the first coverage: lcu89p8_r

Enter the second coverage: lcu89p8_1

Enter the third coverage: {enter a hard return}

Done entering coverage names (Y/N)? Y

Do you wish to use the above coverages (Y/N)?Y

7. Proceed to Editing with PAE standard operating procedures.

Appendix C

Stereo Zoom Transfer Scope Information Sheet

Project Name: _____

<u>Digitizing</u>				
Directory Name _____		Date _____		
Shift/Dataset Name _____		Theme _____		
Location _____		Digitizer _____		
Shift X = _____		Y = _____	Page _____	of _____
Photo #	X	<u>Photo Residuals</u>		Total
		Y	Z	
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____

<u>Editing</u>		
Editor _____	Date _____	
Location _____	Data Type: Poly _____ Line _____ Point _____	
<u>Tracking</u>		
_____	_____	
_____	_____	
_____	_____	
_____	_____	

<u>Quality Control</u>		
Total # Arcs _____	Total # Polygons _____	Total Attributes _____
Fuzzy Tolerance _____	Node Err Fixed _____	Label Errors Fixed _____
Date Map Completed _____	Line Plot QC'D _____	Attributes QC'D _____
QC Supervisor _____	Total Hours to Complete _____	

Appendix D

Map Information Sheet

Coverage Name: _____ Date: _____
Project Name: _____ Digitizer: _____
Location: _____ Mapsheet Scale: _____
Mapsheet Name: _____ Data Type: _____
Mapsheet Vintage: _____ Data Type: poly line point
Theme Name: _____ Projection: _____

TIC ID# _____ (lon) _____	TIC ID# _____ (lon) _____
(lat) _____	(lat) _____
TIC ID# _____ (lon) _____	TIC ID# _____ (lon) _____
(lat) _____	(lat) _____
TIC ID# _____ (lon) _____	TIC ID# _____ (lon) _____
(lat) _____	(lat) _____

RMS Error: _____

Coordinates of Quad Center (lon/lat): _____ . _____ . _____ . _____ . _____

Adjacent Completed Maps:	Edge Snap:	Total # Attributes: _____
North _____	_____	Total # ARCS: _____
East _____	_____	Total # Polygons: _____
South _____	_____	Fuzzy TOL: _____ Dangle: _____
West _____	_____	Node Errors Fixed: _____
Date Map Completed: _____		Label Errors Fixed: _____
Date Line Plot Checked: _____		Supervisor Initial: _____
Date Attributes Checked: _____		Supervisor Initial: _____
Total Hours to Complete: _____		Supervisor Initial: _____

Appendix E

Theme Abbreviations Code List

<u>Theme abbrev.</u>	<u>Theme name</u>	<u>Theme abbrev.</u>	<u>Theme name</u>
AMB	Administrative Boundary	NST	Nest Sites
AQA	Aquatic Areas	PBD	Pasture Boundary
ARC	Archaeological Sites	PTC	Photo Centers
ASB	Assessment Area Boundary	PTL	Pipes/Transmission Lines
CAN	Canals	PCS	Plant Communities
CEN	Census	PLV	Pool Level
CTY	County Boundary	POU	Pool Outline
CUL	Cultivated Boundary	POL	Political Boundary
DEM	Digital Elevation Models (DEMs)	PSS	Potential Spill Source
ARH	Architectural	PLC	Powerline Corridor
DLG	Digital Line Graphs (DLGs)	PRE	Precipitation
DIC	Dikes/Canals	PRZ	Precipitation Zones
DRN	Drainage	PVL	Private Lands
ESS	Environmentally Sensitive Areas	PLS	Public Land Survey
ESC	Escarments	RRS	Railroads
FED	Federal Lands	RBD	Refuge Boundary
FLT	Flight Lines	RFP	Refuges, Fish Hatcheries, and Game Preserves
FEV	Flood Event	RVB	Reservation Boundary
FPB	Floodplain Boundary	RIP	Riparian
FPL	Floodplain Level	RIV	River
FBD	Forest Boundary	RCA	River/Canals
FMA	Forest Management Area	RIC	River Channel
GEO	Geology	RDS	Roads
HAB	Habitat	SAT	Satellite
HLW	High-low Water Line	SLO	Slope
HWL	High Water Line	SLS	Soils
HYD	Hydrography	SPG	Springs
IRL	Irrigated Land	SPT	Springs, Water Tanks, and Stock Tanks
LEL	Lake Elevations	SBD	State Boundary
LAM	Lakes/Marshes	STR	Streams and Rivers
LAK	Lakes/Ponds and Reservoirs	STC	Structures
LAQ	Land Acquisition	SAB	Study Area Boundary
LCU	Land Cover/Land Use	SCT	Surface Cover Types
LAN	Landforms	SMA	Swamp/Marsh
LND	Landings	TER	Terrain Features
LST	Land Ownership	TCK	Tic Marks
LTK	Land Tracts	TMH	Timber Harvest
LUS	Land Use	TMB	Timber Stands
LWA	Land/Water	TTY	Timber Types
MGT	Management Areas	TOW	Towers
MIG	Migratory Birds	TWN	Towns and Cities
MIN	Minerals	TRL	Trails

