Agricultural and Forest Reappraisal

for the

Montana Department of Revenue
Property Assessment Division

Property Assessment Division

2009 Reappraisal of Agricultural and Forest Land for the State of Montana

Background

- Definition of agricultural property
- Value of agricultural property
- How individual parcels are valued

2009 reappraisal

- Why change the process?
- How the change was implemented

Problems and solutions

- Sources of GIS and productivity data
- Missing and misaligned data
- Quality control of the valuation process

Montana Defines Agricultural Land as Follows:

- Parcels of land 160 acres or more that are under one ownership
- Parcels used primarily for raising and marketing agricultural products
  - -$1,500 in annual gross income is produced and marketed from the land by the owner, owner's immediate family, agent, employee or lessee
- Being free of stated restrictions prohibiting its use for agricultural purposes

Montana Values Agricultural Land For Taxation …

- Based on the productive capability of the land
- Exclusive of values attributed to urban influences or speculative purposes
- Classified into five land use types
    1. Grazing land
    2. Non-irrigated summer fallow farm land
    3. Tillable irrigated farm land
    4. Non-irrigated continuously cropped hay land
    5. Non-irrigated continuously cropped farm land

Montana Values Agricultural Land for Taxation

$$V = I/R$$

V = productivity value of each type of agricultural land

I = net income of each type of agricultural land

R = capitalization rate

Prior to the 2009 Reappraisal

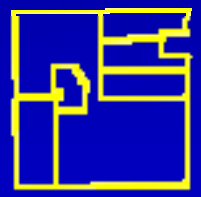
- Productivity and land use was determined by Department appraisers
  - -Time consuming
  - -Non-scientific
  - -Non-consistent
  - -Subjective
- Productivity data was over generalized by classes
- Appraisal did not result in a fair and equitable approach for determining agricultural land productivity

Advisory Committee Recommendations

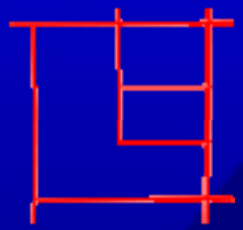
- Use a Geographic Information System to delineate various agricultural uses
- Obtain existing land use data and create new boundaries where necessary
- Eliminate current grading system and determine productivity based on NRCS soil survey information
- Where productivity information is missing, develop a routine for determining productivity based on surrounding soils
- Continue using five agricultural use classifications: grazing, wild hay, fallow, continuously cropped and irrigated

