
Introduction to Seismic Data Loading and Management in the Landmark[®] Environment

Volume 4

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3D Drill View, 3D Drill View KM, 3D Surveillance, 3DFS, 3DView, Active Field Surveillance, Active Reservoir Surveillance, Adaptive Mesh Refining, ADC, Advanced Data Transfer, Analysis Model Layering, ARIES, ARIES DecisionSuite, Asset Data Mining, Asset Decision Solutions, Asset Development Center, Asset Development Centre, Asset Journal, Asset Performance, AssetConnect, AssetConnect Enterprise, AssetConnect Enterprise Express, AssetConnect Expert, AssetDirector, AssetJournal, AssetLink, AssetLink Advisor, AssetLink Director, AssetLink Observer, AssetObserver, AssetObserver Advisor, AssetOptimizer, AssetPlanner, AssetPredictor, AssetSolver, AssetSolver Online, AssetView, AssetView 2D, AssetView 3D, Barrier Assurance Monitoring, BLITZPAK, CartoSnap, CasingLife, CasingSeat, CDS Connect, CGMage Builder, Channel Trim, COMPASS, Contract Generation, Corporate Data Archiver, Corporate Data Store, Data Analyzer, DataManager, DataServer, DataStar, DataVera, DBPlot, Decision Management System, DecisionSpace, DecisionSpace 3D Drill View, DecisionSpace 3D Drill View KM, DecisionSpace AssetLink, DecisionSpace AssetPlanner, DecisionSpace AssetSolver, DecisionSpace Atomic Meshing, DecisionSpace Base Module, DecisionSpace Data Quality, DecisionSpace Desktop, DecisionSpace Dropsite, DecisionSpace Geoscience, DecisionSpace GIS Module, DecisionSpace GRC Module, DecisionSpace Nexus, DecisionSpace Reservoir, DecisionSuite, Deeper Knowledge, Broader Understanding., Depth Team, Depth Team Explorer, Depth Team Express, Depth Team Extreme, Depth Team Interpreter, DepthTeam, DepthTeam Explorer, DepthTeam Express, DepthTeam Extreme, DepthTeam Interpreter, Desktop Navigator, DESKTOP-PVT, DESKTOP-VIP, DEX, DIMS, Discovery, Discovery 3D, Discovery Asset, Discovery Framebuilder, Discovery PowerStation, Discovery Suite, DMS, Drillability Suite, Drilling Desktop, DrillModel, DrillNET, Drill-to-the-Earth-Model, Drillworks, Drillworks ConnectML, Drillworks Predict, DSS, Dynamis Frameworks to Fill, Dynamic Reservoir Management, Dynamic Surveillance System, EDM, EDM AutoSync, EDT, eLandmark, Engineer's Data Model, Engineer's Desktop, Engineer's Link, ENGINEERING NOTES, eNotes, ESP, Event Similarity Prediction, ezFault, ezModel, ezSurface, ezTracker, ezTracker2D, ezValidator, FastTrack, Field Scenario Planner, FieldPlan, For Production, FrameBuilder, Frameworks to Fill, FZAPI, GeoAtlas, GeoDataLoad, GeoGraphix, GeoGraphix Exploration System, Geologic Interpretation Component, Geometric Kernel, GeoProbe, GeoProbe GF DataServer, GeoSmith, GES, GES97, GesFull, GESXplorer, GMAplus, GMI Imager, Grid3D, GRIDGENR, H. Clean, Handheld Field Operator, HHFO, High Science Simplified, Horizon Generation, I² Enterprise, iDIMS, iEnergy, Infrastructure, iNotes, Iso Core, IsoMap, iWellFile, KnowledgeSource, Landmark (*as service*), Landmark (*as software*), Landmark Decision Center, LandNetX, Landscape, Large Model, Lattix, LeaseMap, Limits, LithoTect, LogEdit, LogM, LogPrep, MagicDesk, Make Great Decisions, MathPack, MDS Connect, MicroTopology, MIMIC, MIMIC+, Model Builder, NETool, Nexus (*as service*), Nexus (*as software*), Nexus View, Object MP, OneCall, OpenBooks, OpenJournal, OpenLink, OpenSGM, OpenVision, OpenWells, OpenWire, OpenWire Client, OpenWire Server, OpenWorks, OpenWorks Development Kit, OpenWorks Production, OpenWorks Well File, Operations Management Suite, PAL, Parallel-VIP, Parametric Modeling, Permedia, Petris WINDS Enterprise, PetrisWINDS, PetroBank, PetroBank Explorer, PetroBank Master Data Store, PetroWorks, PetroWorks Asset, PetroWorks Pro, PetroWorks ULTRA, PLOT EXPRESS, PlotView, Point Gridding Plus, Pointing Dispatcher, PostStack, PostStack ESP, PostStack Family, Power Interpretation, PowerCalculator, PowerExplorer, PowerExplorer Connect, PowerGrid, PowerHub, PowerModel, PowerView, PrecisionTarget, Presgraf, PressWorks, PRIZM, Production, Production Asset Manager, PROFILE, Project Administrator, ProMAGIC Connect, ProMAGIC Server, ProMAX, ProMAX 2D, ProMax 3D, ProMAX 3DPSDM, ProMAX 4D, ProMAX Family, ProMAX MVA, ProMAX VSP, pSTAx, Query Builder, Quick, Quick+, QUICKDIF, Quickwell, Quickwell+, Quiklog, QUIKRAY, QUIKSHOT, QUIKVSP, RAVE, RAYMAP, RAYMAP+, Real Freedom, Real Time Asset Management Center, Real Time Decision Center, Real Time Operations Center, Real Time Production Surveillance, Real Time Surveillance, Real-time View, Recall, Reference Data Manager, Reservoir, Reservoir Framework Builder, RESev, ResMap, Resolve, RTOC, SCAN, SeisCube, SeisMap, SeisMapView, Seismic Data Check, SeisModel, SeisSpace, SeisVision, SeisWell, SeisWorks, SeisWorks 2D, SeisWorks 3D, SeisWorks PowerCalculator, SeisWorks PowerJournal, SeisWorks PowerSection, SeisWorks PowerView, SeisXchange, Semblance Computation and Analysis, Sierra Family, SigmaView, SimConnect, SimConvert, SimDataStudio, SimResults, SimResults+, SimResults+3D, SIVA+, SLAM, Smart Change, Smart Deploy, Smart Flow, Smart Skills, Smart Start, Smart Sustain, Smart Transform, Smart Vision, SmartFlow, smartSECTION, smartSTRAT, Spatializer, SpecDecomp, StrataMap, StrataModel, StratAmp, StratSim, StratWorks, StratWorks 3D, StreamCalc, StressCheck, STRUCT, Structure Cube, Surf & Connect, SurfNet, SynTool, System Start for Servers, SystemStart, SystemStart for Clients, SystemStart for Servers, SystemStart for Storage, Tanks & Tubes, TDQ, Team Workspace, TERAS, T-Grid, The Engineer's DeskTop, Total Drilling Performance, TOW/cs, TOW/cs Revenue Interface, TracPlanner, TracPlanner Xpress, Trend Form Gridding, Trimmed Grid, Tubular Basic, Turbo Synthetics, Unconventional Essentials, VESPA, VESPA+, VIP, VIP-COMP, VIP-CORE, VIPDataStudio, VIP-DUAL, VIP-ENCORE, VIP-EXECUTIVE, VIP-Local Grid Refinement, VIP-THERM, vSpace, vSpace Blueprint, vSpace Onsite, WavX, Web Editor, Well H. 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Appendix A

Data Loading Flow Charts

This appendix contains generalized flow charts for loading the following data types:

- 3D Data Loading
- 2D Data Loading Workflow 1 - Navigation in ASCII Files
- 2D Data Loading Workflow 2 - No Navigation ASCII Files

Use these charts as a quick checklist of the steps that need to be taken while preparing and loading of each type of seismic data.

Generalized 3D Data Loading Flow

1. Gather background data and fill out Project Specification form.

Date: _____

Interpreter(s): _____

Project Name: _____

Area: _____

Blocks: _____

Cartographic
Reference System _____

Project
Measurement
System _____

Upper Left Line = _____

Upper Left Trace = _____

X: _____

Y: _____

Upper Right Line = _____

Upper Right Trace = _____

X: _____

Y: _____



Lower Left Line = _____

Lower Left Trace = _____

X: _____

Y: _____

Lower Right Line = _____

Lower Right Trace = _____

X: _____

Y: _____

Line increment: _____

Trace increment: _____

Line spacing: _____ feet/meters

Trace spacing: _____ feet/meters

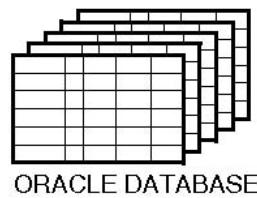
Zone of interest for timeslice generation: _____ ms to _____ ms (every _____ ms)

Zone of interest for scaling data: _____ ms to _____ ms

Geophysicist: _____

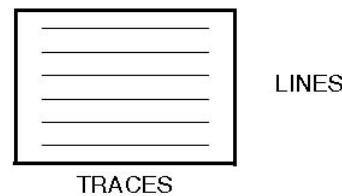
Date: _____

2. Select or create the OpenWorks project database.



OpenWorks Command Menu > Project > Project Admin > Project > Project Database > Create... (See Appendix D)

3. Create the 3D survey.



Data > Management > Seismic Data Manager

View > 3D

File > New > 3D Survey

This step defines the survey grid by line numbers, trace numbers, and survey orientation. This information controls how seismic data is loaded and how interpreted horizon data is stored.

You also define world coordinates in this step. Fault information is stored according to world coordinates.



If you have the x, y coordinates for at least three corner points of the grid, use the SeisWorks Grid Transform utility, or Seismic Data Manager in order to calculate the fourth corner.

OpenWorks Command Menu > Data > Management > Seismic Tools

Utilities > SeisWorks Grid Transform

or:

OpenWorks Command Menu > Data > Management > Seismic Data Manager

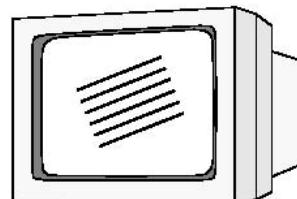
4. Create seismic file storage directories.

Data > Management > Seismic Data Manager

View > 3D

Tools > Seismic File Storage...

5. Check map.



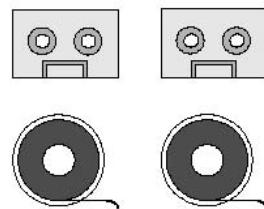
OpenWorks Command Menu > Applications > SeisWorks

Interpret > Map...

or,

OpenWorks Command Menu > Applications > DecisionSpace Geosciences > Map...

6. Analyze SEG-Y data.



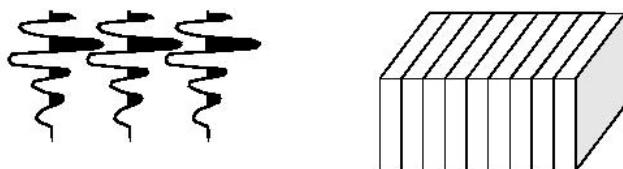
OpenWorks Command Menu > Data > Seismic Tools

Seismic > SEGY Analyzer

or:

**OpenWorks Command Menu > Data > Import > SEGY Import
> Format tab...**

7. Load the data.

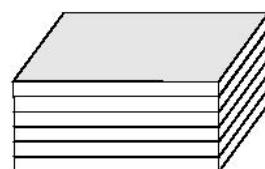


Seismic Tools > Seismic > PostStack Data Loader

or:

OpenWorks Command Menu > Data > Import > SEGY Import

8. Generate timeslices if necessary (when "classic" .3dv format is loaded). Skip this step when loading .cmp or .bri volumes.



Seismic Tools > Seismic > PostStack Data Loader (use .3dv input, not SEG-Y file)

or:

Seismic Tools > Seismic > Seismic Converter

9. Back up all project data (oracle project, OpenWorks external files, and seismic external files).

OpenWorks Command Menu > Project Administration > Project > Project Database > Backup...

Generalized 2D Data Loading Flow - Workflow 1

This workflow is useful for loading 2D data in which navigation information and shotpoint-to-trace data is available in a separate ASCII file.

1. Collect the following information:

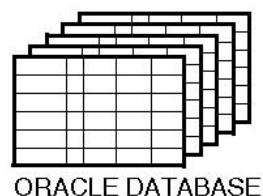
- Line header information - line name, minimum trace, and maximum trace.
- Shotpoint-to-trace information - line name, shotpoint, and trace number.

At least two shotpoint-to-trace point pairs must be available for each seismic line.

- Navigation information - line name, shotpoint, and x,y coordinate.

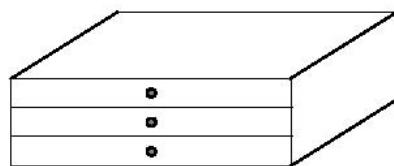
If paper sections and a copy of the basemap are available, have those handy. These pieces of information are readily available from the seismic contractor for data that has been recently acquired.

2. Create or select the OpenWorks project (See Appendix D).



OpenWorks Command Menu > Project > Project Administration > Project > Project Database > Create...

3. Create the 2D seismic survey.



**OpenWorks Command Menu > Data > Management >
Seismic Data Manager**

View > 2D

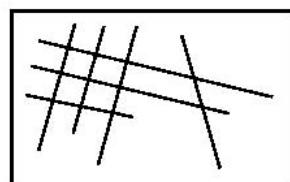
File > New > 2D Survey

4. Create seismic storage directories.

**OpenWorks Command Menu > Data > Management >
Seismic Data Manager**

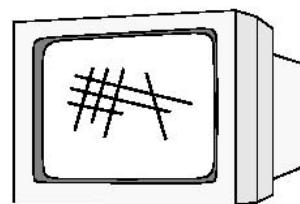
Tools > Seismic Files Storage...

5. Load navigation data into OpenWorks project.



OpenWorks Command Menu > Data > Import > Data Import

6. Quality check navigation data.



**OpenWorks Command Menu > Data > Management >
Seismic Data Manager**

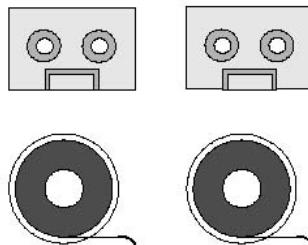
and

**OpenWorks Command Menu > Applications >
SeisWorks Interpret > Map...**

or:

**OpenWorks Command Menu > Applications > DecisionSpace
Geosciences > Map...**

7. Analyze seismic data.



Seismic Tools > Seismic > SEGY Analyzer

or:

***segchk* command line utility (See Appendix E)**

or:

**OpenWorks Command Menu > Data > SEGY Import > Format
> Analyzer**

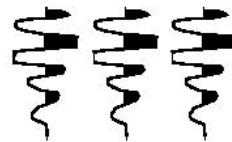
8. Load the data.



Trace balance if necessary.

Seismic Tools > Seismic > PostStack Data Loader

9. If desired, permanently scale the data.



Seismic Tools > Seismic > PostStack Data Loader

10. Check the scaled data.

OpenWorks Command Menu > Applications > SeisWorks

Interpret > Seismic

or:

OpenWorks Command Menu > Applications > DecisionSpace Geosciences > Section

11. Do final load, using the desired scaling factor.

Seismic Tools > Seismic > PostStack Data Loader

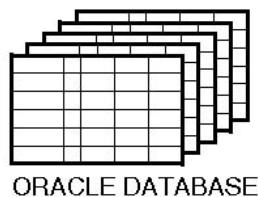
12. Back it all up.

OpenWorks Command Menu > Project > Project Administration > Project > Project Database > Backup...

Generalized 2D Data Loading Flow - Workflow 2

This workflow is used to load 2D data when line header, shotpoint-to-trace, and/or navigation information is not readily available. The line header information (line name, minimum trace number, and maximum trace number), shotpoint to trace data, and navigation data may be extracted from seismic trace headers and loaded into OpenWorks by PostStack Data Loader at the same time the seismic trace data is loaded into the Interpretation project.

1. Gather all available information, such as basemaps and paper sections from the survey area.
2. Create or select the OpenWorks project (See Appendix D).



OpenWorks Command Menu > Project > Project Administration > Project > Project Database > Create...

3. Create 2D survey.

OpenWorks Command Menu > Data > Management > Seismic Data Manager

View > 2D

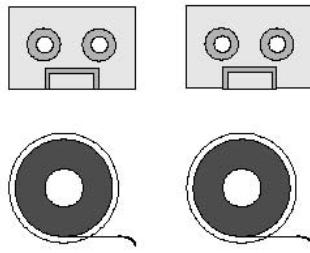
File > New > 2D Survey

4. Create seismic storage directories.

OpenWorks Command Menu > Data > Management > Seismic Data Manager

Tools > Seismic Files Storage...

5. Analyze seismic files.



Seismic Tools > Seismic > SEGY Analyzer

or:

***segychk* command line utility (See Appendix E)**

or:

OpenWorks Command Menu > Data > SEGY Import > Format > Analyzer

6. Load navigation data and do tests load of seismic trace data.

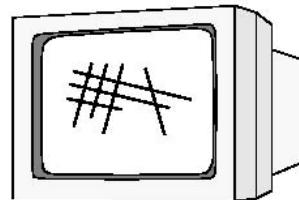


Seismic Tools > Seismic > PostStack Data Loader

or:

OpenWorks Command Menu > Data > Import > SEGY Import

7. Quality check navigation data.



**OpenWorks Command Menu > Data > Management >
Seismic Data Manager**

and

**OpenWorks Command Menu > Applications >
SeisWorks Interpret > Map...**

or

**OpenWorks Command Menu > Applications > DecisionSpace
Geosciences > Map...**

8. View data and check scaling.



**OpenWorks Command Menu > Applications > SeisWorks
Interpret > Seismic**

or:

**OpenWorks Command Menu > Applications > DecisionSpace
Geosciences > Section**

9. Do final load using the desired scaling factor (if permanent scaling is desired/necessary).

Seismic Tools > Seismic > PostStack Data Loader

or:

OpenWorks Command Menu > Data > Import > SEGY Import

10. Back it all up.

**OpenWorks Command Menu > Project > Project Admin >
Project > Project Database > Backup...**

Appendix B

Binary and Trace Header Records

The following pages contain tables that illustrate the SEG-Y tape format. These tables are from: Barry, Cavers, and Kneale (1975), Recommended standards for digital tape formats, Geophysics, v. 40: 344-352.

Overview

In each table, two asterisks next to the byte numbers indicates data you **must** have before you can load your seismic data: the sample interval (byte numbers 3217-3218), the number of samples per data trace (byte numbers 3221-3222), and the format of the data (byte numbers 3225-3226).

The single asterisk indicates data you should record, if possible. Note that in the table below, the byte numbers start at 3201. This assumes that the 3200-byte EBCDIC header appears before the Binary header on the tape.

The seismic data are stored in SEG-Y, integer, Motorola format. The SEG-Y files on this CD-ROM conform to the SEG-Y standard format (Barry and others, 1975) with the exception of the 3600-byte reel identification header which is provided in ASCII format. Standard SEG-Y uses a EBCDIC 3600-byte reel identification header. The Delph Seismic version of SEG-Y consists of the following:

- A 3600-byte reel identification header with the first 3200 bytes consisting of an ASCII header block and a 400-byte binary header block. Both headers include information specific to the line and reel number.
- The trace data block follows the reel identification header. The first 240 bytes of each trace block is the binary trace identification header. The seismic data samples follow the trace identification header.