<u>Theme abbrev.</u>	<u>Theme name</u>
TRN	Transects
TRA	Transportation
UPL	Uplands
UPP	Upland Potential
VEG	Vegetation
VEM	Vegetation Mortality
VPT	View Points
VQO	Visual Quality Objectives
WCF	Water Control Features
WCV	Water Conveyance
WAF	Water Features
WIN	Water Intakes
WLV	Water Level
WWV	Water Wave and Velocity
WTD	Watersheds
WET	Wetlands
WDB	Wilderness Boundary
WLD	Wildlife Areas
WRZ	Winter Range Zone
ZON	Zoning
BTH	Bathymetry
BAC	Boat Access Points
SCE	Spill Containment Equipment
LDM	Lock and Dam
VAR	Various/Multitude
CON	Contour Lines
BEA	Beaches
SAM	Sample Points

Appendix F

Data Tracking Sheet

COVERAGE NAME	OPERATION PERFORMED	DATE

Appendix G

Coverage Naming Standards

/ / / / / / / / / / / / / / / / / /
Theme Year or project Data type Projection

Theme: Use abbreviated code from the Abbreviation Code List for first three spaces.

Year: This is the year of the source data and/or a project code name. Up to six spaces for this code can be used.

NOTE: If the coverage is based on an individual U.S. Geological Survey quadrangle, the Year or project field can be used to indicate the quad name. Use the first four letters of the quad name. If another quad has the same four letters, use the first three letters, followed by the fifth. If quad name is repeated with a direction, use the first two or three letters and direction (i.e., SLNW for northwest or FORW for west).

Data Type: Leave space blank when data are polygon type (default), or use a dot symbol (.) if a projection is included. Use "P" for point type and "L" for line type.

Projection: Leave space blank for Universal Transverse Mercator (UTM) (default). For other projections, use codes from Projection Code List.

Example: A polygon coverage of land cover/land use for Pool 4 developed in 1989 with a UTM projection: LCU89P4

Appendix H

Project Code List

P# = Pool #
WB = Weaver Bottoms
GR = Green Survey
BR = Brown Survey
OR = Open River
LAG = La Grange

Projection Code List

Default = Universal Transverse Mercator (UTM)
A = Albers Conic Equal Area
B = Lambert Azimuthal Equal Area
C = Polyconic
D = Van Der Grinden I
E = Equidistant
G = Geographic
I = Equirectangular
L = Lambert Conformal Curve
M = Mercator
N = Gnomonic
O = Orthographic
P = Polar Stereographic
Q = Oblique Mercator
R = Stereographic
S = State Plane
T = Transverse Mercator
U = Sinusoidal
V = Vertical Near Side Perspective
Y = Miller Cylindrical
Z = Azimuthal Equidistant

Appendix I

Creating a Quadmap

1. From the sun prompt, type *arc*.
2. Once in ARC, type *ARCMENU* to start the Spatial Data Management System.
3. When the menu bar appears, click on the **PARC** icon.
4. Once in the Production Arc application, click on the **Quadmap** menu option. Provide the following information:

Enter the lat/long tics following the example given.