many more specific recommendations
for calculating productivity…

GIS Implementation



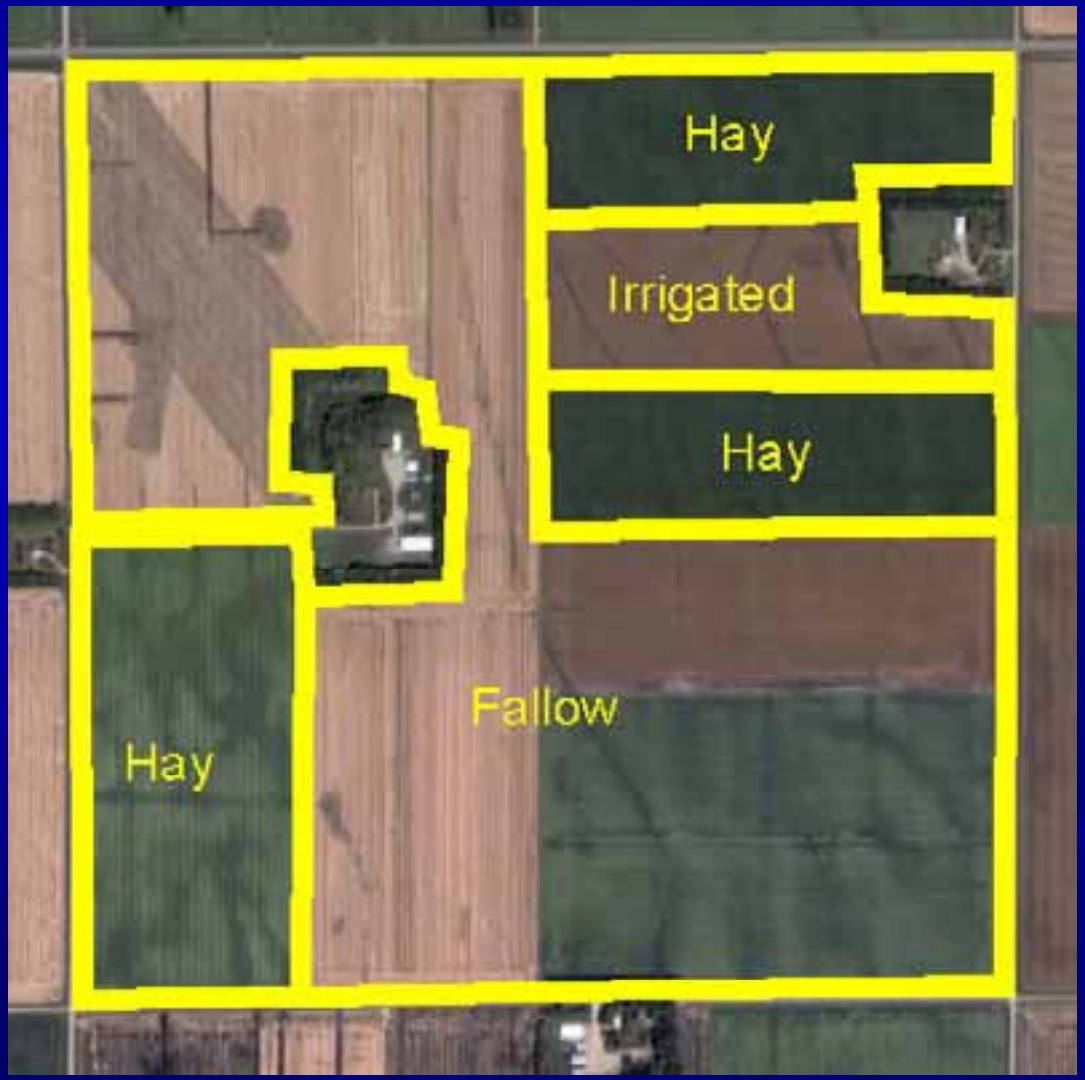
Land Use



Cadastral

Soil

Land Use



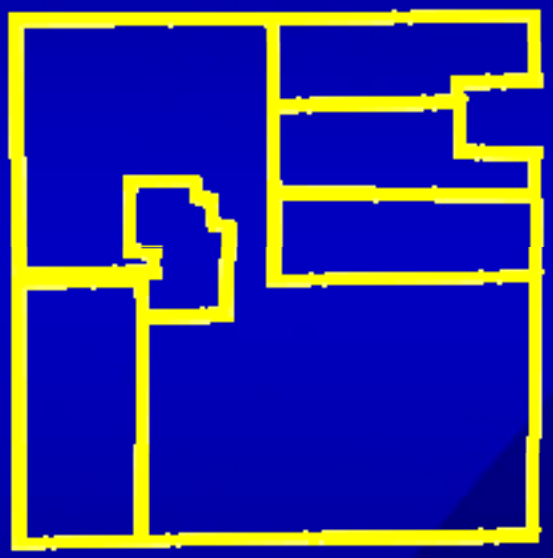
Cadastral

Soil

Three Geographic Components Used for Valuation

Three Geographic Components Used for Valuation

Land Use

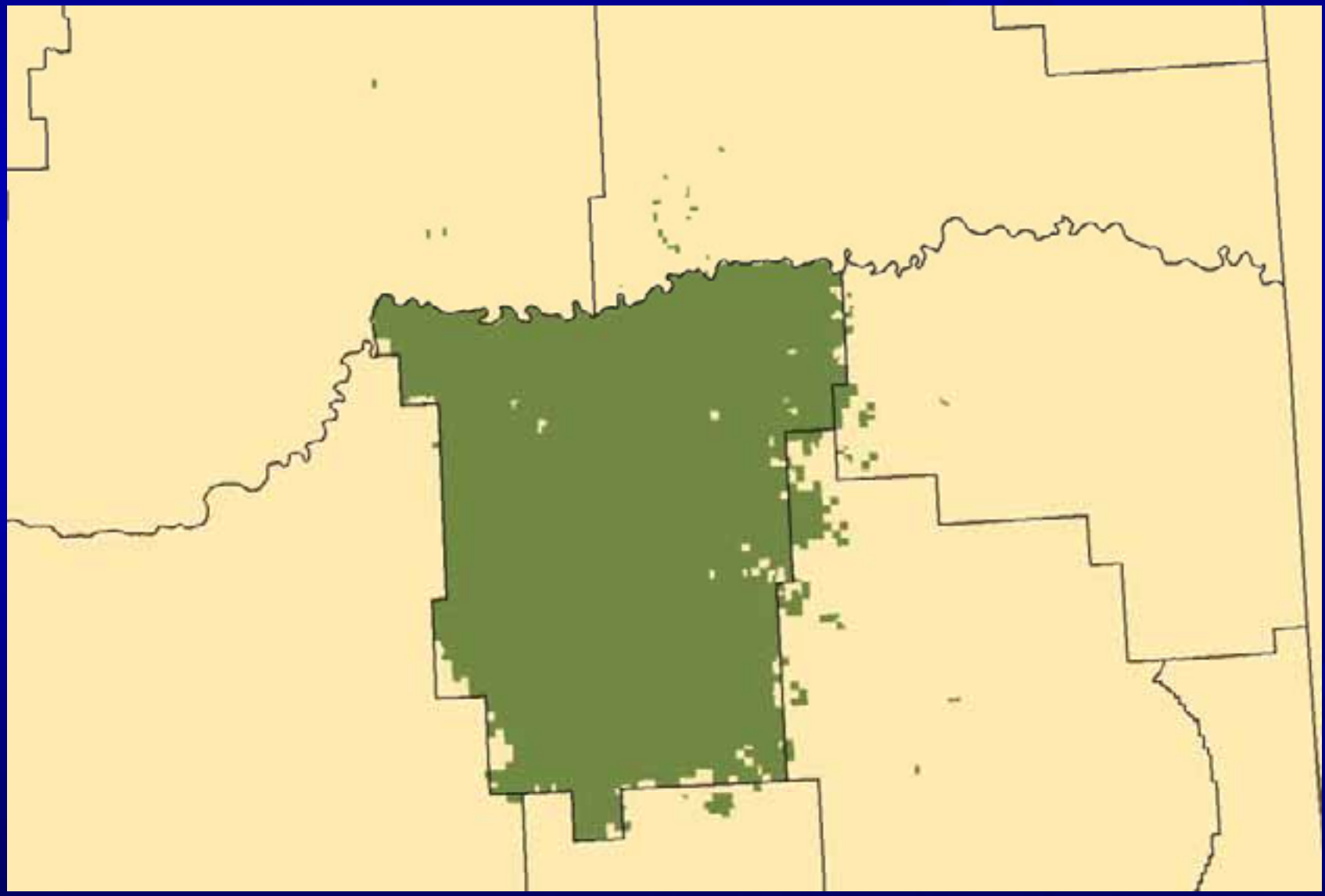


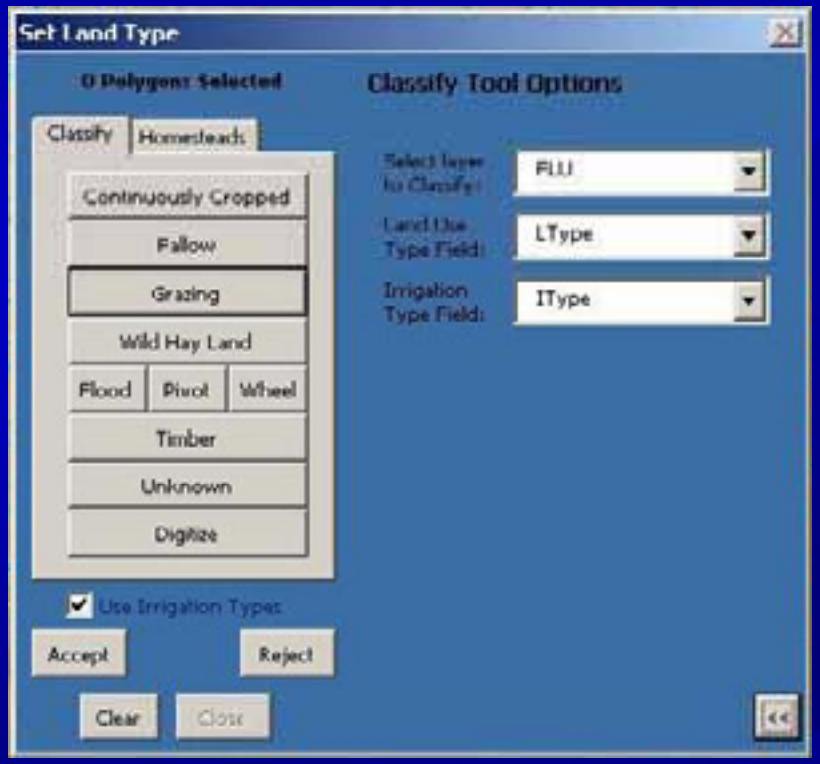
- Obtain statewide aerial imagery
- Obtain field boundaries
- Expand two agricultural classifications to five
- Make delineation detail more uniform
- Organize data by county
- Fix overlaps and gaps
- Validate
  - -Quality control
  - -Topology
  - -Staff field checks
  - -Taxpayer feedback

Detailed Line Work

Some Areas Have Less Detail