400-Byte Binary Reel Identification Header
 (Record 2, the Binary-Coded Block) Binary Code: Right Justified

| Byte Numbers | Should Record | Description |
|--|----------------------|---|
| 3201 - 3204 | | Job identification number |
| 3205 - 3208 | * | Line number (only one line per reel) |
| 3209 - 3212 | * | Reel number |
| 3213 - 3214 | * | Number of data traces per record (includes dummy and zero traces inserted to fill out the record or common depth point) |
| 3215 - 3216 | * | Number of auxiliary traces per record (includes sweep, timing, gain, sync, and all other non-data traces) |
| 3217 - 3218 | ** | Sample interval in microseconds (for this reel of data) |
| 3219 -3220 | | Sample interval in microseconds for original field recording |
| (Intervals are designated in microseconds to accommodate intervals less than one millisecond.) | | |
| 3221 - 3222 | ** | Number of samples per data trace (for this reel of data) |
| 3223 - 3224 | | Number of samples per data trace (for original field recording) |
| 3225 - 3226 | ** | Data sample format code: 1 = floating point (4 bytes) 2 = fixed point (4 bytes) 3 = fixed point (2 bytes) 4 = fixed point with gain code (4 bytes) Auxiliary traces use the same number of bytes per sample. |
| 3227 | - 3228 * | CDP fold (expected number of data traces per CDP ensemble) |
| 3229 - 3230 | * | Trace sorting code: 1 = as recorded (no sorting) 2 = CDP ensemble 3 = single fold continuous profile 4 = horizontally stacked |

| | | |
|-------------|--|---|
| 3231 - 3232 | | Vertical sum code: 1 = no sum 2 = two sum, ... N = N sum (N = 32,767) |
| 3233 - 3234 | | Sweep frequency at start |
| 3235 - 3236 | | Sweep frequency at end |
| 3237 - 3238 | | Sweep length (milliseconds) |
| 3239 - 3240 | | Sweep type code: 1 = linear 2 = parabolic 3 = exponential 4 = other |
| 3241 - 3242 | | Trace number of sweep channel |
| 3243 - 3244 | | Sweep trace taper length in milliseconds at start if tapered (the tape starts at zero time and is effective for this length) |
| 3245 - 3246 | | Sweep trace taper length in milliseconds at end (the ending taper starts at sweep length minus the taper length at end) |
| 3247 - 3248 | | Taper type: 1 = linear 2 = cos 3 = other |
| 3249 - 3250 | | Correlated data traces: 1 = no 2 = yes |
| 3251 - 3252 | | Binary gain recovered 1 = yes 2 = no |
| 3253 - 3254 | | Amplitude recovery method: 1 = none 2 = spherical divergence 3 = AGC 4 = other |

| | | |
|-------------|---|---|
| 3255 - 3256 | * | Measurement system 1 = meters 2 = feet |
| 3257 - 3258 | | Impulse signal 1 = Increase in pressure or upward geophone case movement gives negative number on tape Polarity 2 = Increase in pressure or upward geophone movement gives positive number on tape |
| 3259 - 3260 | * | Vibratory polarity code; seismic signal lags pilot signal by: 1 = 337.5 to 22.5 degrees 2 = 22.5 to 67.5 degrees 3 = 67.5 to 112.5 degrees 4 = 112.5 to 157.5 degrees 5 = 157.5 to 202.5 degrees 6 = 202.5 to 247.5 degrees 7 = 247.5 to 292.5 degrees 8 = 292.5 to 337.5 degrees |
| 3261 - 3600 | | Unassigned; for optional information |

Table 2: Trace Identification Header

| Byte Numbers | Should Record | Description |
|--------------|---------------|---|
| 1 - 4 | * | Trace sequence number within line; numbers continue to increase if additional reels are required on same line |
| 5 - 8 | | Trace sequence number within reel; each reel starts with trace number one |
| 9 - 12 | * | Original field record number |
| 13 - 16 | * | Trace number within the original field record |
| 17 - 20 | | Energy source point number; used when more than one record occurs at the same effective surface location |
| 21 - 24 | | CDP ensemble number |

| | | |
|---------|---|---|
| 25 - 28 | | Trace number |
| 29 - 30 | * | Trace identification code: 1 = seismic data 2 = dead 3 = dummy 4 = time break 5 = uphole 6 = sweep 7 = timing 8 = water break 9 - N = optional use (N<32767) |
| 31 - 32 | | Number of vertically summed traces yielding this trace (1 is one trace, 2 is two summed traces, etc.) |
| 33 - 34 | | Number of horizontally stacked traces yielding this trace (1 is one trace, 2 is two stacked traces, etc.) |
| 35 - 36 | | Data use: 1 = production 2 = test |
| 37 - 40 | | Distance from source point to receiver group (negative if opposite to direction in which line is shot) |
| 41 - 44 | | Receiver group elevation; all elevations above sea level are positive and below sea level are negative |
| 45 - 48 | | Surface elevation at source |
| 49 - 52 | | Source depth below surface (a positive number) |
| 53 - 56 | | Datum elevation at receiver group |
| 57 - 60 | | Datum elevation at source |
| 61 - 64 | | Water depth at source |

Table 2: Trace Identification Header

| Byte Numbers | Should Record | Description |
|--------------|---------------|----------------------|
| 65 - 68 | | Water depth at group |

| | | |
|--|--|--|
| 69 - 70 | | Scalar to be applied to all elevations and depths specified in bytes 41-68 to give the real value Scalar = 1, +10, +100, +1000, or +10,000 If positive, scalar is used as a multiplier; if negative, scalar is used as a divisor. |
| 71 - 72 | | Scalar to be applied to all coordinates specified in bytes 73-88 to give the real value Scalar = 1, +10, +100, +1000, or +10000 If positive, scalar is used as a multiplier; if negative, scalar is used as divisor. |
| 73 - 76 | | Source coordinate x; see Note below. |
| 77 - 80 | | Source coordinate y; see Note below. |
| 81 - 84 | | Group coordinate x; see Note below. |
| 85 - 88 | | Group coordinate y; see Note below. |
| Note: If the coordinate units are in seconds of arc, the x values represent longitude and the y values latitude. A positive value designates the number of seconds east of Greenwich Meridian or north of the equator and a negative value designates the number of seconds west or south. | | |
| 89 - 90 | | Coordinate units: 1 = length (meters or feet) 2 = seconds of arc |
| 91 - 92 | | Weathering velocity |
| 93 - 94 | | Sub weathering velocity |
| 95 - 96 | | Uphole time at source |
| 97 - 98 | | Uphole time at group |
| 99 - 100 | | Source static correction |
| 101 - 102 | | Group static correction |
| 103 - 104 | | Total static applied (zero if no static has been applied) |
| 105 - 106 | | Lag time A. Time in ms between end of 240-byte trace identification header and time break. Positive if time break occurs after end of header, negative if time break occurs before end of header. Time break is defined as the initiation pulse which may be recorded on an auxiliary trace or as otherwise specified by the recording system. |

| | | |
|-----------|--|--|
| 107 - 108 | | Lag time B. Time in ms between time break and the initiation time of the energy source. May be positive or negative. |
|-----------|--|--|

Table 2: Trace Identification Header

| Byte Numbers | Should Record | Description |
|--------------|---------------|---|
| 109 - 110 | | Delay recording time. Time in ms between initiation time of energy source and time when recording of data samples begins (for deep water work if data recording does not start at zero time). |
| 111 - 112 | | Mute time: start |
| 113 - 114 | | Mute time: end |
| 115 - 116 | * | Number of samples in this trace |
| 117 - 118 | * | Sample interval in ms for this trace |
| 119 - 120 | | Gain type of field instruments: 1 = fixed 2 = binary 3 = floating point 4 - N = optional use |
| 121 - 122 | | Instrument gain |
| 123 - 124 | | Instrument gain constant |
| 123 - 124 | | Instrument early or initial gain (db) |
| 125 - 126 | | Correlated: 1 = no 2 = yes |
| 127 - 128 | | Sweep frequency at start |
| 129 - 130 | | Sweep frequency at end |
| 131 - 132 | | Sweep length in ms |

| | | |
|-----------|--|--|
| 133 - 134 | | Sweep type: 1 = linear 2 = parabolic 3 = exponential 4 = other |
| 135 - 136 | | Sweep trace taper length at start in ms |
| 137 - 138 | | Sweep trace taper length at end in ms |
| 139 - 140 | | Taper type: 1 = linear 2 = cos2 3 = other |
| 141 - 142 | | Alias filter frequency, if used |
| 143 - 144 | | Alias filter slope |
| 145 - 146 | | Notch filter frequency |
| 145 - 146 | | Notch filter slope |

Table 2: Trace Identification Header

| Byte Numbers | Should Record | Description |
|---------------------|----------------------|---|
| 149 - 150 | | Low cut frequency, if used |
| 151 - 152 | | High cut frequency, if used |
| 153 - 154 | | Low cut slope |
| 155 - 156 | | High cut slope |
| 157-158 | | Year data recorded (four digit integer) |
| 159 - 160 | | Day of year |
| 159 - 160 | | Day of year |
| 161 - 162 | | Hour of day (24-hour clock) |

| | | |
|-----------|--|---|
| 163 - 164 | | Minute of hour |
| 165 - 166 | | Second of minute |
| 167 - 168 | | Time basis code: 1 = local 2 = GMT 3 = other |
| 169 - 170 | | Trace weighting factor; defines as 2-N volts for the least significant bit (N = 0, 1, ... 32, 767) |
| 171 - 172 | | Geophone group number of roll switch position one |
| 173 - 174 | | Geophone group number of trace number one within original field record |
| 175 - 176 | | Geophone group number of last trace within original field record |
| 177 - 178 | | Gap size (total number of groups dropped) |
| 179 - 180 | | Over travel associated with taper at beginning or end of line: 1 = down (or behind) 2 = up (or ahead) |
| 181 - 240 | | Unassigned; for optional information |

Appendix C

Prebuilt Sessions in PostStack Data Loader

| Flow # | Process | Parameters/Options |
|----------------------------------|------------------------|---|
| ps1: PS Amplitude Scaling | | |
| Flow 1 | Automatic Gain Control | Mean Value Normalization Scaling Window Length: 500 ms |
| Flow 2 | Trace Equalization | Mean Value Equalization Start Time: 700 ms; Interval: 1300 ms |
| Flow 3 | Time-Variant Scaling | 3 Gates with time and gain as follows: 1) Time = 0-500 Gain = 1.5 2) Time = 700-1800 Gain = 3.7 3) Time = 2500-4000 Gain = 6.5 |
| Flow 4 | Envelope Scaling | Amplitude Envelope Response: Slow (3-6) |
| ps2: PS Basic Filtering | | |
| Flow 1 | Bandpass (Ormsby) | 8-12-40-50 filter |
| Flow 2 | Bandpass (Butterworth) | 18 dB/octave-8 -40-72 dB/octave filter |
| Flow 3 | Phase Rotation | 0° rotation |
| Flow 4 | Polarity Reversal | |
| Flow 5 | Resample Filter | Output sample rate: 4 Anti-Alias Filter applied |
| Flow 6 | Autocorrelation | Window: 700-1300 |

| Flow # | Process | Parameters/Options |
|------------------------------------|---------------------|--|
| ps3: PS Basic Deconvolution | | |
| Flow 1 | Deconvolution | Minimum Phase Spiking Operator Length: 80 ms White Noise: 0.1% Time Gate Number: 1 Start Time: 700 ms; Interval: 1800 ms |
| Flow 2 | Deconvolution | Minimum Phase Predictive Operator Length: 120 ms Prediction Distance: 36 ms White Noise: 0.1% Time Gate Number: 1 Start Time: 700 ms; Interval: 1800 ms |
| Flow 3 | Spectral Balance | Scaling Time Window: 250 ms Number of Frequency Panels: 5 5-10-60-70 filter |
| Flow 4 | Wavelet Convolution | Operation: Deconvolve Wavelet Source: OpenWorks Filter Option: Inverse Phase (Dephaser) Operator Percent Noise in Time Domain: .1 |
| ps4: PS Data Enhancement | | |
| Flow 1 | Trace Mix | Weighting: Triangular # Traces to Mix: 3 |
| Flow 2 | FX Deconvolution | Horizontal Window Length: 10 traces # Filter Samples: 5 traces Time Window Length: 1000 ms Time Window Overlap: 100 ms |
| Flow 3 | Coherency Filter | Horizontal Window Length: 20 traces Time Window Length: 1000 ms Time Window Overlap: 100 ms |
| Flow 4 | Dip-Scan Stack | Horizontal Window Length: 7 traces Minimum Dip: -6 ms/trace Maximum Dip: +6 ms/trace |
| Flow 5 | FK Weighting | FK Power Exponent: 1.2 |
| Flow 6 | FK Fan Filter | Filter Application Mode: Accept Minimum Dip: -6 ms/trace Maximum Dip: +6 ms/trace |
| ps5: PS shifting/stretching | | |

| Flow 1 | Flatten to Horizon | Flatten: activated Horizon Name: must be set by user Flattening Time: 1000 ms |
|---|--|--|
| Flow 2 | Bulk time shift with increase in trace length | Trace Length: 7000 ms Bulk Time Shift: 1000 ms |
| Flow 3 | Time to depth conversion | Output sample rate: 10 |
| Flow # | Process | Parameters/Options |
| ps6: PS Data Attributes | | |
| Flow 1 | Reflection Strength | |
| Flow 2 | Instantaneous Phase | |
| Flow 3 | Instantaneous Frequency | |
| Flow 4 | Quadrature Trace | |
| Flow 5 | Apparent Polarity | |
| Flow 6 | Response Phase | |
| Flow 7 | Response Frequency | |
| Flow 8 | Perigram | |
| Flow 9 | Cosine of Phase | |
| Flow 10 | Perigram * Cosine of Phase | |
| timeDepth: PS simple time to depth conversion using a TDQ velocity model | | |
| Flow 1 | Time to Depth conversion | Bandpass (Butterworth): Low Pass 8, High Pass 40, Low Slope 18, High Slope 72 Trace Equalization: 1 gate 700-4500 ms Time to Depth Conversion: Output Sample Rate 10, Maximum frequency of interest 80 |
| Flow 2 | Depth to time conversion | Bandpass (Butterworth): Low Pass 8, High Pass 40, Low Slope 18, High Slope 72 Trace Equalization: 1 gate 700-4500 ms Time to Depth Conversion: Output Sample Rate 4, Maximum frequency of interest 80 |
| usernet: PAL/PS Flows from August 1985 UserNet article | | |
| Flow 1 | Attribute Extraction (Maps): Spectral Statistics | Analysis Window: 950-1050 ms Dominant Frequency Series Output Horizon Prefix: Usernet No scaling |
| Flow 2 | Perigram * Cosine of Phase | |

| Flow 3 | Trace Mix Bandpass (Ormsby) Trace Equalization | Weighting : Triangular # Trace to Mix: 3 Gate Number: Single Gate 8-12-50-60 filter Mean Value Equalization Start Time: 700 ms; interval: 1300 ms |
|---|---|--|
| Flow 4 | Spectral Balance | Scaling Time Window: 250 ms Number of Panels: 5 5-10-60-70 filter |
| Flow 5 | Attribute Extraction Amplitude Statistics Complex Trace Statistics Spectral Statistics | Analysis Window: 950-1050 ms All six amplitude statistics Average Instantaneous Frequency Peak Spectral Frequency Slope from Peak to max Frequency Max Frequency Estimates: 100 # Traces for Spectral Averaging: 1 Output Horizon Prefix: Usernet No Scaling |
| wavelet: PS use a syntool wavelet to zero-phase your data | | |
| Flow 1 | Convolute with a SynTool dephase operator and bandpass, scale your data | Wavelet Convolution: Operation Convolve, Wavelet Source OpenWorks® software Bandpass (Butterworth): Low Pass 8, High Pass 90, Low Slope 18, High Slope 72 AGC: Scaling Window Length 1500 ms, Mean Value Normalization |
| If you have a license for PostStack ESP™ processing, you can run five additional sessions. Several of these flows bracket the PostStack ESP™ processes with specific start and end times in the input menu. | | |
| ESP1: Test ESP Parameters using ESP 3D Along Horizon: <ul style="list-style-type: none"> • If you read I/O on input, data will be limited from 900-1100 ms • Make sure all output data options are toggled off | | |
| Flow # | Process | Parameters/Options |

| | | |
|---|--|--|
| Flow 1 | ESP 3D Along Horizon: Submit first, make sure other two processes are toggled off | Default parameters except: Analysis Window: Constant Time Window Reference Time (ms): 1000 Centered Time Window (ms): 40 Output ESO Horizon: fscantest1_40_12_EL_MIN |
| | ESP 3D Along Horizon: submit after the above, make sure other two are toggled off | Default parameters except: Analysis Window: Constant Time Window Reference Time (ms): 1000 Centered Time Window (ms): 80 Output ESP Horizon: fscantest2_80_12_EL_MIN |
| | ESP 3D Along Horizon: submit last, make sure other two are toggled off | Default parameters except: Analysis Window: Constant Time Window Reference Time (ms): 1000 Centered Time Window (ms): 20 Output ESP Horizon: fscantest3_20_12_EL_MIN |
| Flow 2 Scan Pattern Test: You must change the window length to the value determined from viewing the output horizons in Flow 1. | | |
| Flow 2 | ESP 3D Along Horizon (from Flow 1) | Default parameters except: Analysis Window: Constant Time Window Reference Time (ms): 1000 Centered Time Window (ms): determined from Flow 1 Scan Pattern: One Trace Output ESP Horizon: fscantest4_??_12_OT_MIN |
| | ESP 3D Along Horizon (from Flow 1) | Default parameters except: Analysis Window: Constant Time Window Reference Time (ms): 1000 Centered Time Window (ms): determined from Flow 1 Scan Pattern: Cross Output ESP Horizon: fscantest5_??_12_CR_MIN |
| | ESP 3D Along Horizon (from Flow 1) | Default parameters except: Analysis Window: Constant Time Window Reference Time (ms): 1000 Centered Time Window (ms): determined from Flow 1 Scan Pattern: Star Output ESP Horizon: fscantest6_??_12_ST_MIN |

| | | |
|---|----------------------|---|
| Flow 3 Maximum Statistics Test: You should have selected all the main parameters from Flow 1 and Flow 2. | | |
| Flow 3 | ESP 3D Along Horizon | Default parameters except: Analysis Window: Constant Time Window Reference Time (ms): 1000 Centered Time Window (ms): determined from Flow 1 Scan Pattern: determined from Flow 2 Evaluation Statistic: Maximum Output ESP Horizon: <code>fscantest7_??_12_??_MAX</code> |
| ESP2: ESP 3D and ESP 2D Vertical File Generation for 3D data. If you read I/O on input, data will be limited to 0-3000ms. | | |
| | | |
| Flow 1 | ESP 3D | Dip Options: Unconstrained Scan Pattern: Ell - 2 Traces Window Length (ms): 40 Maximum Dip Search (ms/tr): 12 Evaluation Statistic: Minimum Remove DC Bias: On |
| Flow 2 | ESP 2D | Window Length (ms): 40 Maximum Dip Search (ms/tr): 12 Remove Bias: On |
| ESP3: ESP 3D and ESP 2D timeslice Generation for 3D data. If you read I/O on input, data will be limited from 1000 - 1500 ms. | | |
| | | |
| Flow 1 | ESP 3D | Dip Options: Unconstrained Scan Pattern: Ell - 2 Traces Window Length (ms): 40 Maximum Dip Search (ms/tr): 12 Evaluation Statistic: Minimum Remove DC Bias: On |
| Flow 2 | ESP 2D | Window Length (ms): 40 Maximum Dip Search (ms/tr): 12 Remove Bias: On |
| dip: Dip calculation using resample for a more accurate representation of the dip volumes. If you read I/O on input, data will be limited from 800 – 2000 ms. | | |
| | | |
| Flow 1 | Resample | Output Sample Rate 1.0 ms. Apply Anti-Alias Filter |
| | Dip and Azimuth | Window Length (ms): 40 Maximum Dip Search (ms/tr): 12 Output Statistic Dip |
| | Resample | Output Sample Rate 4.0 ms Apply Anti-Alias Filter |
| dipazim: Dip and Azimuth combined calculation that uses Resample to accurately represent the combined volume. This is followed by two scalars to map to the existing dipazim colorbar. | | |

| Flow 1 | Resample Dip and Azimuth Constant Scalar Constant Scalar | Output Sample Rate 1.0 ms. Apply Anti-Alias Filter Window Length (ms): 40 Maximum Dip Search (ms/tr): 8 Output Statistic Combined Dip and Azimuth -1 times Data value 32 plus Data value | | |
|---|---|--|-----------------|---------|
| If you have a combined PostStack/PAL™ license, you will also receive two PAL™ sessions. | | | | |
| Flow # | Data Attribute | Attribute Extraction | Analysis Window | Scaling |
| pal1: PAL™ Basic Attribute Extraction | | | | |
| Flow 1 | | Amplitude Statistics | 950-1050 ms | None |
| Flow 2 | | Complex Trace Statistics | 950-1050 ms | None |
| Flow 3 | | Spectral Statistics | 950-1050 ms | None |
| Flow 4 | | Sequence Statistics | 950-1050 ms | None |
| Flow 5 | | Correlation Statistics | 950-1050 ms | None |
| pal2: PAL™ Extended Attribute Extraction | | | | |
| Flow 1 | Reflection Strength | Amplitude Statistics | 950-1050 ms | None |
| Flow 2 | Instantaneous Phase | Amplitude Statistics | 950-1050 ms | None |
| Flow 3 | Instantaneous Frequency | Amplitude Statistics | 950-1050 ms | None |
| Flow 4 | Perigram * Cosine of Phase | Amplitude Statistics | 950-1050 ms | None |

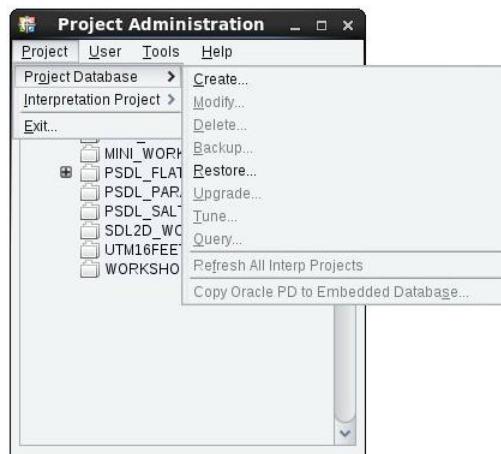
Appendix D

Creating an OpenWorks Project Database

All OpenWorks software applications require access to a project. Use the Project Administration utility to create a new project. When creating a project, specify:

- A project name and description
- A district name
- The cartographic reference system to use for storing map data in the database
- The default units of measure
- The geographic boundaries of the project area
- The size of the project
- Replacement velocity and datum elevation for seismic data

These are the standard settings that OpenWorks software projects use to store data. You can improve the accuracy and performance of your system by selecting defaults that match your project parameters. To create a project, launch **Project Administration** from the OpenWorks software command menu. Select **Project > Project Database > Create** to display the Create Project Database Tool.



General

Step 1 of 3: Define general information about the new project database.

The screenshot shows the 'Create Project Database' dialog box. The title bar says 'Create Project Database' and 'Step 1 of 3'. On the left, there's a vertical navigation bar with tabs: '1 - General' (highlighted in red), '2 - Project', and '3 - Area of Interest' (which is expanded). The main area is titled 'Describe the New Project Database'. It contains several input fields with placeholder text: 'Project database name: OWTRAIN', 'OpenWorks SID: OWTRAIN', 'District: OWTRAIN', 'Cartographic reference system', 'Measurement system', 'Description', 'Replacement velocity (unit n/a)', and 'Datum elevation (unit n/a)'. At the bottom, there are buttons for '< Back', 'Next >', 'Finish', 'Cancel', and 'Help...'. There are also three small '...' buttons next to the 'District', 'Cartographic reference system', and 'Measurement system' fields.

Project Database Name

The project database name:

- Must start with an alphabetical character
- Can contain a combination of letters, digits, or underscores
- Can be a maximum of 30 characters
- Cannot include any spaces or special characters other than underscores

OpenWorks SID

OpenWorks SID displays the database name where the project will be created.

District

Districts allow data managers to subset data into manageable components and prevent you from being overwhelmed with data outside your area of interest. When you start an OpenWorks software session, you first select a district. Click the browse (...) button to change the district from the District Selection dialog box.

Changing the OpenWorks software SID

If the new district belongs to another OpenWorks SID, the value of OpenWorks SID also changes.

Cartographic Reference System

The cartographic reference system (CRS) provides a geographic frame of reference for your data. When you create an OpenWorks software project, you specify a *project CRS* to store and calculate project data. The project CRS should be the same projection system that was used to locate the original project data. There are two basic types of CRS that you can choose from or create:

- Those based on projection coordinate systems using x's and y's
- Those based on geographic coordinate systems using latitudes and longitudes

Measurement System

Measurement system sets the default units for storing data in the project database. All data is stored in project-specific units and converted at load time from incoming units to project units. Although Landmark applications allow you to display data in any units, you should select the measurement system with units that are used most often. This ensures that OpenWorks software's performance is not slowed down by frequent unit conversions.

Description

Description is an optional field. You may enter a maximum of 80 characters of descriptive text about the project database.