Enter the utm zone (which will always be 15, unless indicated otherwise.)

Enter the output coverage name. The naming convention for an original digitized quad coverage is the first three letters of the quad name underscore dig. For example: Quad name is Brownsville. Naming convention would be BRO_DIG.

Click on the **Apply** button to create quad coverage.

You have created a new coverage, but it is not yet registered. Refer to **D. Map Registration**.

When you register your coverage, start with the upper left-hand corner as the first tic and proceed clockwise.

Appendix J

Creating a New Coverage

1. Type *parc* at the arc: prompt to launch the Production Arc Application.
2. Under the **COVERAGE** menu, choose CREATE.
3. Enter the name of your new coverage based on naming conventions. If you are entering new tics, proceed by entering from the keypad. Place the crosshairs directly over the center of the tic location and enter the following:

First tic: 1 A 1

Second tic: 2 A 1

Third tic: 3 A 1

Fourth tic: 4 A 1

. . . etc. You must have at least 4 tics.

This is actually a two-step process. The first two items entered represent the tic-id number. The last "1" entered registers that tic location.

After entering the last tic, enter *0 A* to exit.

You are then prompted to enter the initial boundary for this new coverage. Use the number 1 key on the digitizer keypad to enter the upper right coverage boundary and the lower left coverage boundary. Make sure to enter a boundary that completely encompasses the map you are digitizing.

Next, enter the scale of the map and the map units at which you will be digitizing. If the map has no projection information, use a scale of 1:1 with map units inches.

You have now created a new coverage and defined its tics, the coverage is not registered at this point. Proceed to the original SOP and follow map registration procedures.

Appendix K

Digitizing Contours or Other Linear Features

Digitizing linear features, such as contour lines, require different procedures than digitizing polygon data. Once your coverage has been created or selected and registered, follow these procedures.

1. Select the EDIT option from the main menu. Make sure your edit feature is arc. Choose the INPUT option and select *FROM DIGITIZER*.
2. Select the ADD ARCS option. This will put you in a text-based menu in the cmdtool window. Use the options to add and attribute the linear data.

From the digitizing keypad:

- a.
Select 8> digitizing options.
 - b.
Select 3> auto increment **OFF** (do this only once)
 - c.
Select 8> digitizing options.
 - d.
Select 1> new user-id; from the keypad enter the number (which is the features attribute) of the contour or other linear you are digitizing and press **A** to enter it.
3. Begin digitizing the linears with that attribute. When you want to change the user-id to digitize the other linears, repeat steps 2c and 2d. Remember to save every 15-20 min.

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13. ABSTRACT (Maximum 200 words) This chapter describes the procedures for digital data entry to be used by the staff at the Environmental Management Technical Center. Included are procedures for creating a coverage, registering a base map, digitizing with an automated program (Production ARCEDIT), generating topology for a coverage, and attributing. The two main issues during this procedure are digitizing error and quality control. The Appendixes contain forms and other information needed for the digital data entry procedure.			
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The Long Term Resource Monitoring Program (LTRMP) for the Upper Mississippi River System was authorized under the Water Resources Development Act of 1986 as an element of the Environmental Management Program. The mission of the LTRMP is to provide river managers with information to maintain the Upper Mississippi River System as a sustainable large river ecosystem given its multiple-use character. The LTRMP is a cooperative effort by the National Biological Service, the U.S. Army Corps of Engineers, and the States of Illinois, Iowa, Minnesota, Missouri, and Wisconsin.