Data Not Grouped Precisely Along County Lines



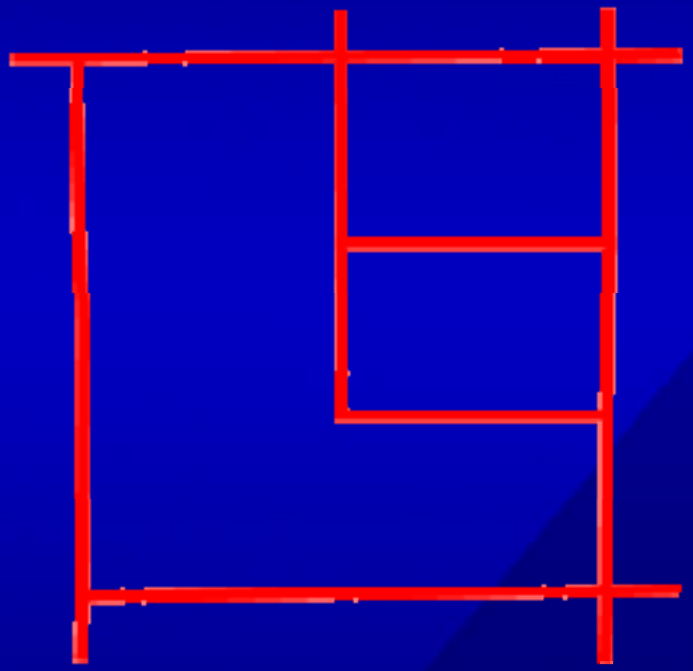


Custom VBA tool for editing and classifying land types in ArcGIS

DTM Consulting, Inc.

Bozeman, MT

Cadastral



- Obtain current cadastral data
  - -County
  - -City
  - -Department of Revenue cartographer
- Maintain cadastral
  - -Topology
  - -Splits and joins
  - -GCDB adjustments
  - -Validate with electronic tax records
  - -Identify slivers
  - -Create adjusted cadastral where necessary

Smith has 1.19 acres from a neighboring parcel's land use because of a parcel misalignment.

The 1.19 acre sliver is excluded from the productivity calculations. The remaining land use (grazing) is rebalanced to match the deeded acres.

Custom VBA tool for identifying slivers in ArcGIS

DTM Consulting, Inc.