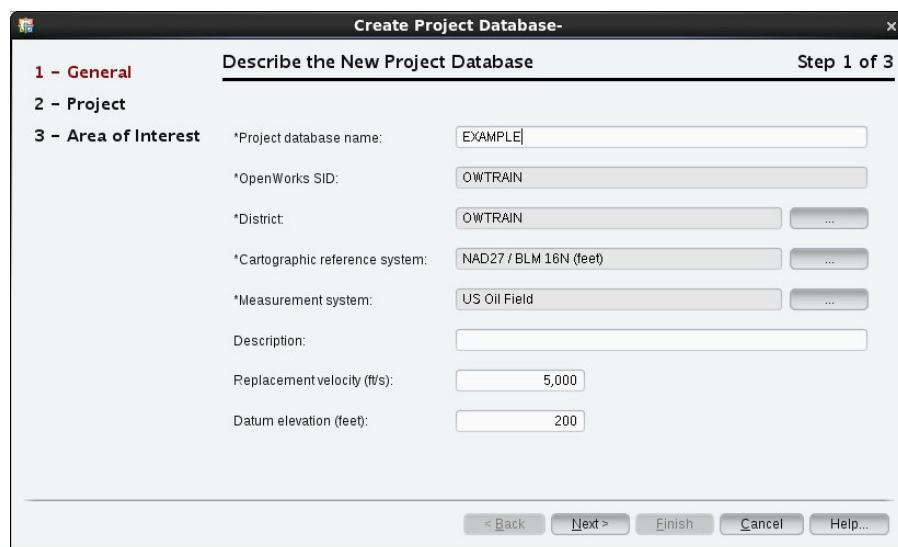
Replacement Velocity

Replacement velocity computes a time shift based on the difference in elevation between the storage datum of the data and the datum of the project. If the time-structure relationship in the data is to be preserved, specify a value for replacement velocity. The units depend on the measurement system configured in the project database. The value is applied to project data.

Datum Elevation

Datum elevation is the working datum for time data within the project, also defined as the **project datum**. All z-coordinates refer to this value. If your project involves multiple surfaces above sea level, select a datum at least equal to the shallowest Kelly bushing (KB). When connected to the project, time data will be datum shifted from the storage datum to the specified datum. The replacement velocity defined above will be used to compute a time shift based on the difference in elevation between the datum of the data and datum of the project.

For example:



If you created a project with the following parameters:

- The Project or *Working Datum* = 200 ft
- Replacement velocity = 5000 ft/sec

If the project data had the following fault segment values:

- Fault segment datum or *Storage Datum* = 100
- Fault segment *z* values = 200 ms, 400 ms

To adjust the ft/sec with ms units, use a factor of 1000, and multiply by two to double the value of

$$\text{datum shift: datum correction: } 40 = (((200-100) / (5000/1000)) * 2)$$

After correction to the project datum, the fault segment values are displayed in the project with the 40 ms datum shift correction.

- Fault Segment *z* values = 240 ms, 440 ms

Datum types in OpenWorks software R5000.10

- **Project datum** is the datum elevation associated with a project database (supplied in the project creation process described in this appendix. A replacement velocity is also stored with the project database.

Two other datum types are stored for some data types:

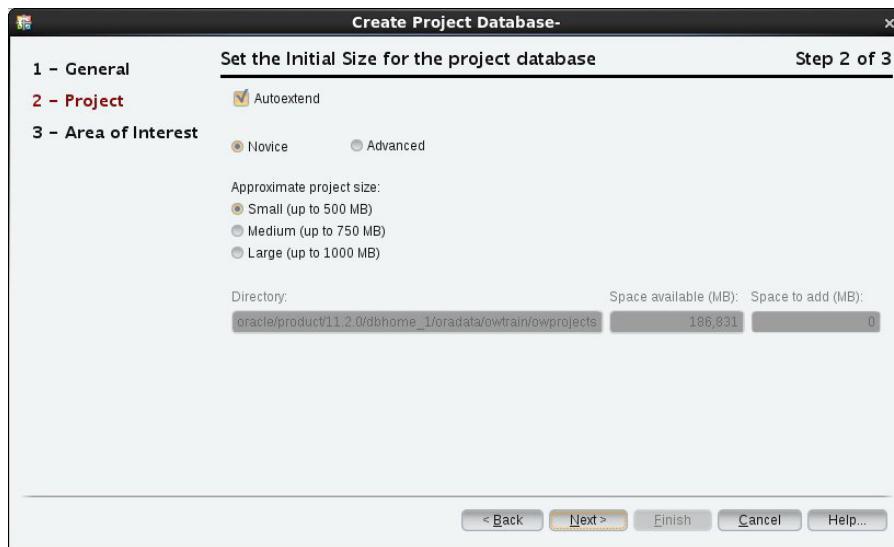
- **Storage datum** is saved to a database and represents the datum under which the data values were created.
- **Working datum** is the datum used when viewing the data in a project manager or other application. This datum is set for the individual data type outside of the project creation described in this appendix.

If the working datum is not set, the project datum will be used as the working datum.

For more information on how the working datum is used, see **OpenWorks command menu > Help > Online Manual > OpenWorks Online Help**.

Project Size

Step 2 of 3: Specify the project size of the new project database.



Autoextend

The size of an Oracle tablespace is determined by the values you specify when the Oracle database is installed. If you select the Autoextend feature, the file sizes increase in specified increments up to a specified maximum. Setting your data files to extend automatically provides the following benefits:

- Reduces the need for immediate intervention when a table runs out of space
- Ensures applications will not halt because of failures to allocate sufficient space

To increase the physical space manually, you can uncheck this box; however, this is not recommended. The recommended process is to keep Autoextend on and extend space automatically.

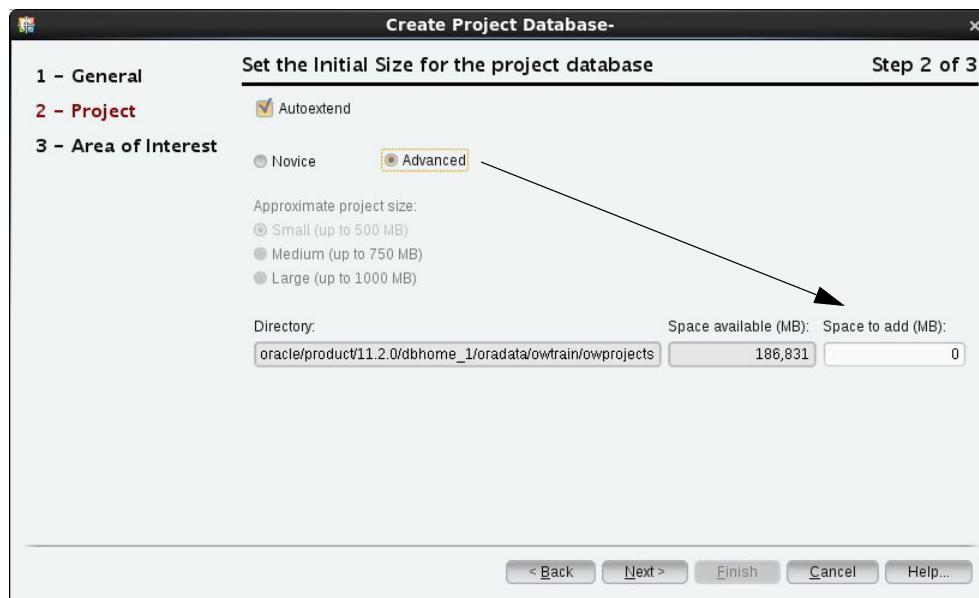
Monitor disk space usage frequently with Autoextend

If Autoextend is set, you are advised to monitor disk space usage regularly. If a data file attempts to grow beyond the available remaining size of a file system, a fatal error occurs.

Defining Project Size

The project size panel of the Create Project Database wizard provides two modes for allocating tablespace for your projects. You toggle between these modes using the Novice and Advanced buttons.

- **Novice** - Most users use this option to specify the general size of the project they want to create. Small is 500 megabytes (MB), medium is 750 MB, and large is 1000 MB or larger.
- **Advanced** - Some users may want to view available tablespace locations and specify the actual amount of space to reserve for their projects at each location. In this mode, you see the name and size of all available tablespace locations. A text box is enabled for you to enter the amount of space you want to use for your project at each of these locations.



Estimating Project Tablespace

If you ever fill up the tablespace inadvertently, your database may fail to access your project. Therefore, it is important to allocate enough tablespace for a project to accommodate all the data you expect to load (or generate). The Autoextend feature, if selected, prevents you from filling up the tablespace.

Minimum project size

The minimum project size is 500 MB.

There are several general guidelines you can follow to determine how much tablespace your project requires.

- **Raw data greater than 100 MB**

If the current set of curve data and the expected amount 2D horizon data is greater than 20 MB, use the following formula to estimate the OpenWorks software project tablespace size:

$$150 \text{ MB} + (2 \times \text{size of 2D horizon data}) + (1.5 \times \text{size of other raw data})$$

- **Raw data less than 100 MB**

Set the project tablespace size to Small.

- **Overestimate, then backup and restore**

Create your project by allocating more tablespace than you will require.

Load your data, and then from Project Admin menu, use **Project > Project Database > Modify** to determine how much tablespace you actually need.

If you need to reduce the size you gave initially to the project, use **Project > Project Database > Backup** to back up your project and **Project > Project Database > Restore** to restore it, specifying the correct amount of tablespace.

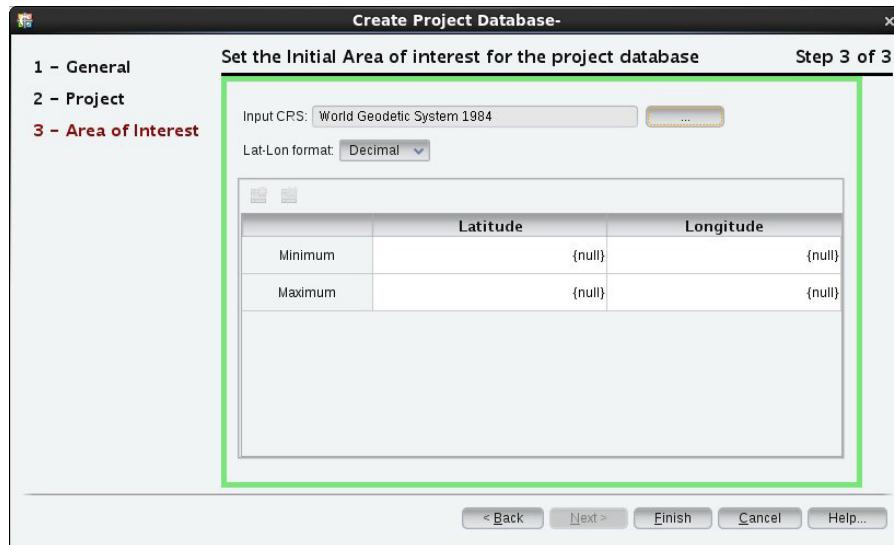
Although this workflow is a time-consuming process, it has the added benefit of not only giving you a chance to adjust the space, but it compresses extents in the Oracle tablespace which improves performance.

- **Add table space later**

Modifying the project later will allow users to add a specified amount of tablespace if the project requires it.

Area of Interest

Step 3 of 3: Specify the coordinates of the geographical area of the new project database.



Input CRS

You may choose to define the coordinates of your area of interest in a different CRS than the CRS your project data is stored in.

Areal Extents

The area of interest defines the minimum and maximum coordinates of the area covered by your project. The coordinates can be specified in the following formats:

- Geographical (lat/lon)
- Projected (x,y)

Note

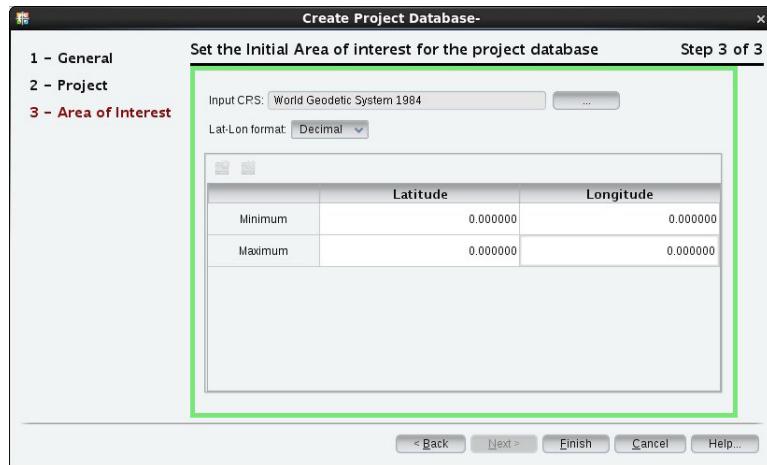
SeisWorks and some other Landmark applications require a projected coordinate system.

If the coordinate system is a geographic coordinate system, select Decimal or D-M-S (degrees-minutes-seconds) in the Lat-Lon format drop-down menu.

Decimal

Enter the **Minimum** and **Maximum** number of degrees in each of the Latitude and Longitude text boxes.

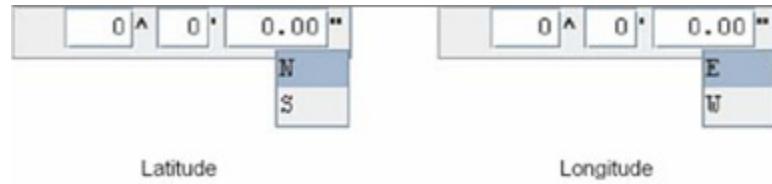
Use the value to the left of the decimal point as degrees and the value to the right of the decimal point as fractions of a degree. Valid latitudes range from -90 degrees to 90 degrees, and valid longitudes range from -180 degrees to 180 degrees. For example, enter 30 degrees south as -30 in the latitude boxes, or enter 20 degrees, 30 minutes north as 20.5.



D-M-S

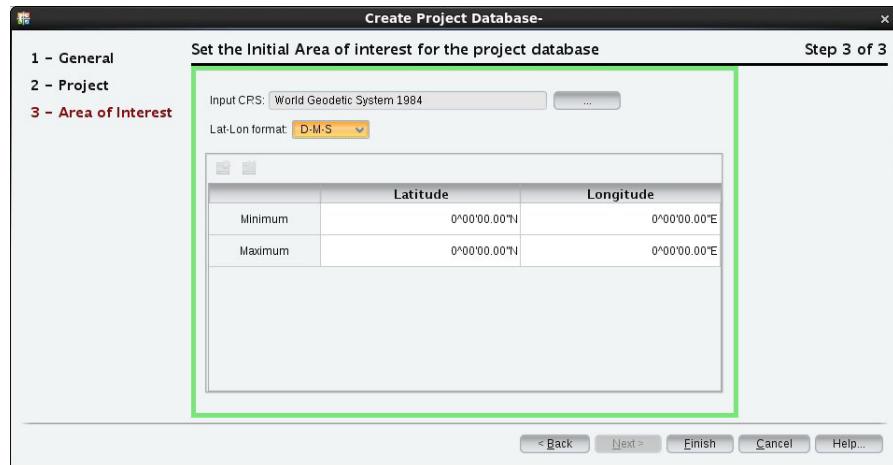
Enter **Minimum** and **Maximum** values in each of the Latitude and Longitude text boxes.

When the insertion cursor is in one of the text boxes, three sub-boxes and a drop-down menu appear in the text box, as shown below.



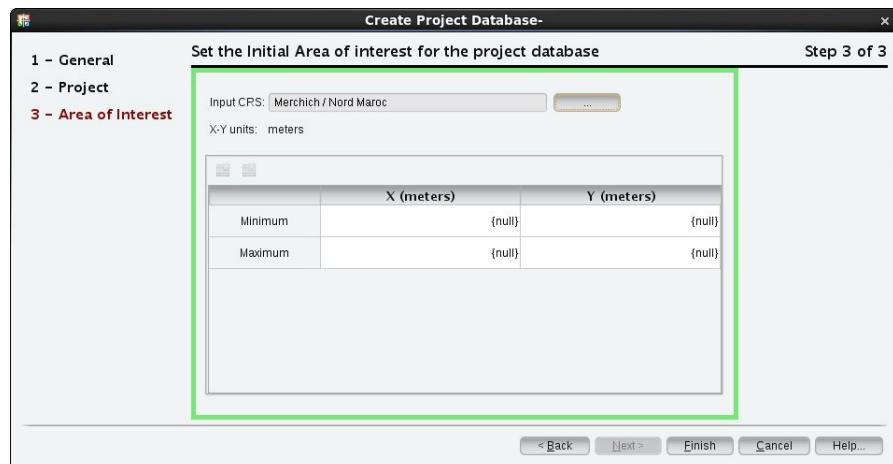
Enter degrees (^), minutes ('), and seconds (") in the text boxes that describe the extent of the area of interest. The latitude degrees boxes can contain values from -90 to 90, and the longitude degrees boxes can contain values from -180 to 180. Negative degrees indicate locations to the south of the equator or to the west of the prime meridian. You cannot enter negative values in degree boxes. Instead, use the drop-down menu to select S in a Latitude text box, and W in a Longitude text box.

The minutes box can contain 0 to 59. The seconds box can contain values from 0 to 59.99.



Projected

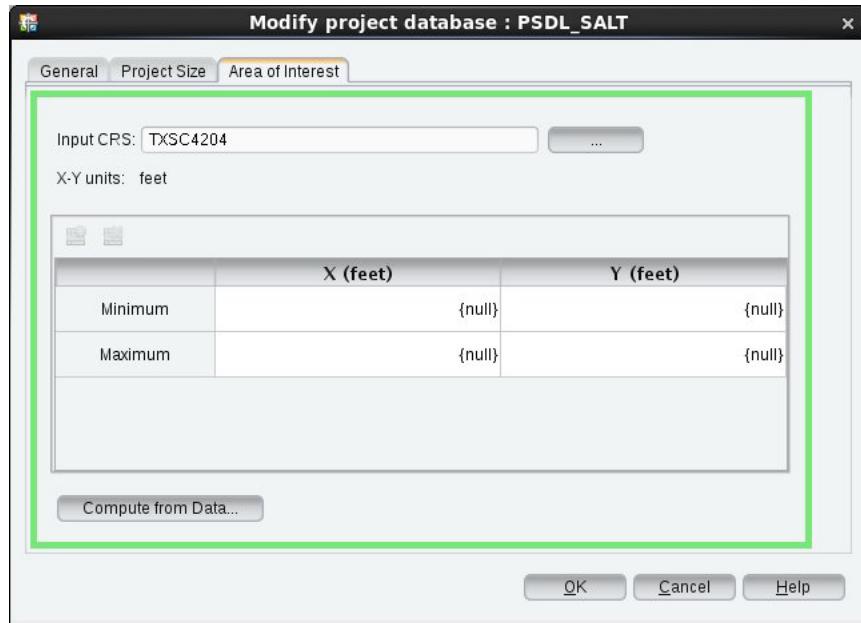
If the coordinate system is projected, enter **Minimum** and **Maximum X** and Y coordinates in each text box. Values will be in the surface measurement system of the Input CRS.



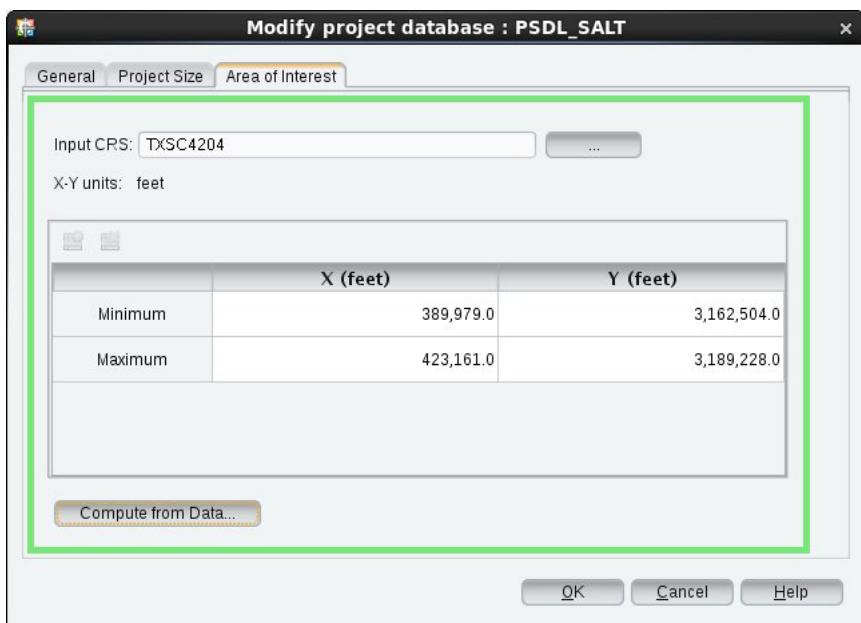
If you choose not to specify an areal extent, OpenWorks software automatically sets the extents to include all of the data loaded to the project. You can also calculate new extents after the project has been created by using the Project Modify feature.

1. Select **Project > Project Database > Modify**.

2. Select the **Area of Interest** tab.



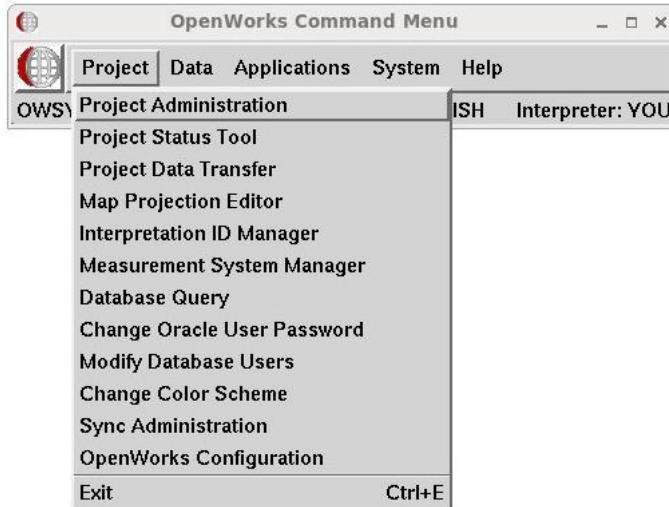
3. Click **Compute from data**.



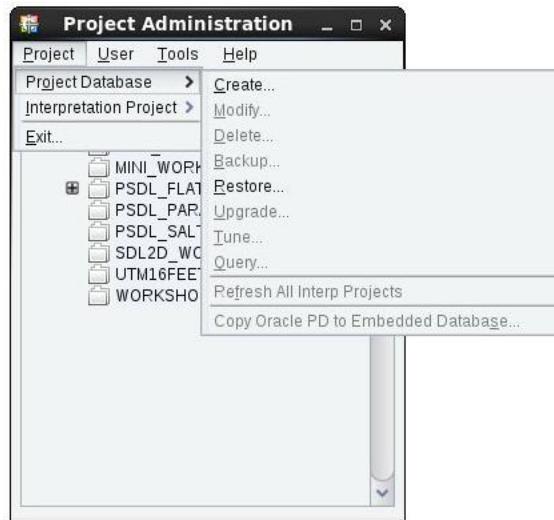
Optional Exercise: Creating a Project Database

The following example takes you step-by-step through the process of creating an OpenWorks Project called FLDR.

1. From the OpenWorks command menu, Start Project Administration, **Select Project > Project Administration**



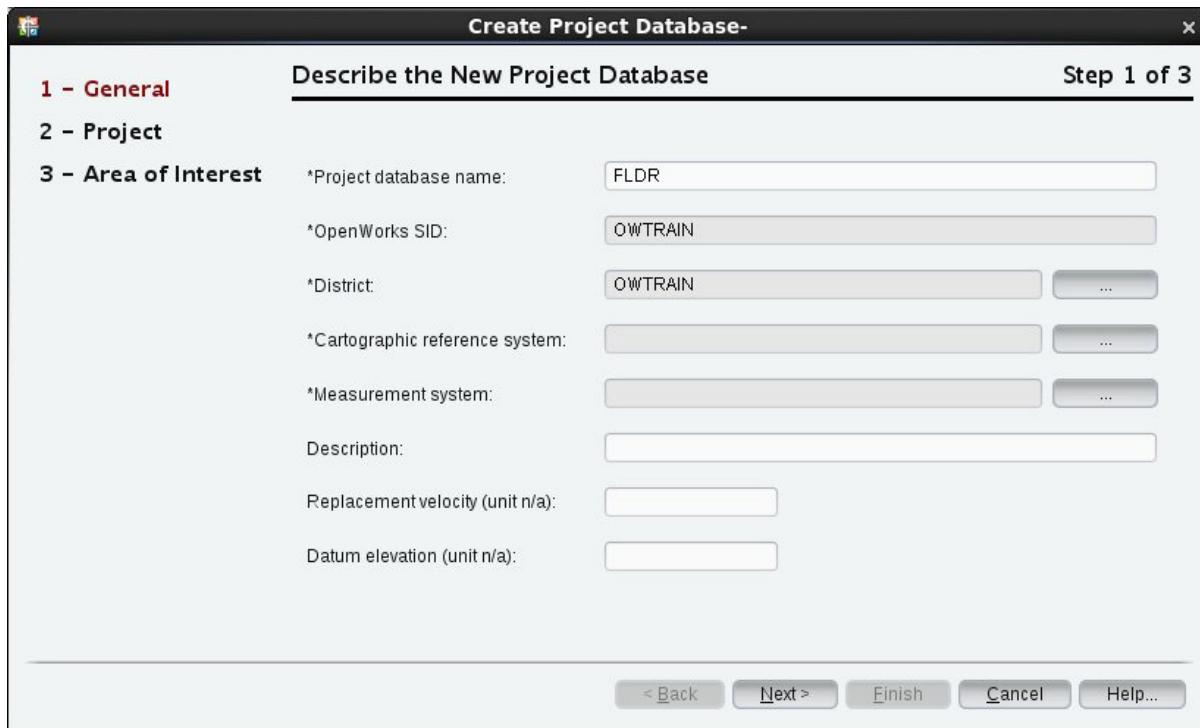
2. Select **Project > Project Database > Create...** to open the Project Create dialog box.



The Create OpenWorks Project Wizard dialog displays with the *Describe the new project database* pane (or General pane).

3. In the Describe the new project database pane, select (click the **List** button () next to the instance field and select from the list) or fill out the following information for the project.

- **Project database name:** FLDR
- **OpenWorks SID:** select the SID (will change at each location - ask your instructor)
- **District:** Select the district (will change at each location - ask your instructor)

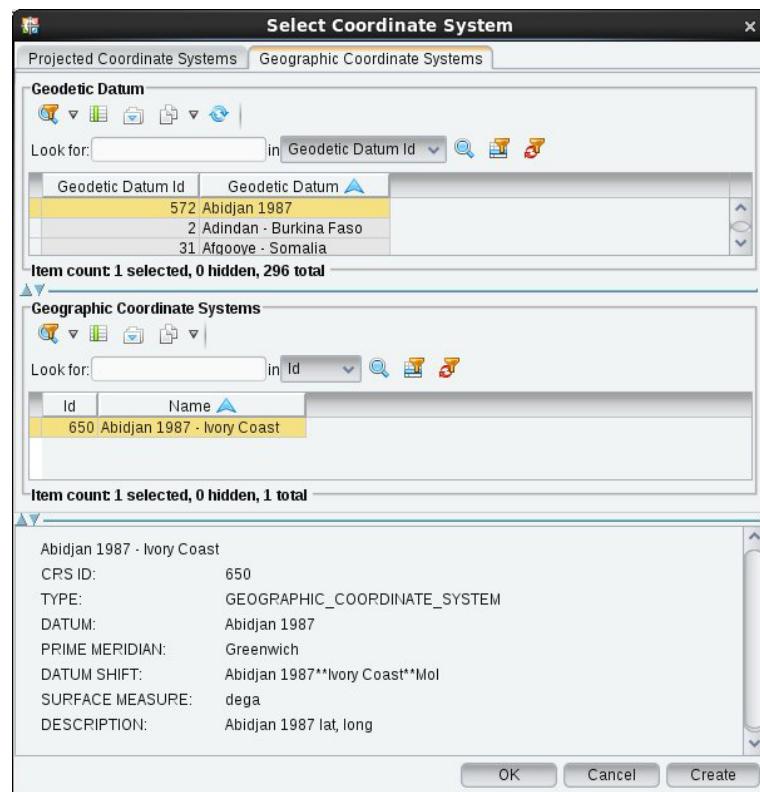
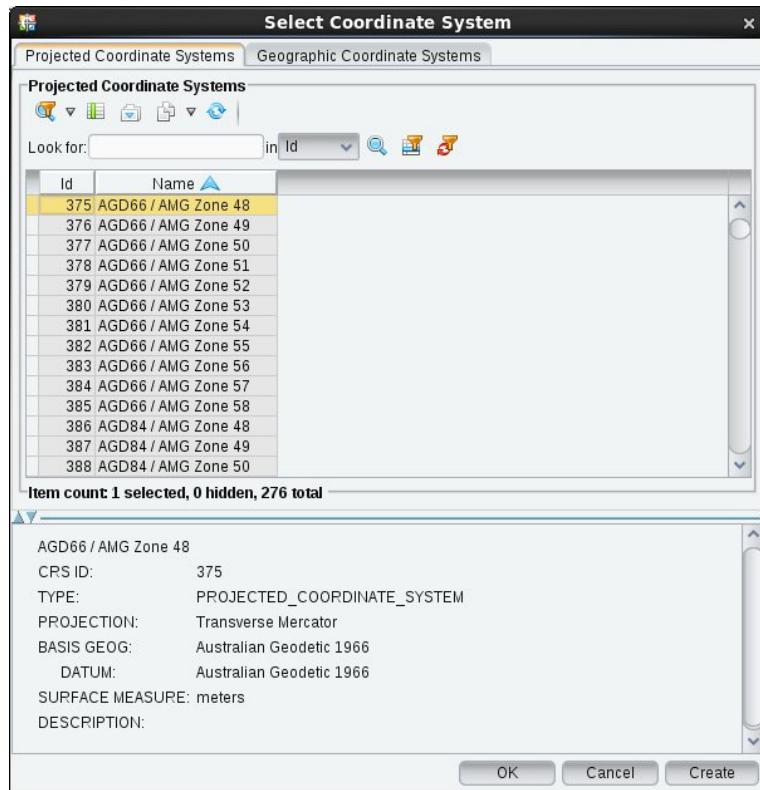


- Type a brief description in the Description field if desired.

To begin a new line in the Description field, you must use the **Enter** key.

4. Click the **List** () button next to the Cartographic Reference field.

You will see the CS Selection dialog box, similar to the one shown below.



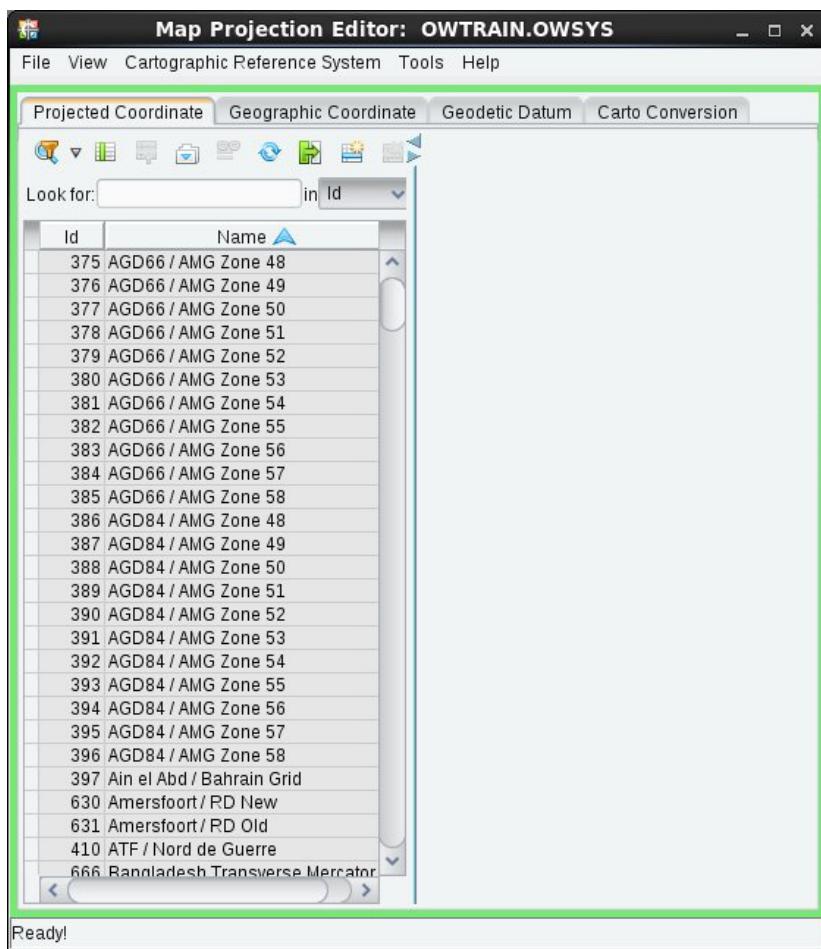
Note

If the Cartographic Selection that you wish to use already exists, proceed to the selection step (Step 4).

If the desired CRS for the project does not exist, create it with the following steps.

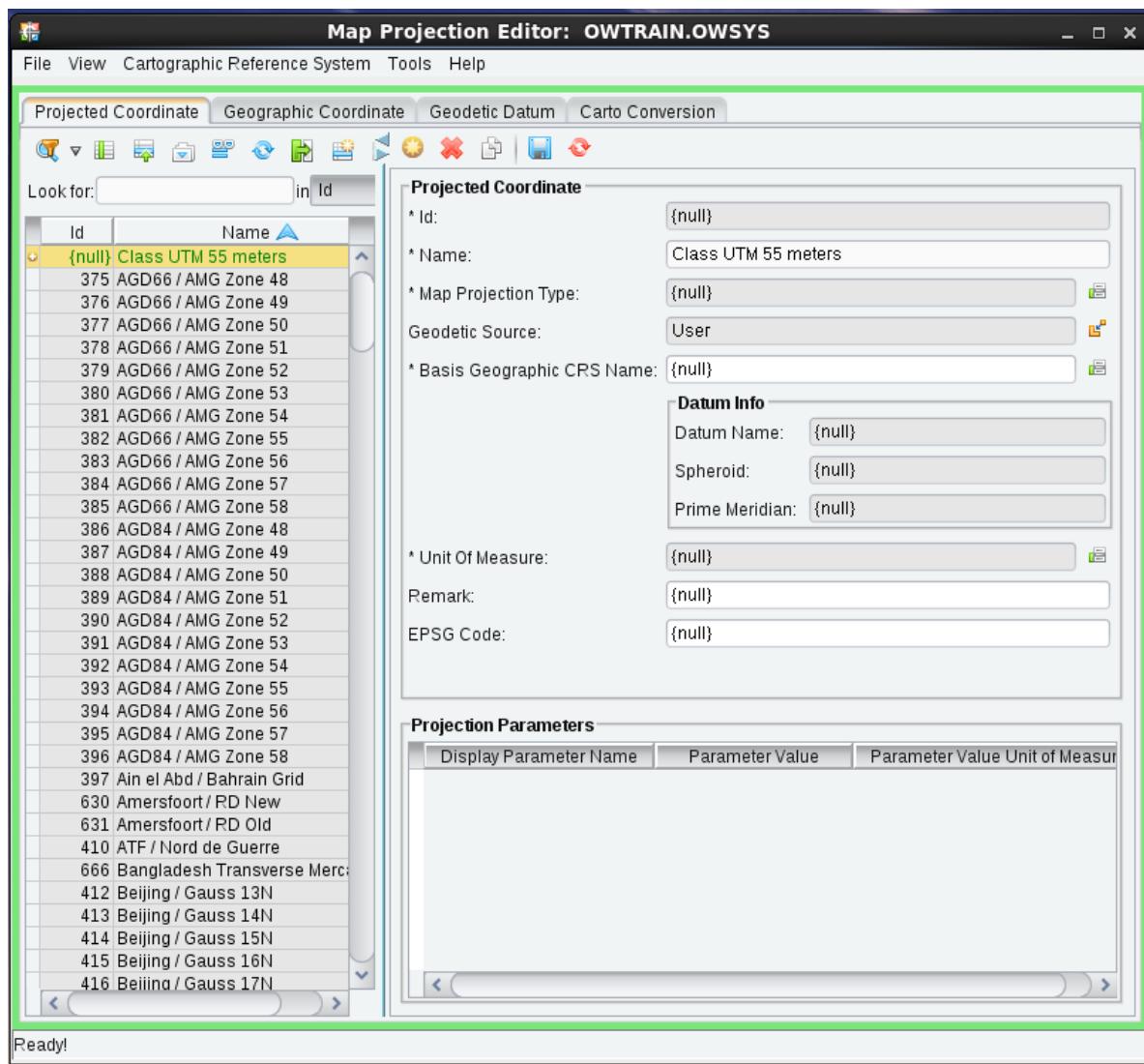
5. Click the **Create** button.

The *Map Projection Editor* window appears.

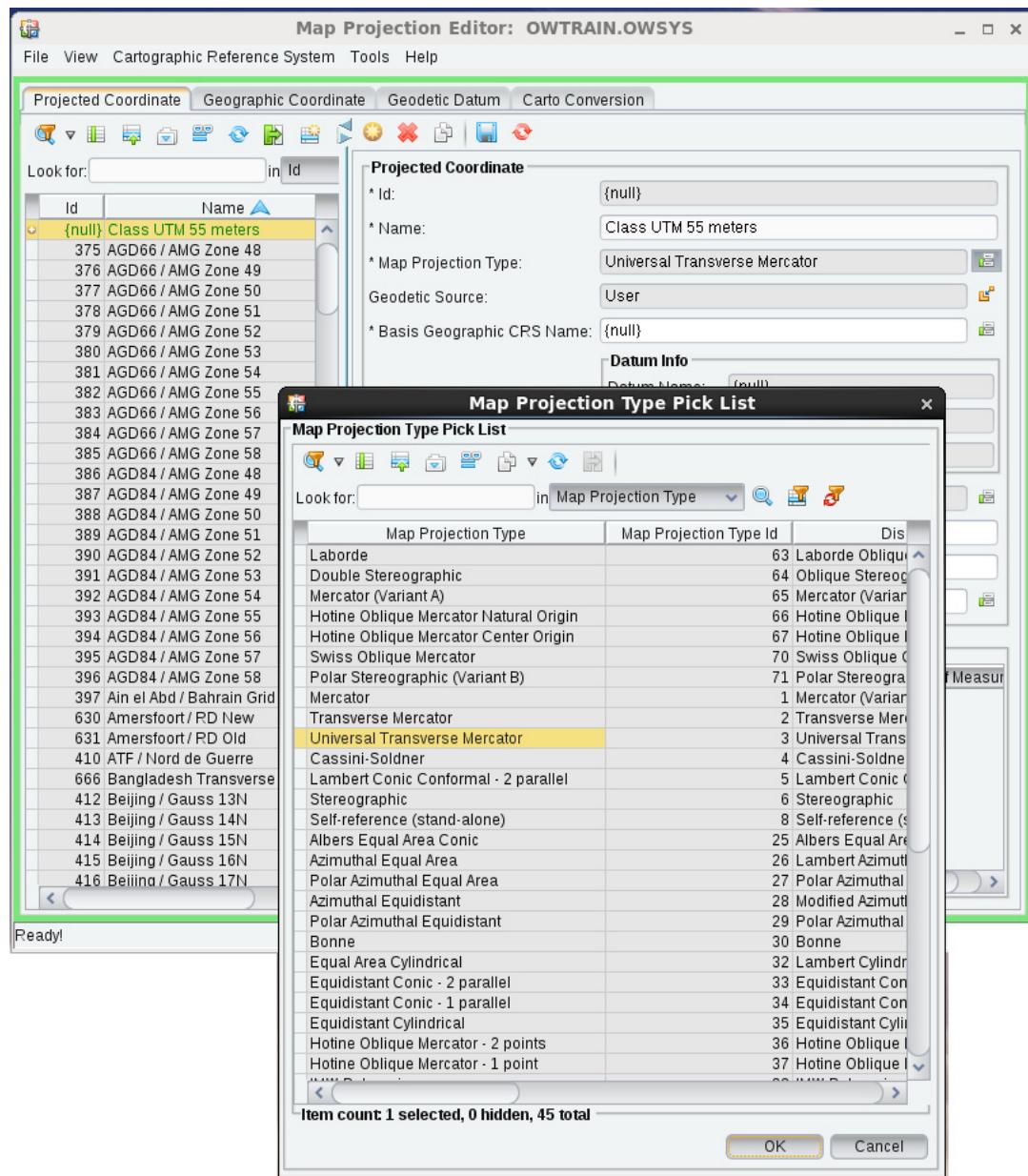


6. Select **File > New Projected Coordinate** to open the *Map Projection Editor*.

7. Enter **Class UTM 55 meters** in the **Name** field.

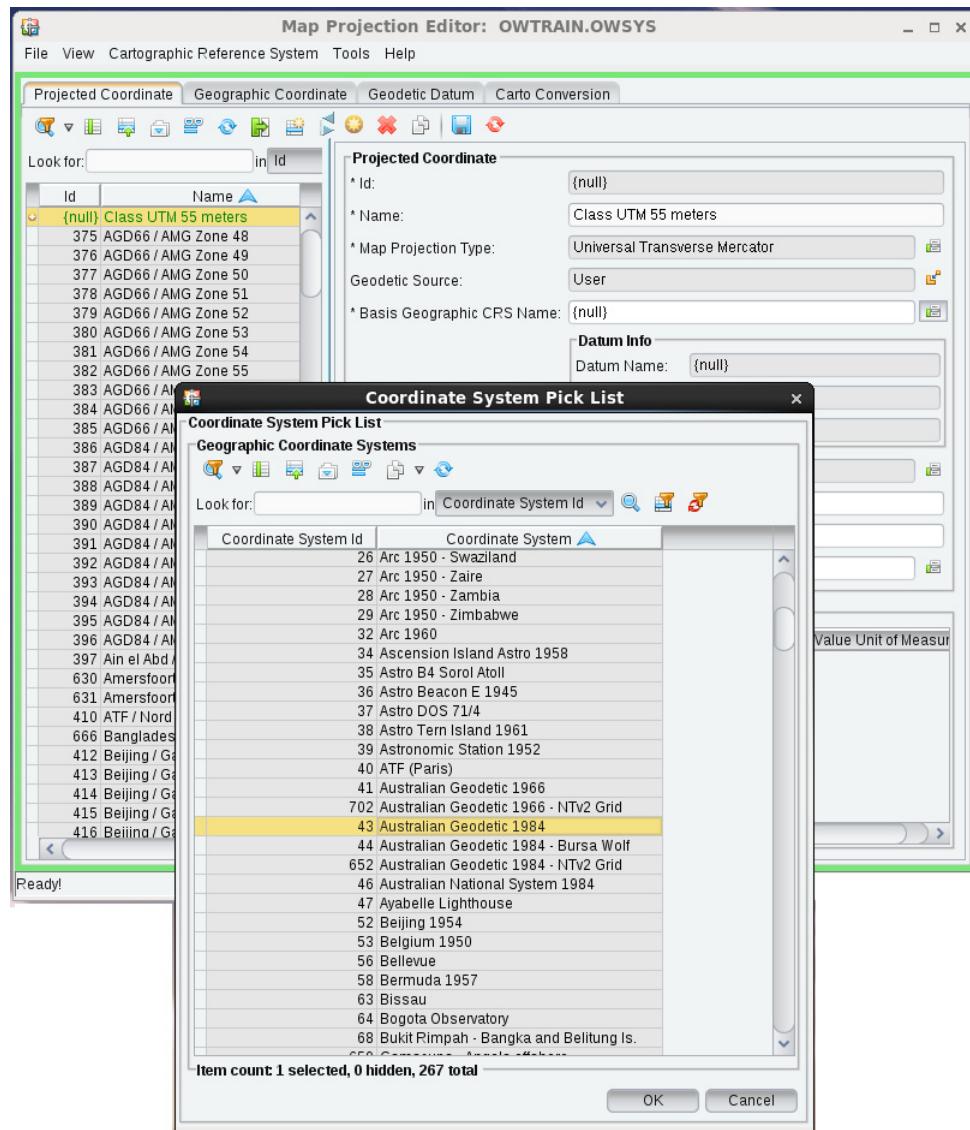


8. Click the **List** icon () adjacent to **Map Projection Type** and select **Universal Transverse Mercator** from the list.