Bozeman, MT

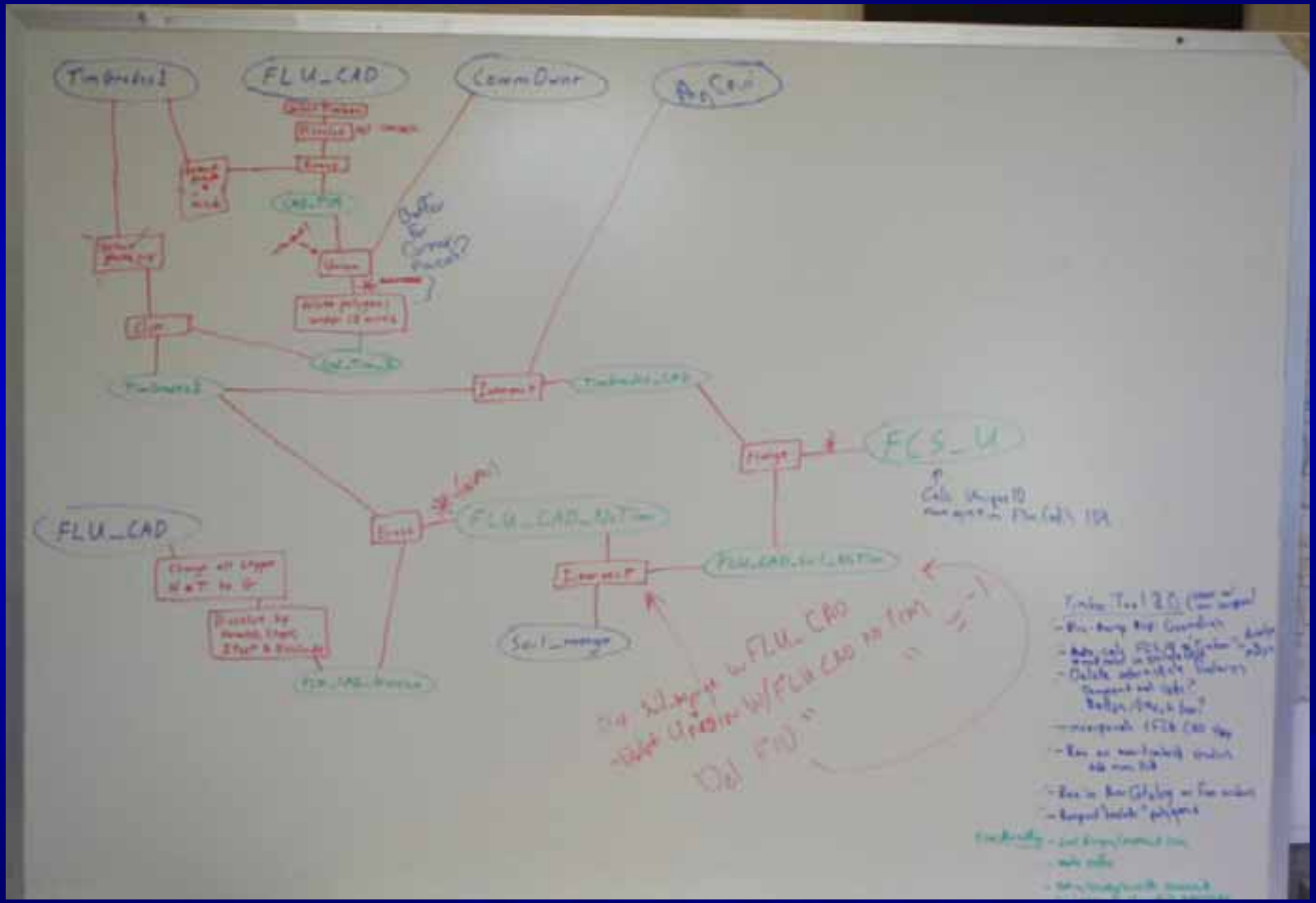
Some cadastral data was misaligned

Corrected with a temporary adjusted cadastral

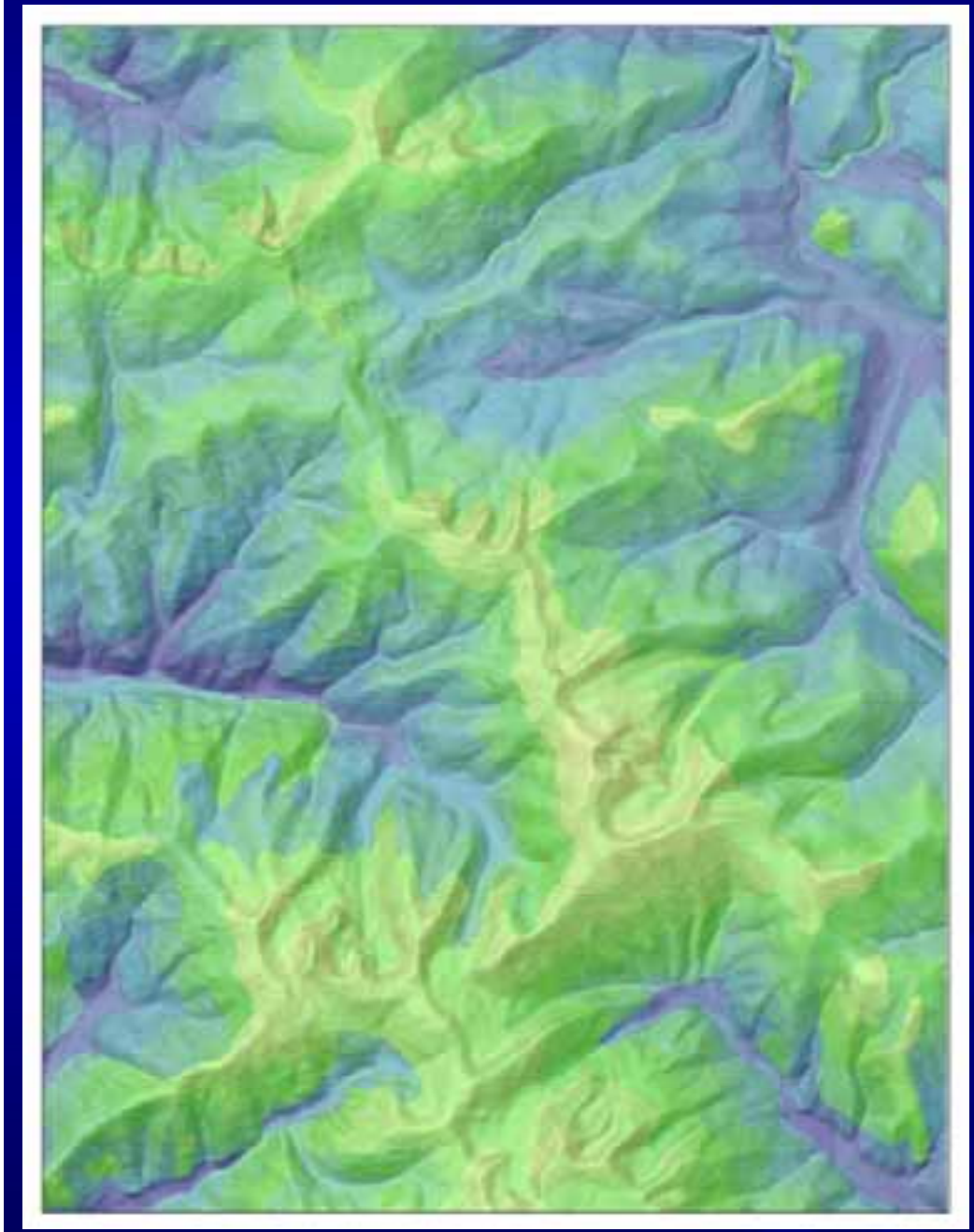
Qualified Timber Land …

- Is populated with commercial species of trees
- Must be capable of producing at least 100 board feet per acre according to the University of Montana timber model

- Must be at least 15 acres of contiguous forest with the same ownership
  - The Montana Department of Revenue has a complex set of rules for determining contiguity
    - Corner contiguous
    - Contiguous across right-of-way
    - Contiguous across river or stream



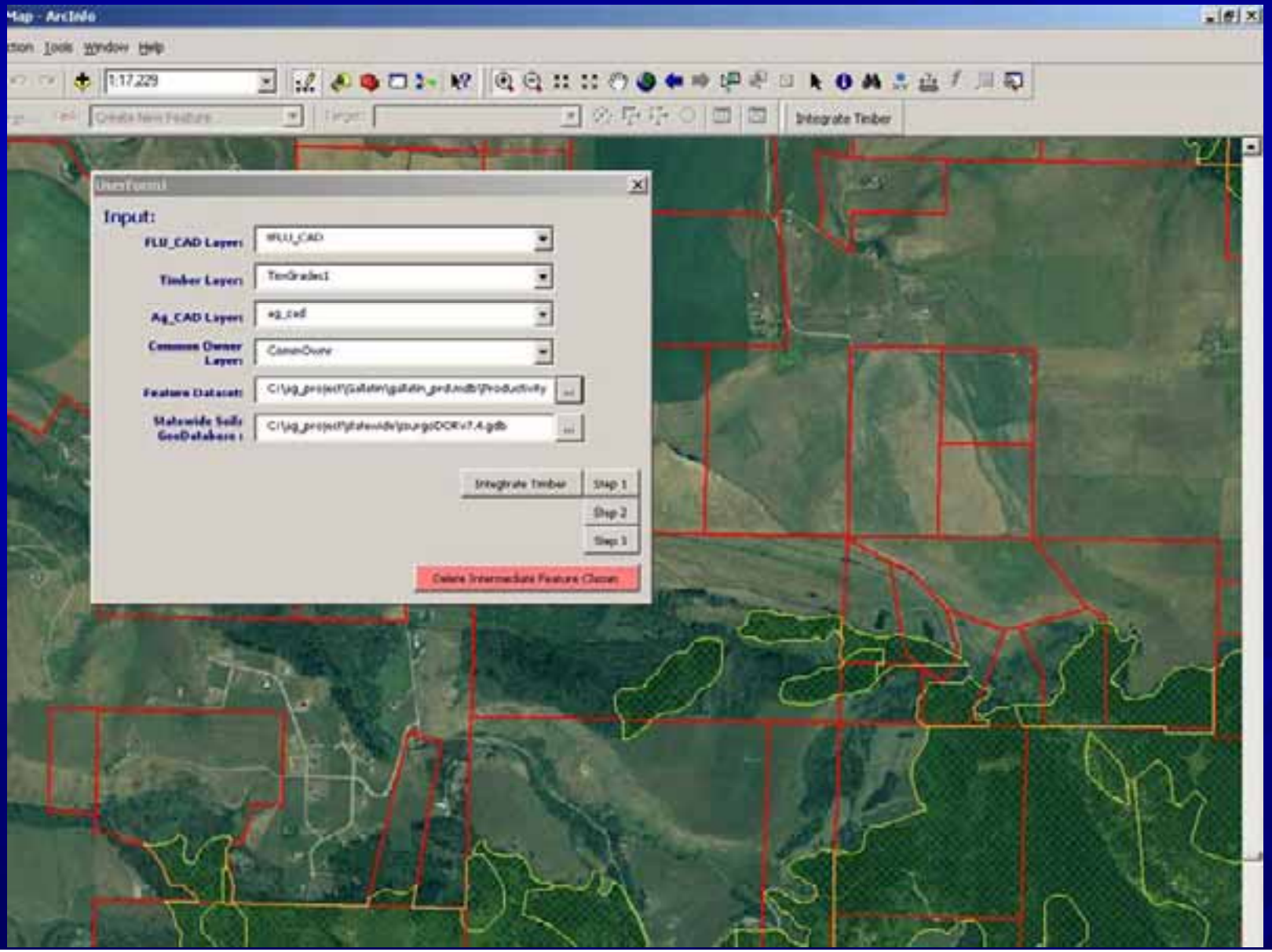
Montana’s straightforward timber assessment process