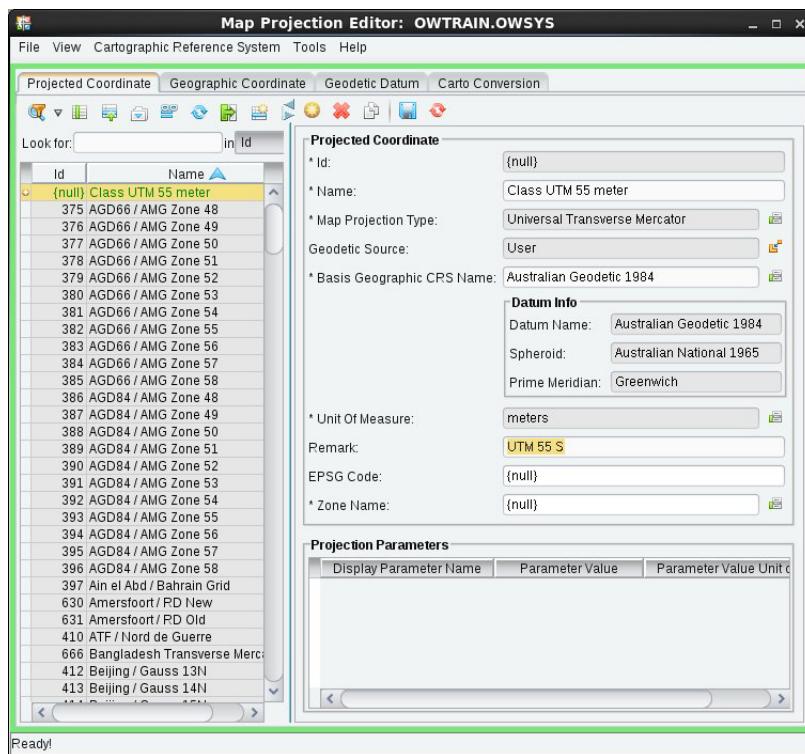


9. Click the **OK** button.

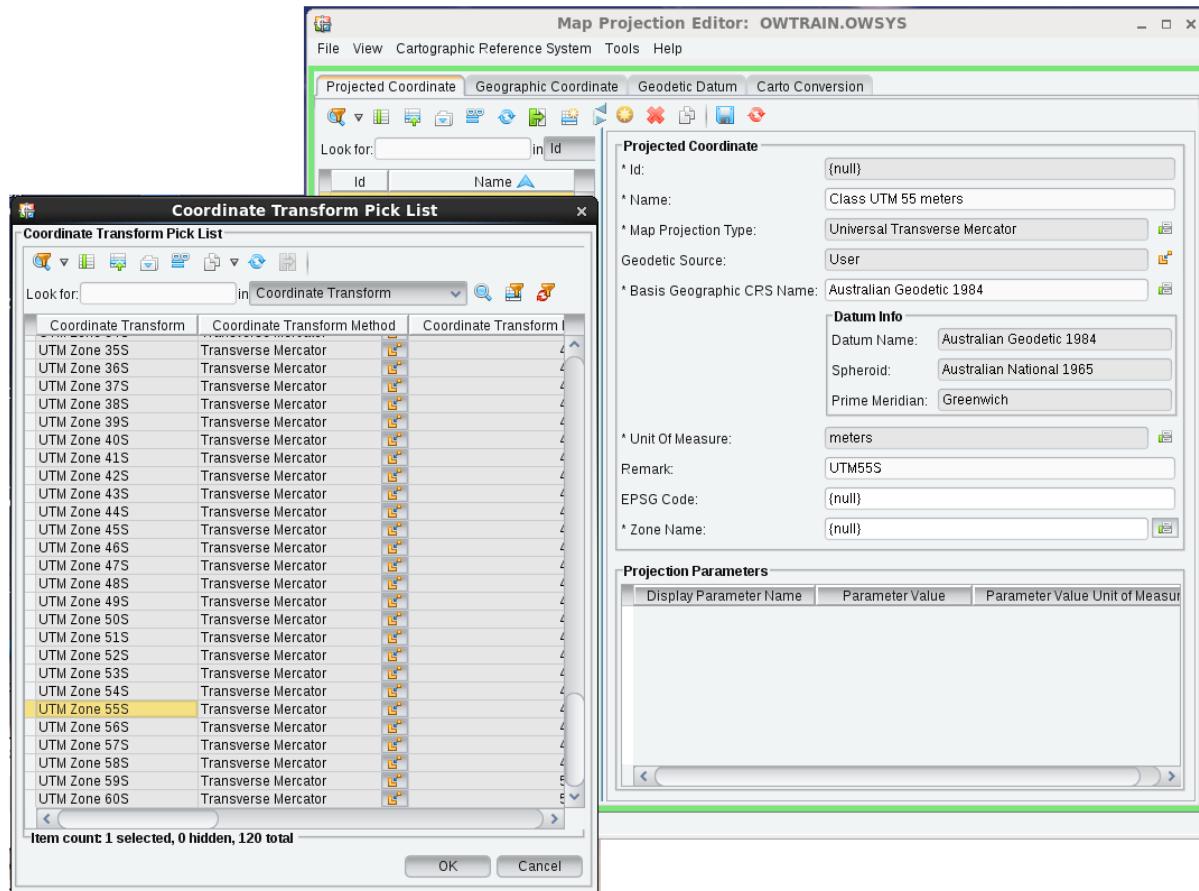
10. Click the **List** icon () adjacent to **Basis Geographic CRS Name** and select **Australian Geodetic 1984** from the list. Click the **OK** button.



11. Enter **UTM 55 S** in the **Remark** field.

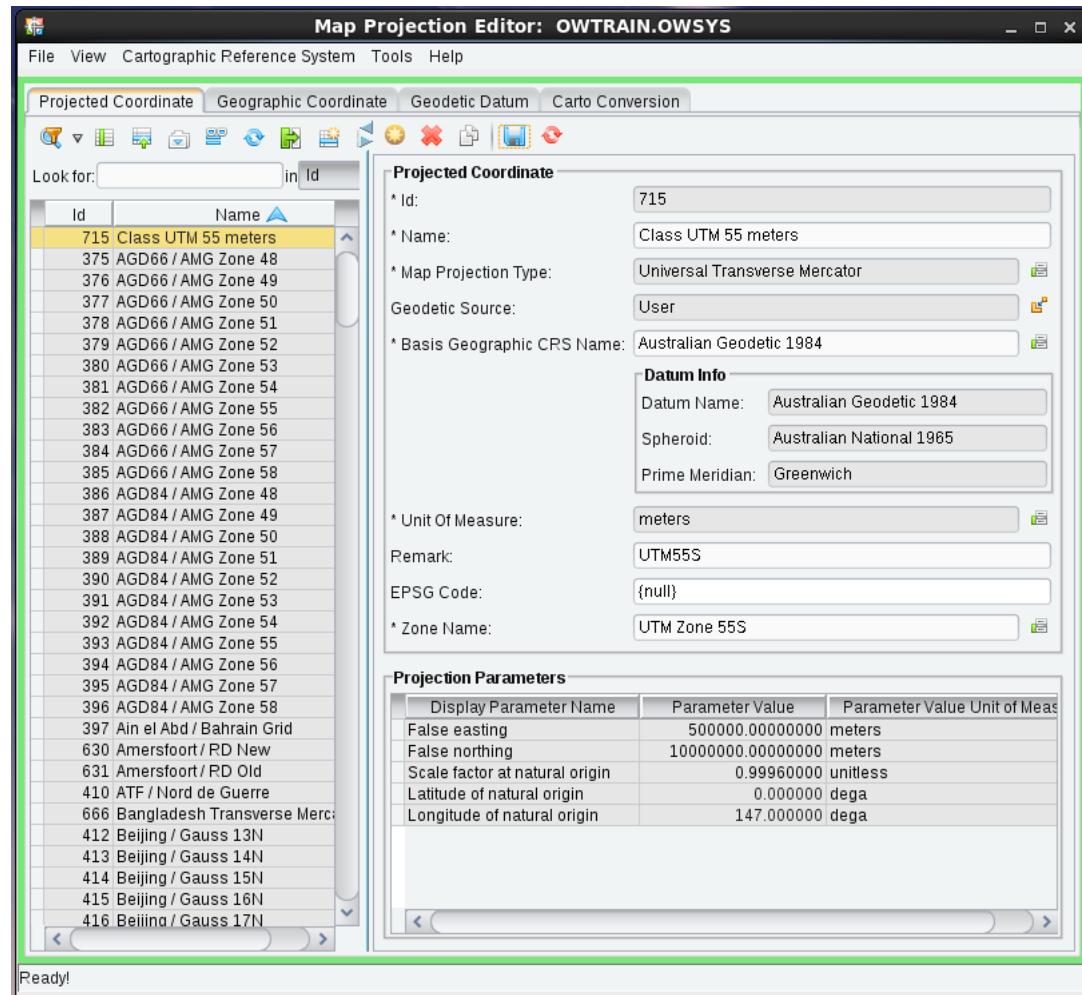


12. Click the List icon () adjacent to the **Zone** field. Select **UTM Zone 55 S**. Click the **OK** button.



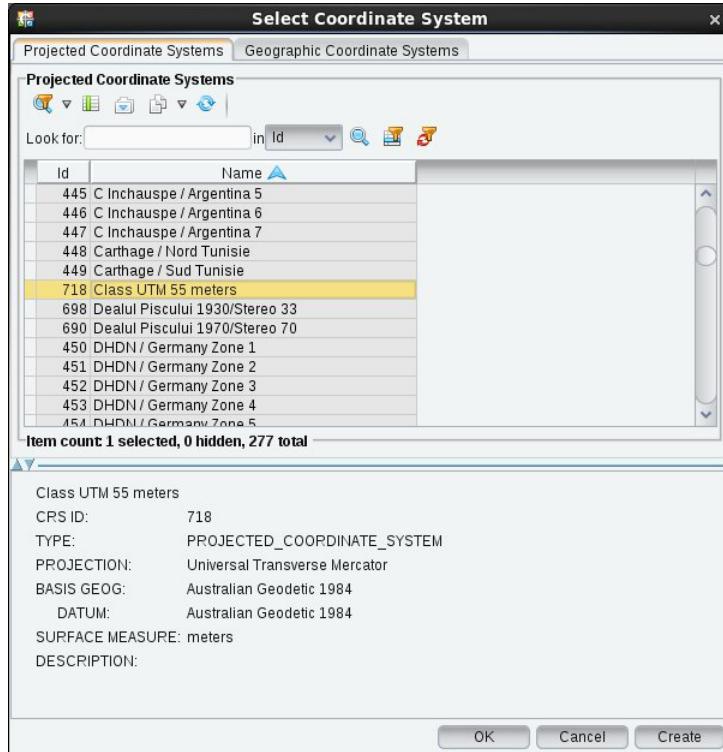
13. Save the information.

The *Map Projection Editor* window displays the updated information.



14. Select **File > Close** to exit.

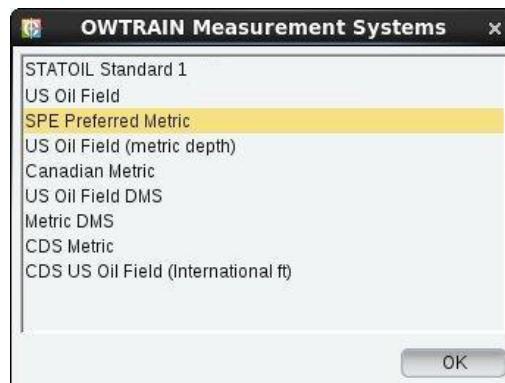
The *Select Coordinate System* window appears.



15. Select **Class UTM 55 meters** from the *CS Selection* dialog box.

16. Click **OK**.

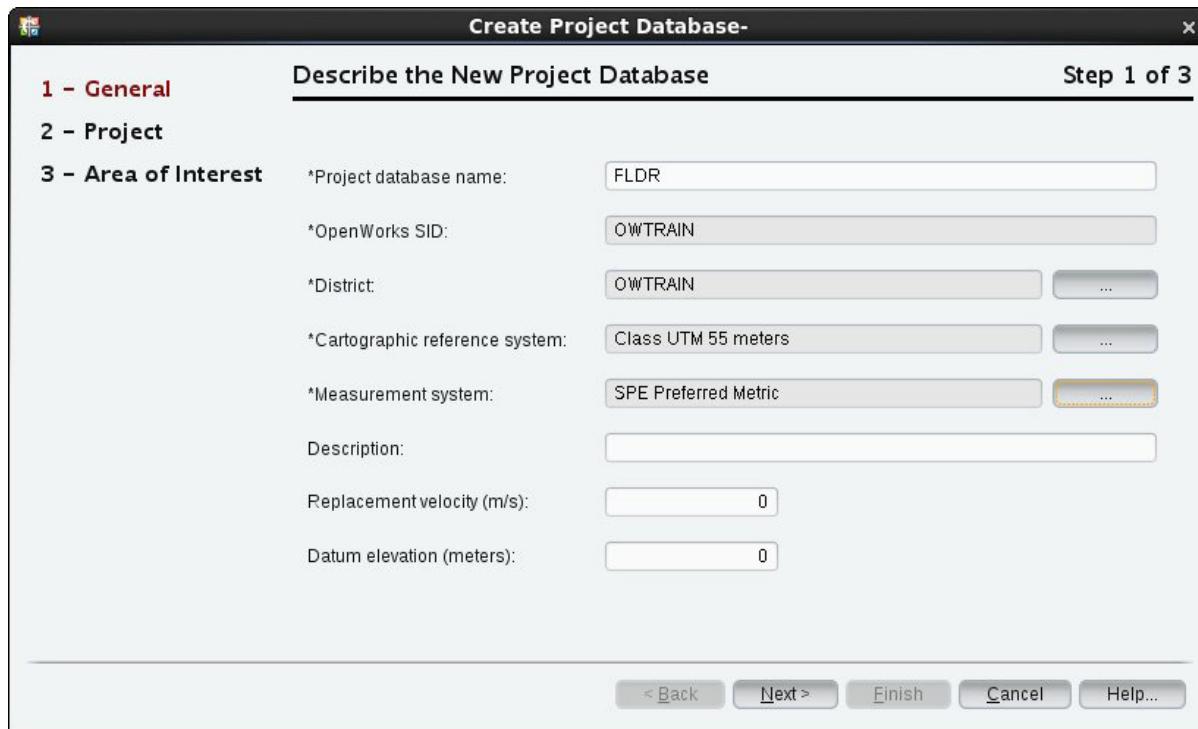
17. Click the **List** icon () to select the default unit of measure for this project.



18. Select **SPE Preferred Metric** from the list.

19. Click **OK**.

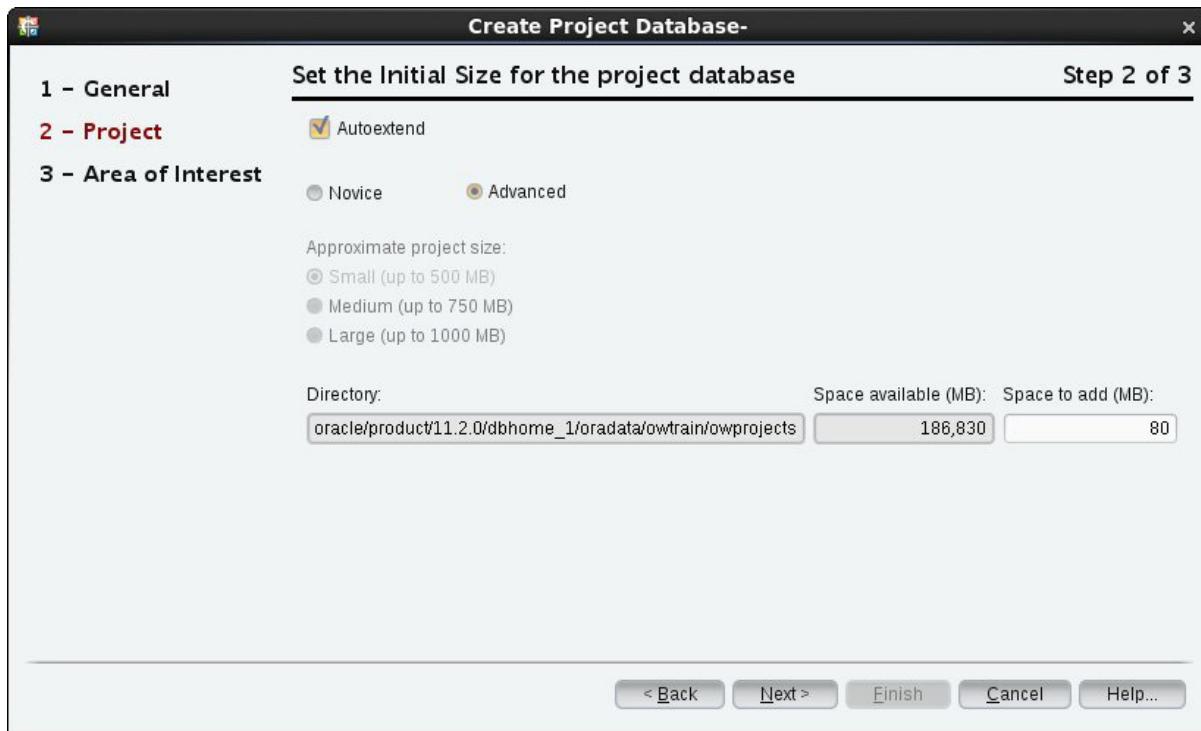
The *Create Project Data* window appears.



20. Optionally, enter a description about the new project database in the **Description** field.

21. Enter **1500** in the **Replacement velocity (m/s)** field.

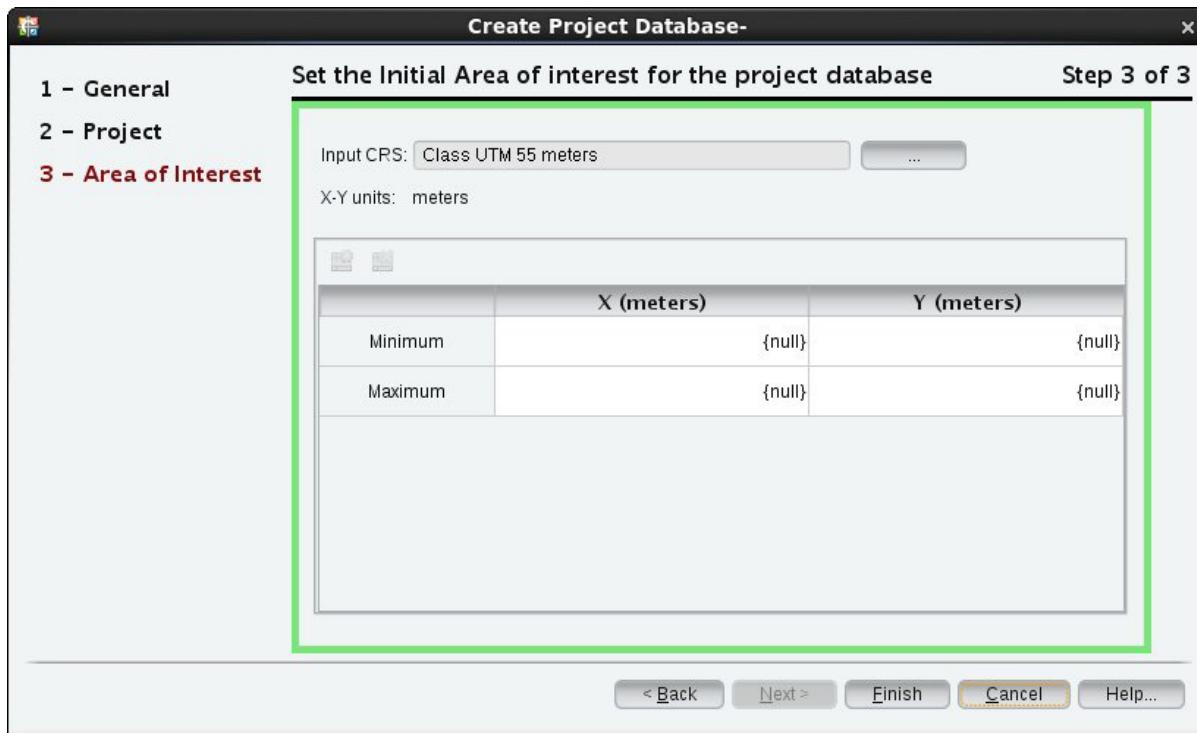
22. Click **Next**.



23. Select the **Advanced** radio button.

24. Enter **80** in the **Space to add (MB)** field.

25. Click **Next**.

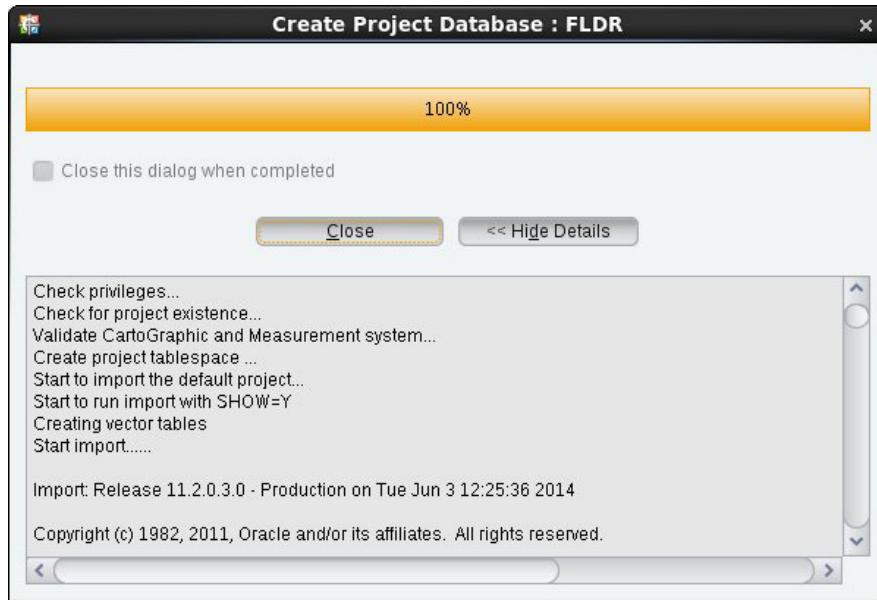


26. You don't need to specify the minimum and maximum coordinates (project area will encompass the data loaded). If you do specify the coordinates, they should match the selected Input CRS (defaults to the project CRS).