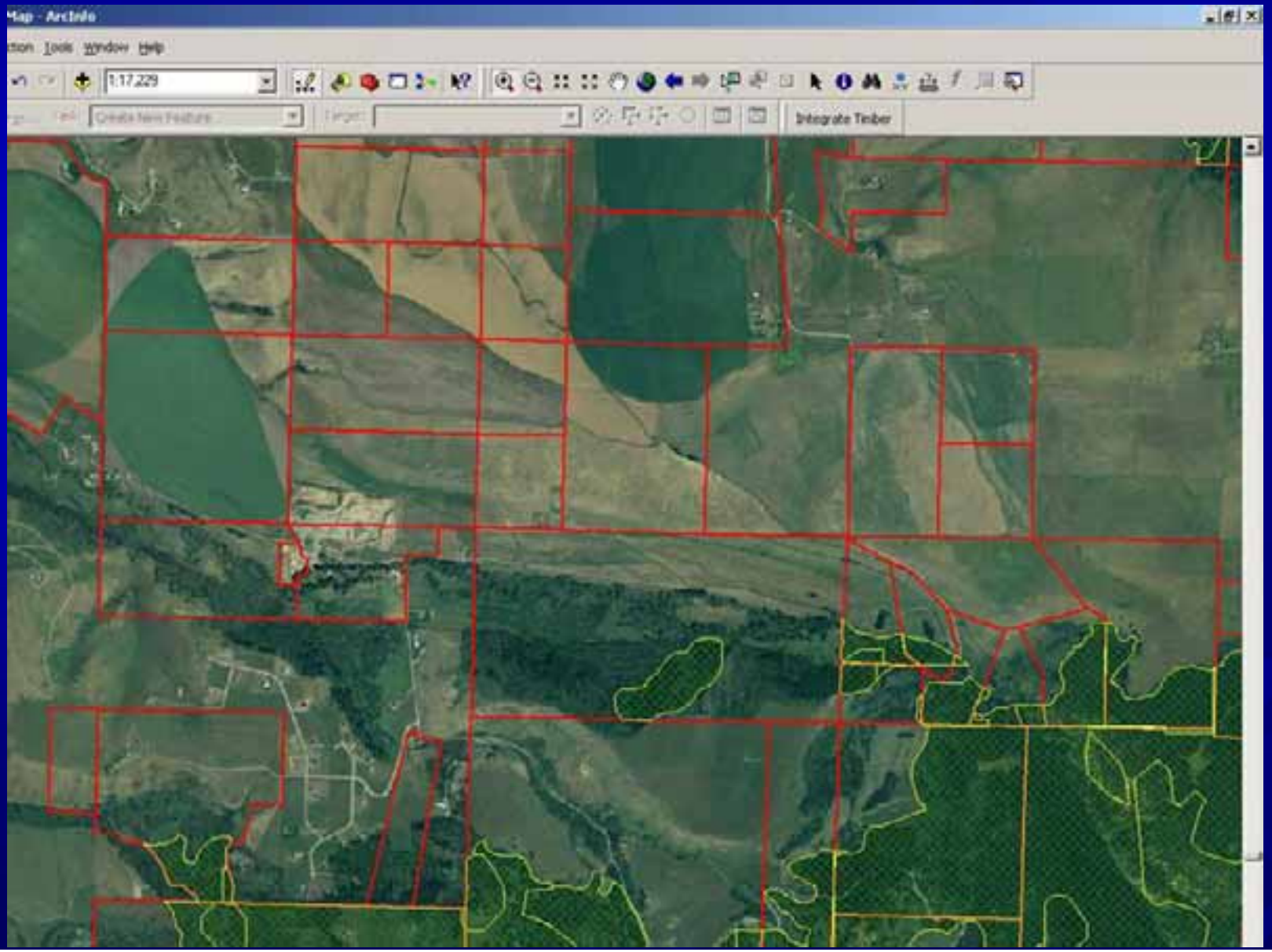
University of Montana Timber Productivity Data

- College of Forestry and Conservation
- Four million acres of forest land
- Raster data
- Based on:
  - Soil data
  - Precipitation
  - Elevation/slope/aspect
  - Climate

VBA TimberTron tool



VBA TimberTron tool



Soil

- Obtain current SSURGO data from NRCS
- Obtain current NASIS data from NRCS
- Obtain timber model from University of Montana
- Check topology
- Calculate missing productivity
- Adjust productivity data
  - Montana ag statistics
  - Taxpayer feedback

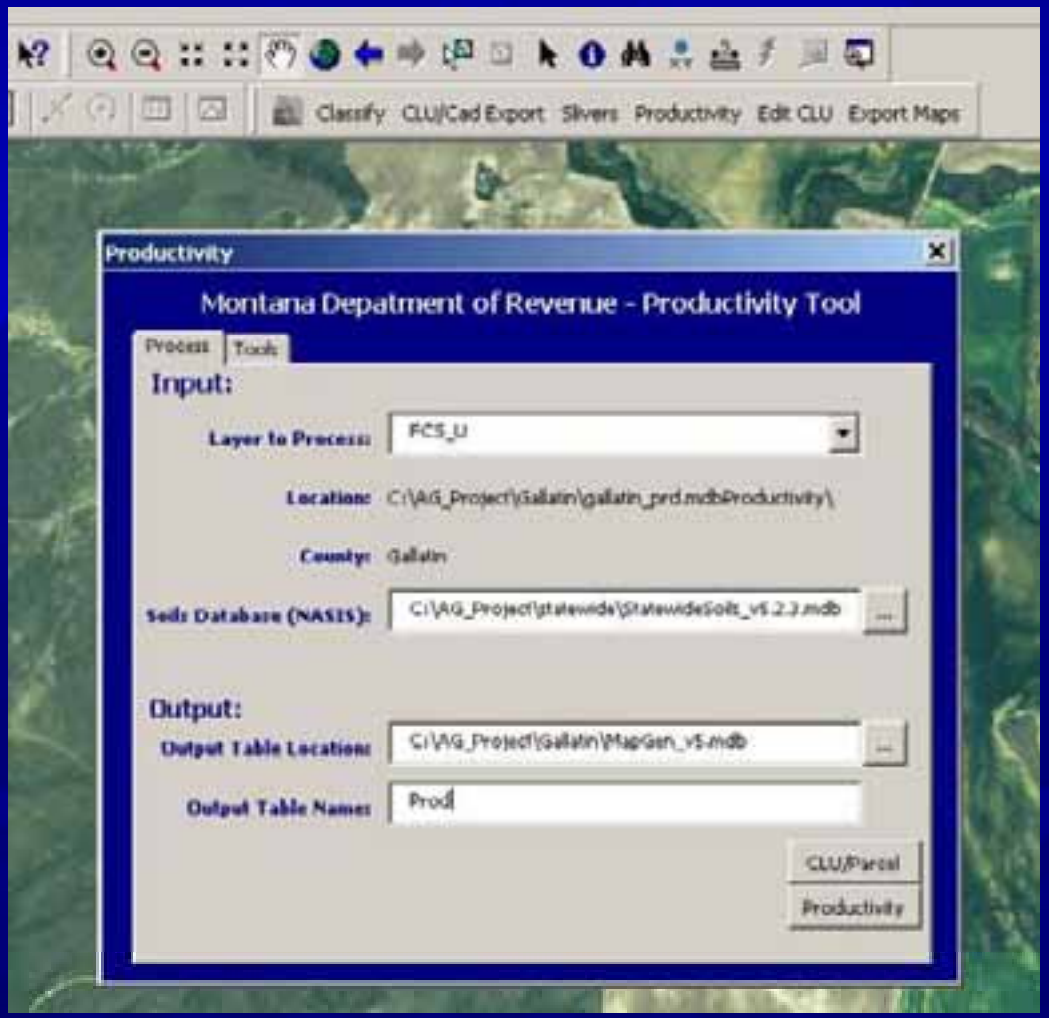
Several soils have no irrigated yield data

Putting everything together

- Timeline
- Personnel
- Hardware
- Software
- Legislature
- Public relations
- Processing
- Map mailing
- Feedback
- Assessment

VBA Productivity Tool

- Processes the combined layer of Land Use, Cadastral and Soil
- Obtains productivity from:
  - NASIS tables
  - Irrigation override table
  - Buffer routine
    - One mile
    - Five miles
    - Twenty miles



DTM Consulting, Inc., Bozeman, MT

Post Productivity Processing (MS Access)

- Adjust GIS acres to match deeded acres
- Check for missing values
- Subtract farmsite acres
- Adjust fallow productivity according to county wide average
- Adjust irrigated productivity according to local adjustments
- Calculate average productivity by land use for Land Classification maps
- Combine like productivity values for upload table

Jones has a 1 acre farmsite on this parcel.

The location of the farmsite is identified and 1 acre is subtracted from the underlying land use.

Montana Department of Revenue

Dan Bucks
Director

Brian Schweitzer
Governor

Thursday, January 15, 2009

Doe John
580 18th Street
Marilyn, MT 59629-9148

Dear Landowner:

Your attention to this letter will help ensure the accurate tax assessment of your land.

Once every six years, the Montana Department of Revenue is required by state law to conduct a reappraisal of all lands in the state. We are asking for your assistance as we complete the reappraisal of all agricultural and forest land by the end of 2008. Please take this opportunity to help us make an accurate appraisal of your property.

We have enclosed photomaps that represent our understanding of your current land use (classification) and the estimated productivity (yield) of your agricultural and/or forest land based on average management practices. We will use this information as we determine the new appraisal values for your property taxes that will be effective on January 1, 2009. Please review these photomaps for accuracy.

If you own the land but someone else farms or ranches for you, you may wish to forward the maps and information to the operator.

Agricultural Land

The 2005 and 2007 Montana Legislatures provided funding that enabled us to review agricultural land more comprehensively than in any other reappraisal since the 1960s.

We base our determination of agricultural land on classification and estimated productivity using field boundary lines provided by the Farm Service Agency, aerial photography, on-site reviews, interviews with landowners, as well as input from an Agricultural Land Valuation Advisory Committee (comprised of producers from around the state and others knowledgeable about farm and ranch practices).