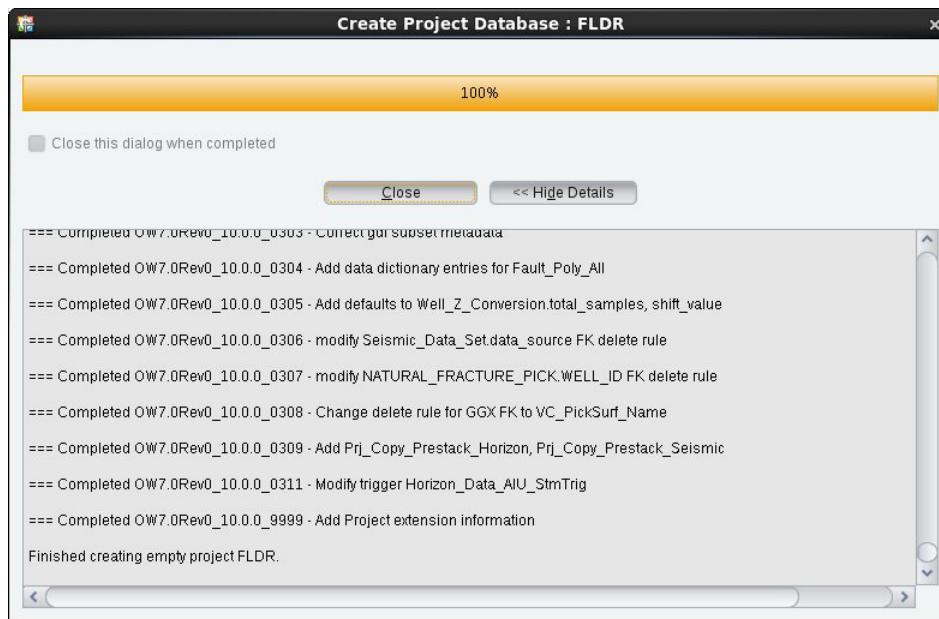
27. Click **Finish** to start project creation.

The program checks to make sure all of your entries are valid and that this project does not already exist. If there is a problem, an error message appears and you must correct the problem before the program can begin building the project database.

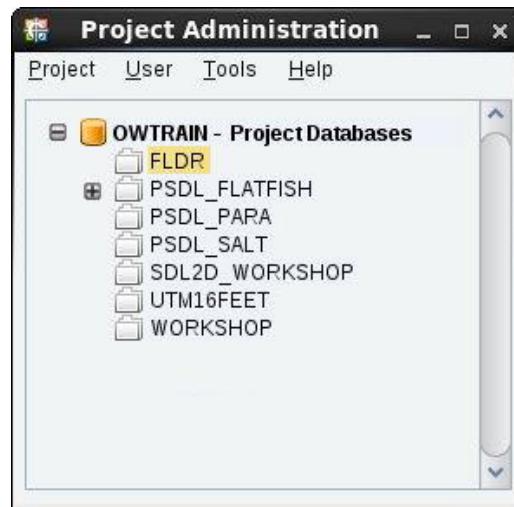
When the project database is being created, the following message appears.



It may take several minutes to create this project. When the project creation process is complete, the following message window appears.



If the database is created successfully, you will find it in the databases list in the *Project Administration* window.



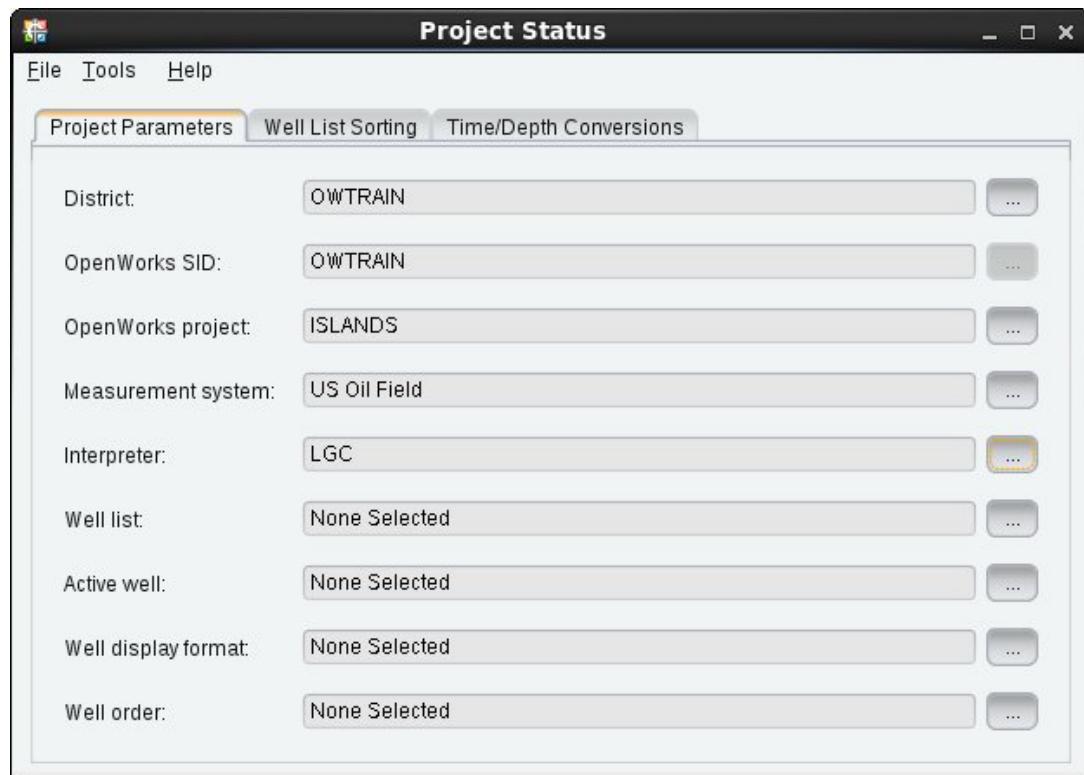
Appendix E

Project Status Tool

The Project Status Tool allows you to set the OpenWorks district, OpenWorks SID, project, measurement system, interpreter, well list, active well, well display format, and well order to use during an OpenWorks session. In addition, you can change the sorting methods used to display wells and well lists, or change the format for displaying well names and related well identifiers. You can also save favorite settings in a session file.

The Project Status Tool has three tabs:

- **Project Parameters** - allows you to set the OpenWorks district, OpenWorks SID, project, measurement system, interpreter, well list, active well, well display format, and well order to use during an OpenWorks session.
- **Well List Sorting** - allows you to set the sorting method used to display the names of well lists.
- **Time/ Depth Conversions** - allows you to set depth-to-time conversion preferences project wide for converting depth data to time data (or depth-to-depth) during a session. Also allows you to specify whether the use of the depth-to-time data of the well overrides the method selected in the Project Status Tool tab. These preferences are stored in the OpenWorks instance for each interpreter of a well data.



Exercise: Setting Project Status Tools

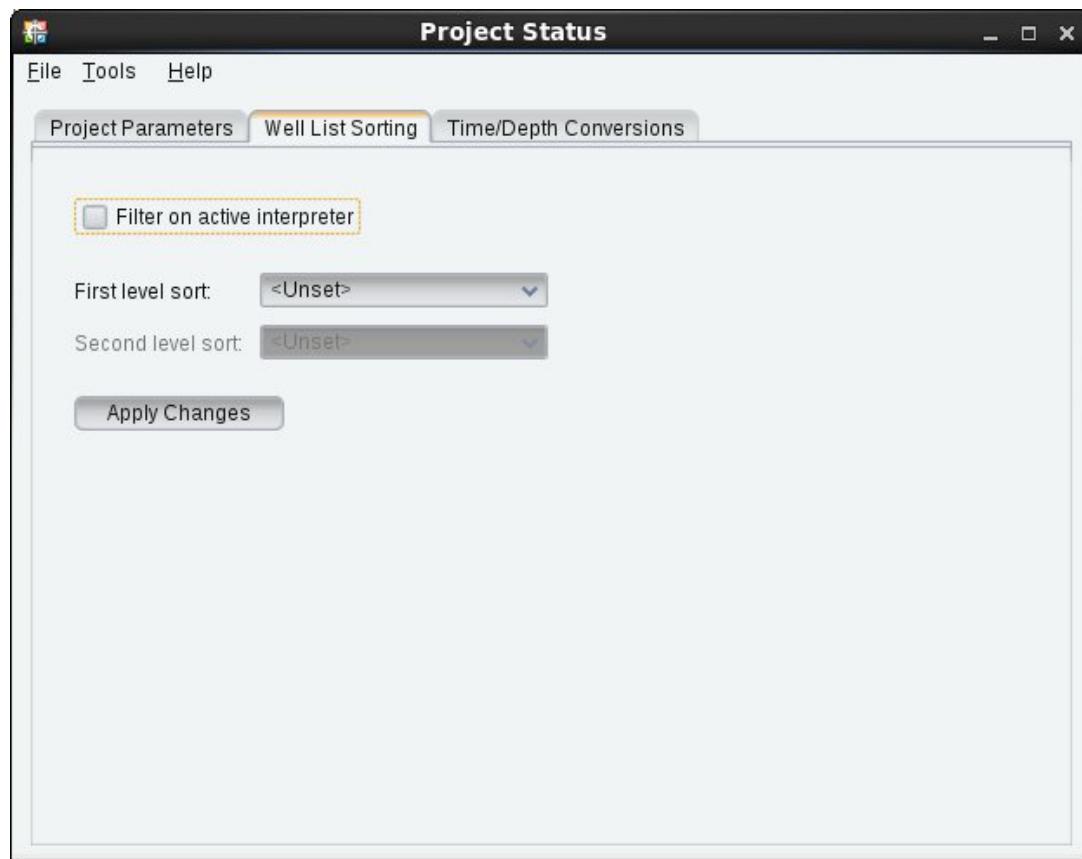
1. Launch the **Project Status** tool.

From the OpenWorks Command Menu, select **Project > Project Status**.

2. Set the Project Parameters:



3. Leave the **Well List Sorting** options as default as well data is not available in this project.



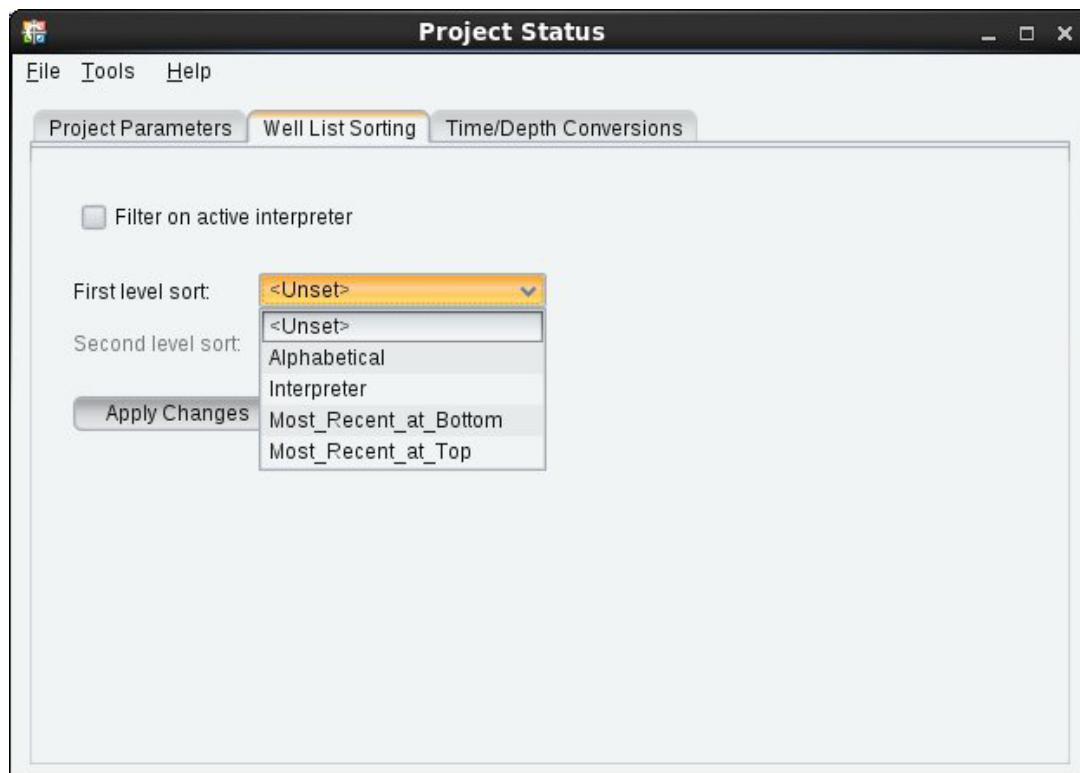
Using the Well List Sorting Tab

The Well List Sorting tab in Project Status Tool allows you to change the sorting method used to display the names of well lists:

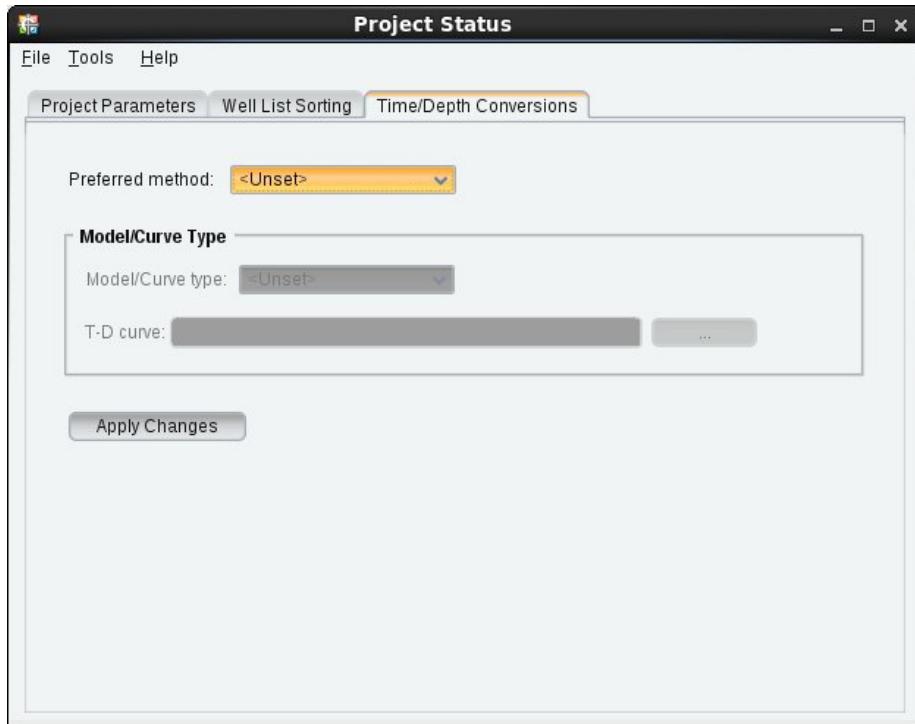
- Select the **Filter on Active Interpreter** check box. The OpenWorks software filters well lists on the active interpreter and removes Interpreter as a sorting option in the **First Level Sort** drop-list.
- Select one of the following from the **First Level Sort** drop-down list:
 - **Alphabetical** - controls the display of alphanumeric names. It sorts the numeric names first and then the alphabetical names.
 - **Most_Recent_at_Bottom** or **Most_Recent_at_Top** - Both

these options sort the wells based on the dates when the well lists were created.

- Selection activates the **Second Level Sort** drop-down list. If you wish, you can select a secondary sorting method from this drop-down list.
- Click **Apply Changes**. The selected methods are posted on the corresponding fields in the *Project Status Tool* window.



1. Leave the **Time/Depth Conversions** options as default as well data/velocity model is not available in this project.



Using the Time/Depth Conversions Tab

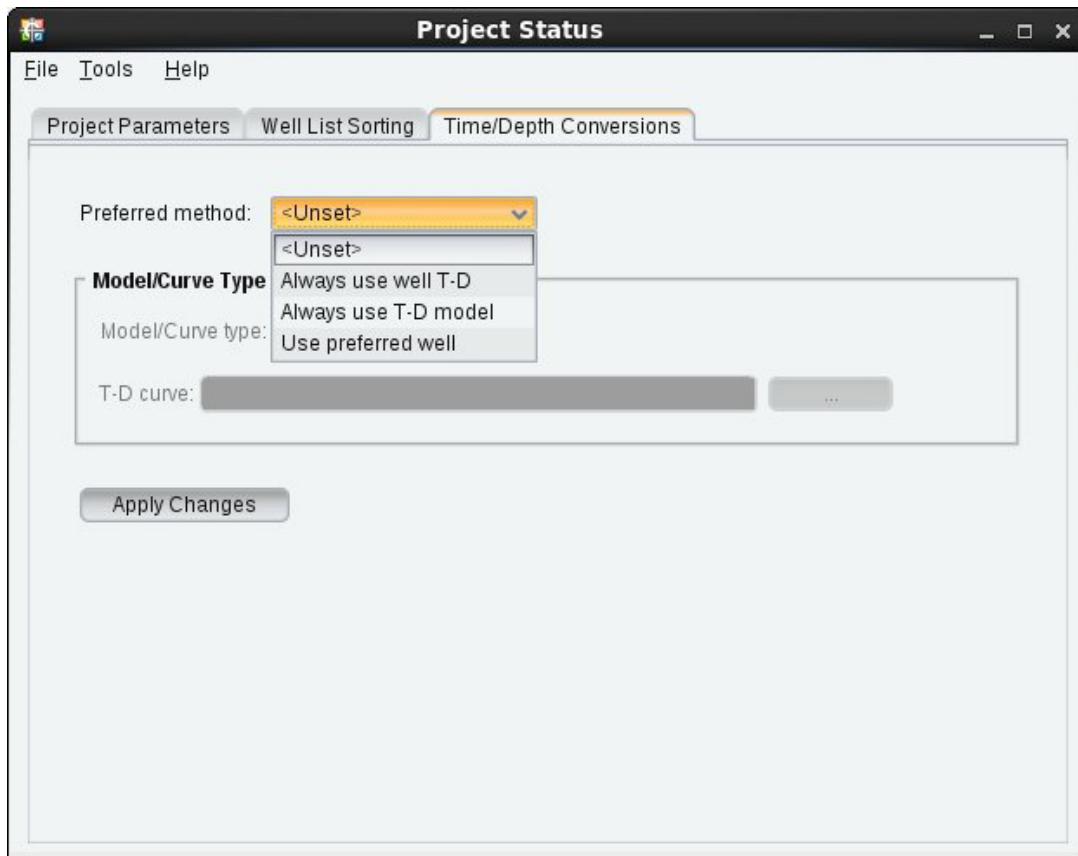
The depth-to-time conversion preference allows you to set a project-wide method for converting depth data to time data (or depth-to-depth) during a session and allows you to specify whether the use of the depth-to-time data of the well overrides the method selected in the Project Status Tool tab. These preferences are stored in the OpenWorks instance for each interpreter of a well's data.

If you change the OpenWorks project in the Project Parameters panel, the Project Status Tool deletes your depth-to-time preferences (in effect, entering None Selected in the text boxes in the Time/Depth Conversions panel).

To select a preferred method for depth-to-time conversions of well data, do the following:

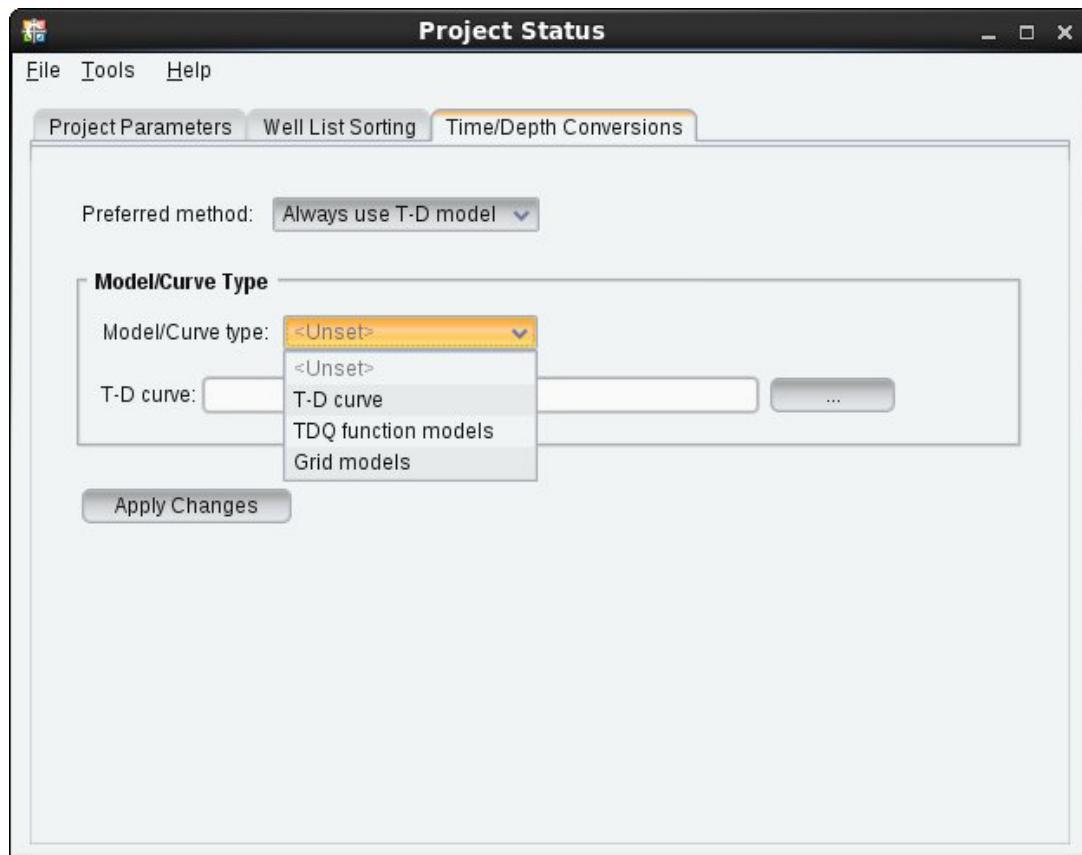
- Select one of the following from the **Preferred** method drop-down list:
 - **Unset**: When selected, the OpenWorks applications behave as they did before you make a time-depth preference in the Project Status Tool. The OpenWorks software prompts you when:
 - 1) You launch an OpenWorks application that uses T-D curves.
 - 2) If the well data has Time_Priority (or Depth_Priority) set in a saved session, some applications may request that you select a depth-to-time preference.
 - **Always Use Well T-D**: When selected, the applications will use the depth-to-time (or depth-to-depth) curve associated with a well.
 - **Always Use T-D Model**: When selected, the applications will use the depth-to-time (or depth-to-depth) model or curve that you have selected in the Model/Curve Type area of this panel.

- **Use Preferred Well:** If you select this option, the OpenWorks applications will use the depth-to-time (or depth-to-depth) curve associated with a well; however, if working with an existing session that has this option set, the applications will use the depth-to-time (or depth-to-depth) model or curve that you had selected in the Model/ Curve Type drop-down list.