If your land is irrigated, we have also enclosed a questionnaire regarding your irrigation related energy costs. State law allows you to receive an energy cost deduction that could result in a lower assessed value. Please return the questionnaire to us within 30 days.

Forest Land

We base our determination of commercial forest land on classification and estimated productivity using statutory minimum requirements, aerial photographs and on-site reviews.

Letter with detailed instructions for annotating and returning maps

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X

44,500

Montana Department of Revenue - 2009 Reappraisal Classification - Monroe County

Owner: Doe John
Parcel ID: 5634870201010000
Twnshp/Rng/Sec: T24 N R54 W 503

Total Fallow Acres: (F):	217.615
Total Grazing Acres: (G):	69.069
Total Irrigated Acres: (I):	65.086
Homestead Size:	1.000
Total Parcel Acreage:	352.770

Land Classification Map

Land Classification Map

X

294,000

10% of the maps sent were returned by the landowner with changes

Upload file


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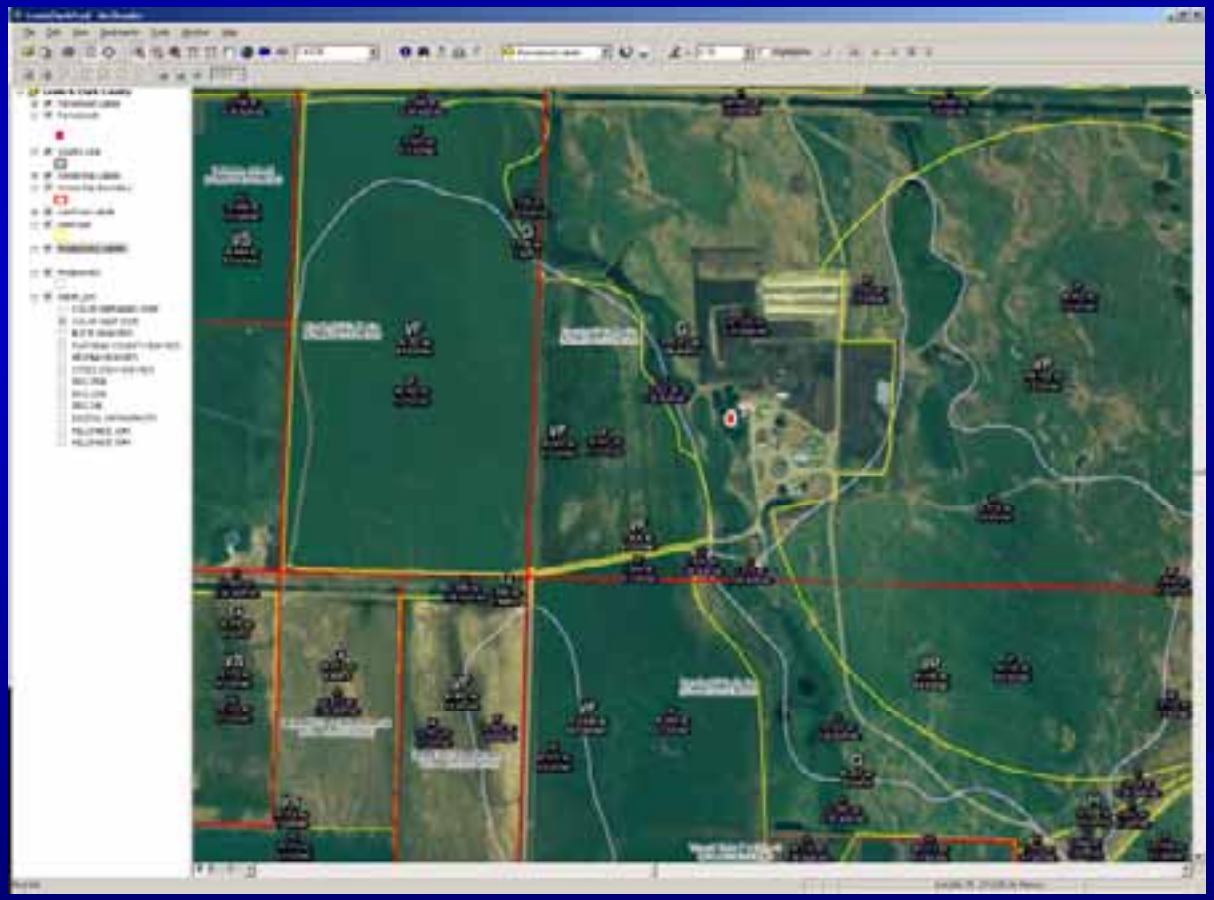
ArcReader



County office staff were trained and supplied with periodic updates as the project progressed

Project Overview

- 294,000 parcels valued
- 50 million acres of private land
- 3½ year project of heavy processing
- 6 GIS Techs/Analysts
- 1 GIS Manager
- 1 Application Developer (DMT Consulting)
- 14 pages of processing instructions

- Maintainable GIS layer of land use covering the entire state of Montana

Turning back time (with unlimited funds)

- Build and maintain layers in a multi-user geodatabase environment
- Distribute finished maps via web application instead of ArcReader files
- Establish reasonable minimum productivity values through the legislature, advisory council or departmental procedures
- Create consolidated tables for productivity yields to speed up processing time
- Populate areas with missing SURGO data with estimated values
- Persistent timber identifiers to maintain timber where it is legally contiguous but not geographically contiguous

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Questions?

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