- If you selected **Always Use T-D Model** or **Use Preferred By Well**, do the following:
 - Select one of the options from the **Model/Curve Type** drop-down list:
 - 1) **T-D Curve:** Selects a time-depth curve created in another application, such as the SynTool software.
 - 2) **TDQ Function Models:** Selects a velocity model built from time-depth functions by the TDQ software.

- 3) **Grid Models:** Selects a compressed grid velocity model created in another application, such as the DepthTeam Interpreter software.
- Click the **Browse** button (...) adjacent to the option you selected. A dialog displays. If the project does not have the type of conversion curve or model that you selected, the OpenWorks software displays an information message. You may need to change projects or make sure that the conversion curve or velocity model is a part of the project that you selected. If the project has the type of conversion curve or model that you selected, select the name of the curve or model and click **OK**.



- Click **Apply Changes** in the Time/Depth Conversion panel. OpenWorks applications that use T-D curves will use the time-depth conversion method as specified.
2. After you specify details in the three tabs, you can use the Tools menu to save the application preferences as your default preferences (Application Preferences as User Default) or save the

application preferences (Save Application Preferences) by specifying a name. The OpenWorks software saves application preferences as an XML file.



Appendix F

vi Editor Survival Kit

Command Mode: The initial and normal mode. You can enter any subcommands except those for Insert Mode. Other modes return here. Press the Esc key to cancel a partial subcommand.

Insert Mode: You insert text in this mode. Use one of the Mode subcommands to enter into Insert Mode from the Command Mode. Once in the Text Mode, you can enter arbitrary text. To return to the Command Mode, press the Esc key or Ctrl-C.

Last Line Mode: You enter into this mode when you select a subcommand that begins with a colon (:), slash (/), or question mark (?). The vi editor places the cursor at the bottom of the screen where you enter the rest of the subcommand. Press ENTER to run or Ctrl-C to cancel the command.

| CURSOR MOVEMENT | | | | MODES | | | |
|--------------------|--|---|---|----------------------|--|--|--|
| k | | ↑ | | i | Insert before cursor | | |
| h | l, spc | ← | → | I | Insert before first char. on line | | |
| j | | ↓ | | a | Append after cursor | | |
| | | | | A | Append to end of line | | |
| | | | | o | Adds empty line below | | |
| | | | | O | Adds empty line above | | |
| UNDO LAST EDIT | | | | PAGING | | | |
| Esc u | if in edit mode | | | Ctrl-F | Scroll forward by one page | | |
| u | if in command mode | | | Ctrl-B | Scroll backward by one page | | |
| CURSOR POSITIONING | | | | REPLACING TEXT | | | |
| 0 | (Zero) beginning of line | | | cc | Change entire current line | | |
| \$ | End of line | | | cw | Change word | | |
| #G | Go to line number # | | | r | Replace one character | | |
| # | Go to line number # | | | C | Change to end of line | | |
| # | Go to column number # | | | R | Replace text with new text | | |
| DELETING TEXT | | | | WORD/SCREEN MOVEMENT | | | |
| x | Delete character, save in undo buffer | | | b, B | To previous small, big word | | |
| dw | Delete word, save in undo buffer | | | w, W | To next small, big word. “Big” words are space separated | | |
| dd | Delete line, save in undo buffer | | | H, M, L | Move to top, mid, last screen line | | |
| D | Delete rest of line, save in undo buffer | | | z . | Center screen at present line | | |
| COPY/PASTE | | | | MISCELLANEOUS | | | |
| yy, Y | Copy line into undo buffer | | | ~ | Change letter to opposite case | | |
| yw | Copy word into undo buffer | | | /pat | Forward search for pattern pat | | |
| y) | Copy sentence into undo buffer | | | ?pat | Search backward for pattern pat | | |
| y{ | Copy paragraph into undo buffer | | | n | Repeat prior search | | |

| | | | |
|------------------------------------|---------------------------------|---------|---------------------------------------|
| p | Paste undo buffer after cursor | J | Join current line with next line |
| P | Paste undo buffer before cursor | Ctrl-V | Quotes next character |
| EXIT/SAVE/ABORT/INSERT FILE | | | |
| :w | Write edits to file | :q! | Quit without saving edits |
| :wq | Write edits and quit | :wq xxx | Save edits to file xxx and quit |
| ZZ | Write edits and quit | :r xxx | Insert contents of file xxx at cursor |

Common UNIX Commands

Introduction

The OpenWorks® software allows you to create, open, and save most files from within dialog boxes. You simply select the appropriate dialog box options without specifying pathnames for the files. In this sense, the file structure is transparent to the user. This simplicity is useful in that it suppresses information that is not immediately relevant to the act of interpretation. It frees you to concentrate on interpreting the data without regard for how or where it is stored.

However, as you interpret data and work with projects, you will encounter situations that require you to know how to manipulate files at the system level. For example, you may need to obtain information about the size of a file, locate a file within the file system, or modify a file. Likewise, you may need to change the permissions assigned to a particular file or move a file from one directory to another. These are tasks that cannot be performed from within the OpenWorks dialog boxes. They must be performed from an xterm using one of the following types of file management tools.

- Unix commands
- Text editor

Unix Commands

The Unix system is an interactive operating system that allows computer resources to be shared by multiple users on a limited basis.

Currently, the OpenWorks software runs only on workstations that use some version of the Unix operating system.

The following section provides a summary of some of the most useful Unix commands for managing your OpenWorks files and your system resources. A few of these commands may not work on your particular system, since different types of workstations use different versions of Unix. However, most Unix commands are common to all versions of Unix.

Most Unix workstations have an online manual that provides descriptions and parameters for the Unix commands available on the system. You can display the manual pages for a particular command by typing “man” followed by the command at the system prompt of an xterm.

The Unix commands¹ discussed in this section are grouped by the following tasks:

- Examining system resources
- Creating, displaying, and managing file directories
- Examining, manipulating, and printing files

Note

In the commands listed in this chapter, an item enclosed in brackets [] is optional. You can omit it if you wish. An item enclosed in <> is a variable which you supply. For example, <filename> means to insert the name of a specific file.

1. Most of the information about these commands has been derived from the Unix man pages for the Sun Release 4.1 or from the *AT&T Unix System V User's Guide* published by Prentice-Hall, Inc., Englewood Cliffs, NJ 07632.

Wildcard Symbols

Most Unix commands can be used with wildcard symbols that represent one or more unknown characters. These symbols are useful for managing multiple files with common character strings or for locating files.

| Wildcard | Description | Example |
|----------------|---|--|
| * | Represents any unspecified string of characters of any length. | The string *.asc could be used to specify all files with an extension of .asc. |
| ? | Represents any unspecified single character in a character string. | <p>Suppose you have several graphics files that are named as follows:</p> <ul style="list-style-type: none"> • figure1.xwd • figure2.xwd • figure3.xwd <p>and so on.</p> <p>You could use the string figure?.xwd to specify all of these files in a Unix command.</p> |
| [<characters>] | Specifies a set of characters, any one of which will satisfy a pattern matching operation | <p>Suppose you have a project named “ajax.” The project’s seismic files are named ajax.3dh and ajax.3dv. You want to list these files with their file size using the same command. You could use the Unix ls command with the following file specification:</p> <ul style="list-style-type: none"> • ajax.3d[v.h] |

Directory Paths and Symbols

The Unix file system is a structure that resembles an inverted tree. At the top of this structure is a root directory. Proceeding from the root directory is a branching network consisting of descending levels of directories and subdirectories. All directories are linked directly or indirectly to the root directory.

When you use a Unix command, frequently you will have to include a pathname for the directory to which the command applies. You can specify this path as a full pathname. In this case, you specify the entire pathname, beginning with the root directory (/), and proceeding through each consecutive directory level to the directory of interest. An alternative is to use a relative pathname. In this case, you specify the directory relative to the current working directory. Unix provides a limited set of symbols that represent directories.

These symbols can be used in Unix commands in place of the actual directory names. They are described in the table below.

| Symbol | Description | Example |
|--------|---|---|
| / | Full pathname of the root directory | cd / Makes the root directory the current working directory |
| . | (Dot.) Current directory | mv <path><file name> . Moves file from specified directory to the current working directory. |
| .. | (Dot. Dot.) Parent directory (the directory immediately above the current working directory). | cd .. Makes the parent directory the current working directory. |
| ~ | Home directories can also be referred to by the character ~ | cd ~ Takes you to your home directory. Specifies paths starting at your home directory. |

Examining System Resources

Unix provides commands that allow you to query the computer system about current allocation of disk space. These commands are useful for determining whether certain directories are full and whether your system has sufficient swap space to run memory intensive applications such as ZAP! III!

Some of the query commands that you will find useful are described in the following table.

| Unix Command | Function | Syntax/Examples |
|--------------|---|---|
| df | <p>Lists amount of disk space occupied by currently mounted file systems. Also lists the amount of space used, the amount of space available, and how much of the system's total capacity has been used. The names that display in the list of file systems are the names of systems you can access by changing directories.</p> <p>Options:</p> <ul style="list-style-type: none"> • -a List entries for all file systems, including those with zero total blocks. • -i List the number of used and free inodes in the inode table. (The inode table is used for cataloging files.) • -t List disk space occupied by particular types of file systems. You can specify <code>nfs</code> to obtain information about mounted file systems only, or <code>4.2</code> to obtain information about your local system only. | <p>Syntax: <code>df [-a] [-i] [-t <type>]</code></p> <p>Examples:</p> <ul style="list-style-type: none"> • <code>df -a</code> Lists entries for all file systems. • <code>df -t nfs</code> Lists entries for all file systems to which your system is mounted by the network file server. • <code>df -t 4.2</code> Lists entries for your local file system only. |
| dmesg | <p>Gives information about system. This command looks in a system buffer for recently printed diagnostic messages and prints them on the standard output. The messages are those printed or logged by the system when errors occur. If the <code>-</code> flag is used, dmesg prints the new messages that have been logged since the last time that it was invoked to the screen.</p> <p>This message is an effective means of obtaining information about resources such as the system's installed memory and available memory.</p> | |

| Unix Command | Function | Syntax/Examples |
|--------------|--|---|
| du | <p>Lists number of kilobytes used per directory or file. If no option or <file name> is included, only the number of kilobytes used by the current directory is given.</p> <p>Options:</p> <ul style="list-style-type: none"> • -s Only display the grand total for each of the specified <file names>. • -a Generate an entry for each file. | <p>Syntax: <code>du [-as] <file name></code></p> <p>Examples:</p> <ul style="list-style-type: none"> • <code>du -s</code> Displays total disk space for the current directory and its subdirectories. • <code>du -a <file name></code> Displays disk space used by a particular file (in K). • <code>du -a <directory></code> Displays disk space used by each file in a specified directory and its subdirectories. |
| kill | <p>Terminates processes specified by process ID numbers. This command will only work for processes owned by the user (unless the user has invoked super-user status). To obtain the proper process ID number, use ps -ax. You can specify various degrees of urgency to the kill command by specifying a <signalnumber>. Signal numbers range from -1 to -9 in increasing urgency. A <signalnumber> of -9 produces the most urgent kill command.</p> <p>Options:</p> <ul style="list-style-type: none"> • -l Display a list of signal names. | <p>Syntax: <code>kill [-signal] <process ID></code></p> |

| Unix Command | Function | Syntax/Examples |
|--------------|--|--|
| ps | <p>(Process.) Displays information about the processes currently running on your terminal. Additional categories of processes can be displayed using various options.</p> <p>Process information is listed in the following columns:</p> <ul style="list-style-type: none"> • PID displays the process ID number. • TT displays the control terminal. • STAT displays the state of the process. • COMMAND indicates the command or resource that initiated the process. <p>Options for Sun (must all be combined to form the first argument):</p> <ul style="list-style-type: none"> • -a Include processes that do not have your user ID. • -g List all processes, including those otherwise classified as uninteresting. • -l Display a long listing. • -x Include processes without controlling terminal (not available on IBM®). <p>Options for IBM:</p> <ul style="list-style-type: none"> • -e Lists information about all processes except kernel processes. • -f Generates a full listing. | <p>Syntax: <code>ps [-a] [-l] [-x]</code></p> <p>Examples:</p> <ul style="list-style-type: none"> • <code>ps -ax</code> On a Sun workstation, lists all of the current processes, along with process ID numbers and other related information. • <code>ps -ef</code> On an IBM workstation, performs the equivalent of a <code>ps -ax</code> command on a Sun workstation. |

| Unix Command | Function | Syntax/Examples |
|-------------------------------------|--|------------------------------------|
| pstat (Not available on IBM) | <p>Interprets the contents of certain system tables in order to give you information about current system status.</p> <p>Options:</p> <ul style="list-style-type: none"> • -s Prints information about swap space usage. This information is broken down as follows: <ul style="list-style-type: none"> — Allocated swap space is the amount of swap space (in bytes) allocated private pages. — Reserved swap space is the number of swap space bytes not currently allocated, but claimed by memory mappings that have not yet created private pages. — Used swap space is the total amount of swap space, in bytes, that is either allocated or reserved. — Available swap space is the total swap space, in bytes, that is currently available for future reservation and allocation. • -T Prints the number of used and unused slots in the file, inode, process, and swap tables. This option is useful for checking on how full the system tables have become. | <p>Syntax: pstat [-s] [-T]</p> |

Creating, Navigating, and Managing Directories

Unix provides a variety of commands for determining your position in the directory system, listing the contents of directories, and creating new directories or removing existing directories. Some of these commands are described in the table below.

| Unix Command | Function | Syntax/Examples |
|--------------|--|--|
| cd | <p>(Change directory.) Changes the working directory. If cd is used without arguments, it returns you to your login directory.</p> <p>To specify a change of directory with an absolute pathname, start with a / (to signify the root directory) and specify the full sequence of the directories that lead from root to the destination directory.</p> <p>To specify a change of directory with a relative pathname, provide the directory sequence as it occurs from your current directory, or use .. to signify the directory immediately above the present directory.</p> | <p>Syntax:</p> <p>cd <pathname><directory></p> <p>Examples:</p> <ul style="list-style-type: none"> • cd Changes the working directory to your login directory. • cd / <directory1><directory2><directory3> Changes the working directory to <directory3> using an absolute path. • cd <directory2><directory3> Changes the working directory to <directory3> using a relative pathname. (This example assumes that the current directory is <directory1>.) • cd .. Changes the working directory to the directory immediately above the current directory. |

| Unix Command | Function | Syntax/Examples |
|--------------|--|--|
| ln | <p>(Link.) Creates a link to a file or directory. A link is a directory entry similar to the initial directory entry that was created when the file or directory was created. Any number of links can be assigned to a file. The number of links does not affect other file attributes such as size, protections, data, and so on.</p> <p>The default is to create a hard link. This is a directory entry just like the one made when the file was created. A hard link cannot be created across the network. Before you can delete a file, you must remove all hard links to it.</p> <p>An alternative is to use the -s option to create a symbolic link. This is a special directory entry that points to another named file or directory. It can span file systems. Removing the file pointed to does not affect the symbolic link.</p> <p>Options:</p> <ul style="list-style-type: none"> • -f Force files to be linked without displaying permissions, asking questions, or reporting errors. This option is only available to the superuser. • -F Force directories to be linked without displaying permissions, asking questions, or reporting errors. • -s Creates a symbolic link. | <p>Syntax:</p> <p>ln [-fs] <file name> [<linkname>]</p> <p>ln [-fs] <pathname> <directory></p> <p>Examples:</p> <ul style="list-style-type: none"> • ln -s <path1><file1> <path2><file2> Links <file1> to <file2> across the directory and redirects input from <file1> to <file2>. (The link is created as <file2>.) |

| Unix Command | Function | Syntax/Examples |
|--------------|--|--|
| ls | <p>(List.) For each file name that is a directory, lists the contents of the directory. For each file name that is a file, lists the file and any other information requested. By default, the output is sorted alphabetically.</p> <p>Options:</p> <ul style="list-style-type: none"> • -a List all entries, including those that begin with “.” • -c Use time of last edit for sorting or printing. • -d If argument is a directory, list only its name. • -l List in long format (mode, number of links, owner, size in bytes, and time of last modification). If the file is a symbolic link, the pathname of the linked-to file is printed preceded by >. • -r Reverse sort order to get reverse alphabetic or oldest first, as appropriate. • -s Give size of each file, including any indirect blocks used to map the file, in kilobytes (ls) or 512-byte blocks (/usr/5bin/ls). • -t Sort by time modified (last first) instead of name. | <p>Syntax: la [-acdirst] <directory> <file name></p> <p>Examples:</p> <ul style="list-style-type: none"> • ls -l Lists the contents of the current directory using the long form. A d in front of a file name indicates a directory. A - indicates a disk file. A b indicates a block special file. A c indicates a character special file. • ls -l -c Lists the contents of the current directory in the order of creation. • ls -a Lists the contents of the current directory, including files that are normally suppressed. |

| Unix Command | Function | Syntax/Examples |
|---------------------|---|------------------------------|
| mkdir | (Make directory.) Creates a directory. Use this command from the directory that you want to serve as parent directory to the new directory. | Syntax: mkdir <directory> |
| pwd | (Print working directory.) Displays the pathname of the current directory. | |
| rmdir | (Remove directory.) Removes the named directory. Works only on empty directories. | Syntax: rmdir <directory> |

Examining the Contents of Files

Unix provides additional commands for locating particular files within the directory system and displaying the contents of these files. These commands are useful for locating and examining the contents of particular project files, or for locating core files whose presence in a directory might be degrading system performance. Some of these commands are described below.

| Unix Command | Function | Syntax/Examples |
|--------------|--|---|
| cat | <p>(Concatenate and display.)</p> <p>Reads each <i><file name></i> in sequence and displays it. The file is displayed continuously without any page breaks.</p> <p>Options:</p> <ul style="list-style-type: none"> • -n Number the lines in the file. • -b Number the lines but omit numbers for blank lines. • -s Substitute a single blank line for multiple adjacent blank lines. • -v Display non-printing character (with the exception of TAB, NEWLINE, and FORMFEED characters) so that they are visible. | <p>Syntax:</p> <pre>cat [-nbsv] <file name></pre> |

| Unix Command | Function | Syntax/Examples |
|--------------|---|---|
| find | <p>Finds files by name or by other characteristics. <code>find</code> descends the directory hierarchy for each pathname in the specified pathname list, seeking files that match a logical expression written using the operators listed below.</p> <p>Options:</p> <ul style="list-style-type: none"> • <code>-name <file name></code> True if the <code><file name></code> argument matches the current file name. • <code>-print</code> Always true. The current pathname is displayed on the screen. <p>Note: When you use a metacharacter in a <code>find</code> command, include the metacharacter in single quotation marks.</p> | <p>Syntax:</p> $\text{find } <\text{pathname}> <\text{list}> <\text{expression}>$ <p>Examples:</p> <ul style="list-style-type: none"> • <code>find / -name <file name> -print</code> Finds file with a global search. On a large file system with a file server, this type of search can be extremely time consuming and may degrade your system response. • <code>find /p* <file name> -print</code> Finds file with local search (in this case, the <code>p</code> directories). • <code>find / -name <file name> -print</code> Finds file with search of all directories below the current directory. • <code>find / -name *cgm -print</code> Finds all files with .cgm extension. |
| more | <p>Displays the contents of a text file one screen at a time. Once a screen is displayed, you use one of the following prompts to continue the display:</p> <ul style="list-style-type: none"> • Pressing the Enter key causes one additional line to be displayed as the display scrolls up one line. • Pressing the space bar causes the next screen of text to be displayed. <p>Options:</p> <ul style="list-style-type: none"> • <code>-n</code> Number of lines in the file. • <code>-b</code> Number the lines but omit numbers for blank lines. • <code>-s</code> Substitute a single blank line for multiple adjacent blank lines. • <code>-v</code> Display non-printing character (with the exception of TAB, NEWLINE, and FORMFEED characters) so that they are visible. | <p>Syntax:</p> $\text{more } [-\text{nbsv}] <\text{file name}> \dots$ |
| page | Same as more. | <p>Syntax:</p> $\text{page } [-\text{nbsv}] <\text{file name}> \dots$ |

Copying, Moving, and Removing Files

The Unix commands for copying, moving, and removing files have many applications. The copy and move commands enable you to duplicate existing files, copy or move files from directory to directory, and copy or move files from system to system. The remove command allows you to free up disk space in your directories by removing unnecessary or obsolete files. These commands are described below.

| Unix Command | Function | Syntax/Examples |
|--------------|--|--|
| cp | <p>(Copy.) Copies files and directories within the current file system.</p> <ol style="list-style-type: none"> 1. Copies contents of <i><file name1></i> to <i><file name2></i>. The mode and owner of <i><file name2></i> are preserved if <i><file name2></i> already exists. The mode of the source file is used otherwise. 2. Recursively copies <i><directory1></i>, along with its contents and subdirectories, to <i><directory2></i>. If <i><directory2></i> does not exist, cp creates it and duplicates the files and subdirectories of <i><directory1></i> within it. If <i><directory2></i> does exist, cp makes a copy of the <i><directory1></i> directory within <i><directory2></i> (as a subdirectory), along with its files and subdirectories. 3. Copies each <i><file name></i> to the indicated directory. The base name of the copy corresponds to that of the original. The destination directory must already exist for the copy to succeed. <p>Options:</p> <ul style="list-style-type: none"> • -i (Interactive.) Prompt for a confirmation whenever the copy would overwrite an existing file. A y confirms that the copy should proceed. Any other answer prevents cp from overwriting the file. • -r, -R (Recursive.) If any of the source files are directories, copy the directory along with its files (including any subdirectories and their files); the destination must be a directory. • -p (Preserve.) Duplicate not only the contents of the original file or directory, but also the modification time and permission modes. | <p>Syntax:</p> <ol style="list-style-type: none"> 1. <code>cp <file name1> <file name2></code> 2. <code>cp -r <directory1> <directory2></code> 3. <code>cp <file name...><directory></code> |

| Unix Command | Function | Syntax/Examples |
|--------------|--|--|
| ftp | <p>(File transfer protocol.) Transfers files to and from a remote network site. ftp is the user interface of the ARPANET standard File Transfer Protocol.</p> <p>Options:</p> <p>ftp provides an extensive suite of options whose usefulness depends on your particular needs. To review these options, type <code>man ftp</code> at an xterm prompt</p> | <p>Syntax: <code>ftp [-dgintv] <host name></code></p> |
| grep | <p>grep searches the named input <i>FILEs</i> (or standard input if no files are named, or if a single dash ("") is given as the file name) for lines containing a match to the given <i>PATTERN</i>. By default, grep prints the matching lines.</p> <p>Options:</p> <ul style="list-style-type: none"> -c Instead of normal output, print a count matching lines for each input file -H Prints the filename for each match. -i Ignores case distinctions -l Suppresses normal output; instead print the name of each input file from which output would normally have been printed. The scanning stops on the first match. -V Prints the version number of grep and exit | <p>To redirect the results of a search to a file: <code>grep Student /etc/passwd > Training</code></p> <p>This searches the <i>passwd</i> file for each occurrence of the name <i>Student</i> and places the results of this search in the file <i>Training</i>.</p> |

| Unix Command | Function | Syntax/Examples |
|--------------|---|---|
| mv | <p>(Move.) Moves files and directories around in the file system. A side effect is to rename a file or directory. The three major forms of mv are shown in the synopsis below.</p> <ol style="list-style-type: none"> 1. Moves (changes the name of) <i><file name1></i> to <i><file name2></i>. If <i><file name2></i> actually exists, its contents are overwritten. 2. If <i><directory2></i> does not exist, moves (changes the name of) <i><directory1></i> to <i><directory2></i>. If <i><directory2></i> does exist, performs operation 3. 3. Moves one or more <i><file names></i> or <i><directories></i> into the last <i><directory></i> in the list. <p>Options:</p> <ul style="list-style-type: none"> • -i (Interactive.) Prompt for a confirmation whenever the copy would overwrite an existing file. A y confirms that the copy should proceed. Any other answer prevents cp from overwriting the file. • -f (Force.) Override any restrictions and the -i option. The -f option also suppresses any warning messages about modes which would potentially restrict overwriting. | <p>Syntax:</p> <ol style="list-style-type: none"> 1. mv <i><file name1><file name2></i> 2. mv <i><directory1><directory2></i> 3. mv <i><file name...><directory></i> |

| Unix Command | Function | Syntax/Examples |
|--------------|---|---|
| rcp | <p>(Remote copy.) Copies files between machines. Each file name or directory argument is either a remote file name of the form <code><host>:<path><file name></code> or a local file or directory name.</p> <p>If a <code><file name></code> is not a full pathname, it is interpreted relative to your home directory on <code><host name></code>.</p> <p>rcp does not prompt for passwords. Your current local username must exist on the remote host machine and must allow remote command execution by rsh(1C).</p> <p>If your local username does not exist on the remote host machine, you can use a third party's username.</p> <p>Options:</p> <ul style="list-style-type: none"> • <code>-p</code> Attempt to give each copy the same modification times, access times, and modes as the original file. • <code>-r</code> Copy each subtree rooted at <code><file name></code>. In this case, the destination must be a directory. | <p>Syntax:</p> <pre>rcp [-p] <file name1> <file name2> rcp [-pr] <file name>...<directory></pre> <p>Examples:</p> <ul style="list-style-type: none"> • <code>rcp <host>:<path><file name></code>. Used from the directory to which you want to copy the file. Copies the file from remote host to current working directory using the original file name. Your local username must exist on the remote host. • <code>rcp <username>@<host>:<path><file name></code>. Same as above, except that the local username does <i>not</i> exist on the remote host. Therefore, a third-party username is invoked. • <code>rcp <host>:<path><file name> <host>:<path><file name></code>. Used from any remote directory. Copies a file from one remote directory to another remote directory. • <code>rcp <file name> <path><directory></code>. Used from the directory where the file to be copied resides. Copies the file to a remote directory. |
| rm | <p>(Remove.) Removes one or more files from a directory.</p> <p>Options:</p> <ul style="list-style-type: none"> • <code>-i</code> (Interactive.) Prompt for a confirmation that each file is to be removed. A <code>y</code> confirms that the file should be removed. Any other answer prevents rm from removing the file. • <code>-f</code> (Force.) Force files to be removed without displaying permissions, asking questions, or reporting errors. • <code>-r</code> Recursively delete the contents of a directory, its subdirectories, and then the directory itself. | <p>Syntax:</p> <pre>rm [-fir] <file name>...</pre> |

| Unix Command | Function | Syntax/Examples |
|--------------|---|---|
| rsh | <p>(Remote shell.) Connects to the specified host name and executes the specified command. In most cases, the remote shell is closed when the command has been executed. If you do not specify a command, rsh logs you in on the remote host using rlogin.</p> <p>Options:</p> <ul style="list-style-type: none"> • -l <username> • Uses the remote username instead of your local username. This option enables you to execute the command using the privileges of the remote username. | <p>Syntax: rsh <host name> <command>...</p> <p>Examples:</p> <ul style="list-style-type: none"> • rsh <host name> ls <directory> Logs into host, lists contents of specified directory, then closes remote shell. • rsh <host name> cat <path><file name> Logs into host, displays contents of specified file, then closes the remote shell. |
| scp | <p>scp (Secure CoPy) is a secure and network-aware version of the UNIX rcp remote copy command and allows files to be transferred between different computers via an encrypted end-to-end link</p> <p>Options:</p> <p>-r Recursively copy entire directories</p> <p>-p Preserves modification times, access times, and modes for the original file</p> | <p>Example:</p> <p>Assuming you are already logged into a computer and you want to copy a file from your current directory to your own home directory on another computer, where you have the same username; typing <code>scp filename host:</code></p> <p>where <i>filename</i> is the file you want to copy and <i>host</i> is the name of the remote host you want to copy it to will achieve this. If your username on the remote system is different from your username on the system you are currently using, the command:</p> <p><code>scp filename username@host:</code></p> <p>where <i>username</i> is your username on the remote host will allow you to copy the file to the remote system.</p> <p>If you want to copy the file to a directory other than your home directory on the remote system, you can add a path after the ':' colon that follows the hostname, like this:</p> <p><code>scp filename username@host:/path/to/other/destinationdirectory</code></p> |

| Unix Command | Function | Syntax/Examples |
|---------------------|--|------------------------|
| telnet | <p>(TELNET.) Allows you to log into a remote host using the TELNET protocol.</p> <p>Options:</p> <p>telnet provides an extensive suite of options whose usefulness depends on your particular needs. To review these options, type <code>man telnet</code> at an xterm prompt.</p> | |

Changing the Permission Mode of a File

Permissions are assigned to both directories and files. The permission mode of a directory determines whether users can read or write to the files in the directory. The permission mode of a file determines whether users can read, write to, or execute the process specified by that particular file.

Users belong to three different categories: (1) the owner of the file, (2) the group to which the owner belongs, and (3) all others. If you are denied permission to read or write to the files in a directory, or to read, write to, or execute a particular file, chances are that you must change a permission mode. You can change the permissions assigned to a particular directory or file only if you are the owner of the directory or file, or you have superuser status.

Examining the Currently Assigned Permissions

To view the current permission mode of a file, cd to the directory within which the file resides and use the ls -lag command to display information about the files in the directory. You will receive a display that resembles the following.

| Permissions: | | | | | | |
|--------------|----------|--------|------------|-------|--------------|----------------|
| | owner | group | all others | | | |
| -rwxr--xr-- | 1 steve | daemon | | 301 | Feb 11 16:15 | ToolInfo.usr |
| -r--r--r-- | 1 steve | staff | | 2867 | Feb 12 10:39 | abc |
| -rwxr--xr-- | 1 steve | staff | | 37 | Feb 13 10:47 | dir.dat |
| drwxrwxrwx | 11 steve | daemon | | 1024 | Apr 13 16:45 | docs |
| -r--r--r-- | 1 steve | staff | | 531 | Apr 22 14:42 | fmconsole.log |
| -rwxr--xr-- | 1 steve | staff | | 65792 | Mar 6 10:53 | hzrcoltold |
| -rwxr--xr-- | 1 steve | daemon | | 6278 | Feb 11 16:15 | launcher.dat |
| -rwxr--xr-- | 1 steve | staff | | 4410 | Feb 12 16:55 | owprofile.seis |
| drwxr--xr-- | 2 steve | staff | | 512 | Apr 13 10:08 | run |
| drwxrwxrwx | 5 steve | daemon | | 1536 | Feb 20 03:15 | steve2 |

Unix Shell

Diagram illustrating the columns of the ls -lag output:

- (column 1): The first column indicates the file type (d for directory, - for file).
- name of owner: The second column shows the user owner of the file.
- name of group: The third column shows the group owner of the file.

Column 1 indicates whether the file is a directory, a file, or a link. A dash (-) indicates that the file is a file. A “d” indicates that the file is a directory. An “l” indicates a link to a file or directory.

Columns 2 through 4 indicate the permissions for the user. Columns 5 through 7 indicate the permissions for the group to which the user belongs. And Columns 8 through 10 indicate the permissions for all other users.

To determine what permissions are currently assigned to the different user types, use the following table.

| Permission Code | Description |
|-----------------|--|
| r | Allows prospective user to read the file. |
| w | Allows prospective user to write to or modify the file. |
| x | Allows the prospective user to execute the file. This option only applies to files that are executables. |
| - | Denies access of the particular type indicated by the respective column. That is, if a dash (-) displays in a read column, the read permission is denied. If it displays in a write column, the write permission is denied. If it displays in an execute column, the execute permission is denied. |

Customizing Permissions for Different User Types

You can change the permissions assigned to particular user types with the following chmod command.

`chmod <user type><operator><permission code><filename>...`

The variables that can be used in this command are described in the table below.

| Variable | Description |
|--------------------------------|--|
| <code><user type></code> | Specifies which of the user types is to be affected by the permission change. Valid codes for user types: <ul style="list-style-type: none">• u is the owner.• g is the group.• o is all others |
| <code><operator></code> | Specifies whether permissions are to be granted or denied. Valid options: <ul style="list-style-type: none">• + indicates that the permissions are to be granted.• - indicates that the permissions are to be denied. |

| Variable | Description |
|-------------------|--|
| <permission code> | <p>Specifies the type of permission to be granted or denied. Valid codes:</p> <ul style="list-style-type: none"> • r applies to read privileges. • w applies to write privileges. • x applies to execute privileges. |
| <file name> | <p>Names the directory or file(s) to which the permissions are to be applied. If <file name> is the name of a directory, the chmod operation determines which users can read or write to the files in the directory. If <file name> is the name of a file, the chmod operation determines which users can read, write to, or execute the file.</p> |

Granting Read, Write, and Execute Permissions to All User Types

If you are the owner of a directory or file, you can grant read, write, and execute permissions to all user types by using the following command

```
chmod 777 <filename>...
```

This method uses the octal number 777 to assign permissions. The octal number method of assigning permissions is described in the online “man pages” for chmod (which you can view by typing man chmod at a system prompt). This method of assigning permissions is not described in this chapter.

To change the permissions within a particular directory and apply the changes to all subdirectories and their files, you can use the following “recursive” chmod command.

```
chmod -R 777 <filename>...
```

Archiving and Retrieving Files

You can use the tar command to archive and retrieve files. The files are archived collectively in a “tarfile.” Once a tarfile is created, additional files can be appended to its contents. Files can be retrieved from the tarfile either individually by name or collectively by directory.

The tar command is particularly useful for moving data from one Unix environment to another (for example, from the Landmark® Unix environment to some other Unix environment).

The files can be archived on a disk drive, a tape drive, or a floppy drive, whichever is most appropriate. If archived to a tape drive or a floppy drive, the name provided for the tarfile is the absolute pathname of the tape drive or floppy drive.

The tar command has the following structure:

```
tar  
<functiontype><functionmodifier><tarfile><block  
size> <exclude-file> -I<include-file>  
<filename>...
```

The variables that can be used in this command are described in the table below.

| Variable | Description |
|------------------------------|--|
| tar | Creates a single archive file, called a tarfile, or appends files to an existing tarfile, or retrieves files from a tarfile. Which tar operation is performed depends on <i><function type></i> . |
| <i><function type></i> | <p>Specifies type of tar operation to be performed. Only one function type can be specified per tar operation.</p> <p>Options:</p> <ul style="list-style-type: none"> • -c Create a new tarfile and write the named files to it. • -r Append the named files to the tarfile. (This option does not work with quarter-inch tape drives.) • -t List the table of contents of the tarfile. • -u Add the named files to the tarfile if they are not already there or if they have been modified since they were last archived. (This option does not work with quarter-inch tape drives.) • -x Extract the named files from the tarfile. If a named file matches the name of an archived directory, this directory is retrieved with its contents. The owner, modification time, and mode are restored. If no file names are given in the tar command, all files in the tarfile are retrieved. If multiple versions of the same file exist in the tarfile, only the last one is retrieved. |

| Variable | Description |
|------------------------------|---|
| < <i>function modifier</i> > | <p>Specifies particular variations of tar operation. Multiple modifiers can be specified.</p> <p>Options:</p> <ul style="list-style-type: none"> • b Use the next argument as the blocking factor for tape records. The default blocking factor is 20 blocks. • B Force tar to perform multiple reads so as to read exactly enough bytes to fill a block. • e If any unexpected errors occur, exit immediately with a positive exit status. • f Use the next argument as the name of the tarfile. If f is omitted, use the device indicated by the TAPE environment variable, if set. Otherwise, use /dev/rmt8 by default. If <<i>tarfile</i>> is given as “-”, tar writes to standard output or reads from standard output—whichever is appropriate. • F Exclude the files from the tarfile as follows: If one F is specified, exclude all directories named SCCS. If two Fs are specified, exclude all directories named SCCS, all files with .o as their suffix, and all files named errs, core, and a.out. • h Follow symbolic links as if they were normal files or directories. • i Ignore directory checksum errors. • l Display error messages if all links to archived files cannot be resolved. If l is not used, no error messages of this type are printed. • p Restore the named files to their original modes. • v Display the name of each file and the function being performed on it as the tar operation is performed. • w Wait for user confirmation before taking the specified action. To confirm the action to be performed, the user must type y. • X Use the next argument as a file containing a list of the named files or directories to be excluded from the tarfile when using the <<i>function type</i>> options c, x, or t. Multiple X arguments may be used, with one <<i>exclude_file</i>> per argument. • 0, 1, 4, 5, 7, 8 Select an alternative drive on which the tape is mounted. The numbers 2, 3, 6, and 9 do not specify valid drives. For most Landmark workstations with tape drives, a 1/4" tape drive is /dev/rst0, an 8mm tape drive is /dev/rst1, and a 9-track tape is /dev/rst. IBM workstations automatically assign numbers to the drives in accordance with the Unix remote magnetic tape (rmt) protocol. The first tape drive is numbered rmt0. For more information on the remote magnetic tape protocol, type <code>man rmt</code> at an xterm prompt. |
| < <i>tarfile</i> > | <p>Name of tarfile to be created. If the files are to be archived to a disk file, this name is the pathname and an appropriate file name. If the files are to be archived to a tape drive, this name must be the name of the tape drive. The <<i>tarfile</i>> argument is only necessary if the function modifier f has been specified. See the discussion of the f option above.</p> |

| Variable | Description |
|----------------|--|
| <block size> | Blocking factor for tape records. This argument is only necessary if the function modifier b has been specified. |
| <exclude-file> | File containing a list of named files (or directories) to be excluded from the tarfile when using the <function type> options c, x, or t. This argument is only necessary if the function modifier X has been specified. |
| -I | Function modifier that opens <include-file>. |
| <include-file> | A file that contains a list of files, one per line, that is read as if the file names displayed on the command line. Using this file eliminates the need to key a string of file names into the tar command. This argument is only necessary if the -I function modifier has been specified. |
| <file name> | Name of the file to be archived in, appended to, or retrieved from the tarfile. Multiple file names can be specified. |

Archiving the Contents of a Directory to a Tape Drive

You can archive the contents of a directory to a tape drive using the following procedure.

1. Load the tape into the tape drive.
2. Use the cd command to change directories to the directory that you want to archive.
3. Determine the name of the tape drive to which you are archiving the data.
4. Key in the following command:

```
tar -cvf /dev/rst? .
```

where ? is the number of the appropriate tape drive.

The tar operation will create a tarfile on the tape and copy the contents of the current directory to that tarfile. The name of each file will be displayed as the file is archived.

Restoring the Contents of a Tarfile from Tape to Disk

You can restore the contents of a tarfile from tape to disk using the following procedure.

1. Load the tape into the tape drive.
2. Use the cd command to change directories to the directory where you want the contents of the tarfile to be restored.
3. Key in the following command

```
tar -xvf /dev/rst?.
```

where ? is the number of the appropriate tape drive.

The tar operation will restore the contents of the tarfile to the current directory. If the files in the tarfile already exist in the current directory, they will be overwritten. If they do not already exist, they will be created.

Printing Files

You can use various print commands to print the contents of files to line printers. Some of these commands are provided below.

| Unix Command | Function | Syntax/Examples |
|--------------|---|--|
| cancel | Cancels a printing request that has been sent to the line printer. The command line arguments may be either job IDs or printer names. When IDs are specified, cancel removes the jobs corresponding to the IDs from the printer queue. Specifying a printer cancels the request that is currently printing on the printer. | Syntax: cancel [<IDs> [<printers>] |
| lp | (Line printer.) Sends a printing request to the line printer. The order in which file names display is the order in which they are printed. The print request is sent to a default printer if no alternate printer is specified. lp associates a unique ID with each request and prints it on the standard output. This ID can be used to cancel or find the status of the print job. Options: <ul style="list-style-type: none">• -w Write a message on the user's terminal after <file name> has been printed. If user is not logged in locally, send mail instead.• -d<dest> Choose <dest> as the printer that is to do the printing. By default, <dest> is taken from the environment variable LPDEST, if it is set. Otherwise, <dest> is taken from the environment variable PRINTER. If PRINTER is not defined, the print job is sent to the default printer.• -n<number> Print <number> of copies. The default is 1.• -t<title> Print <title> on the banner page of the output. | Syntax: lp [-wd] [-d<dest>] [-n<numb>] [-t<title>] <file name>... |

| Unix Command | Function | Syntax/Examples |
|--------------|--|--|
| lpc | <p>(Line printer control.) Controls operation of one or more printers. Can be used to start/stop a printer, disable/enable a printer spool, rearrange the order of jobs in a queue, or display the status of each printer with its spooling queue and printer queue. If there are no arguments, lpc runs interactively, prompting with lpc>. If arguments are used, lpc interprets the first as a command and subsequent arguments as parameters for the initial command.</p> <p>Options:</p> <ul style="list-style-type: none"> • abort [all [<printer>...]] Immediately terminate active spooling daemon on the local host and disable printing (prevent new daemons from being started by lpr(1) for the specified printers). (Super-user only) • disable [all [<printer>...]] Turn off the specified printer queues, preventing new jobs from being entered into the queue by lpr(1). (Super-user only) • down [all [<printer>...]] Turn off the specified printer queues, disable printer, and write message to printer status file. Normally used to take a printer down and let others know why. (Super-user only) • enable [all [<printer>...]] Enable spooling on the local queue for listed printers so that lpr(1) can put new jobs in the queue. (Super-user only) • exit or quit Exits from lpc. • restart [all [<printer>...]] Start a new printer daemon for print jobs left in the queue by a failure of the previous daemon. • start [all [<printer>...]] Enable spooling and start a printer daemon for the listed printers. (Super-user only) • status [all [<printer>...]] Display the status of daemons and queues on the local machine. This command can be run by any user. • stop [all [<printer>...]] Stop a spooling daemon after the current job completes and disable printing. (Super-user only) • topq <printer>[job#...] [user...] Move the print jobs specified by <i>job#</i> or those jobs belonging to <i>user</i> to the top of the printer queue. (Super-user only) • up [all [<printer>...]] Enable everything and start a new printer daemon. up undoes the effects of down. | lpc [<i>command</i> [<i>parameter...</i>]]) |

| Unix Command | Function | Syntax/Examples |
|--------------|---|--|
| lpq | <p>Displays the contents of a printer queue. When invoked without options, lpq reports on all the jobs in the default printer queue. For each print job in the queue, lpq reports the user's name, user's current position, names of files that comprise the job, job ID, and total size in bytes.</p> <p>Options:</p> <ul style="list-style-type: none"> • -P<printer> Provide information about the queue for <printer>. • -l Provide information in the long format, including the name of the host from which the print request originated. • + <interval> Display queue information periodically until the queue is empty. The variable <interval> is specified as no. of seconds. | <p>Example:</p> <ul style="list-style-type: none"> • lpq -P hp4 Provides queue entries for printer hp4. |
| lpr | <p>Creates a spooled printer job for subsequent printing as available. Each print job consists of a control file and one or more data files.</p> <p>Options</p> <ul style="list-style-type: none"> • -P<printer> Send output to <printer>. • -#<number> Produce <number> of copies. • -T<title> Use <title> instead of file name as the title of the printout. | <p>Syntax:</p> <pre>lpr [-P<printer>] [-#<number>] [-T<title>] <file name>...</pre> |
| lprm | <p>Removes a job or jobs from a printer's spooling queue. Since the spool directory is protected from users, using lprm is normally the only method by which a user can remove a job. When used without arguments, lprm deletes the job that is currently active, provided that the user who invokes lprm is the same user that requested the print job. You can remove a specific job by supplying its job number as an argument. To obtain the job number, use lpq to query the queue.</p> <p>Options:</p> <ul style="list-style-type: none"> • -P<printer> Specify a particular printer to which the lprm job applies. Otherwise, the job is applied to the default printer. • - Remove all jobs requested by you. • <IDnumber> Remove the job with ID number specified by <IDnumber>. | <p>Syntax:</p> <pre>lprm [-P<printer>] [-] [<IDnumber>...]</pre> |

| Unix Command | Function | Syntax/Examples |
|---------------------|--|--|
| lpstat | <p>(Line printer status.) Displays information about the line printer spooling system. If no options are given, lpstat prints the status of all requests made to the line printer by the user.</p> <p>Options:</p> <ul style="list-style-type: none"> • -d Print the system default destination for output requests. • -r Print the status of the printer request scheduler. | lprm [-P<printer>] [-] [<IDnumber>...] |
| lpstat | <p>(Line printer status.) Displays information about the line printer spooling system. If no options are given, lpstat prints the status of all requests made to the line printer by the user.</p> <p>Options:</p> <ul style="list-style-type: none"> • -d Print the system default destination for output requests. • -r Print the status of the printer request scheduler. | |

Using a Text Editor to Create and Edit Files

Nedit is a text editor that is bundled as a user tool on all Landmark workstations as a component of the Unix operating system. You can use nedit to create new ASCII text files and to edit existing ASCII files. For example, you can use vi to create well data files. You can then import these files to the Seis/3D project using the appropriate import option. You can use vi to edit ASCII files that you have exported for this purpose. You can also use it to edit system administration files if necessary-for example, to edit your .Xdefaults file or one of your .profile files.

To execute it, open a xterm window and type:

```
nedit
```

