

Two Local Government Case Studies

**Dean R. Anderson
(IT Director)
Responsible for
Geographic Information Systems (GIS)
at Polk County, Oregon**

Presentation

1. Provide Context

- **Who Polk County is**

2. Present Case Studies....

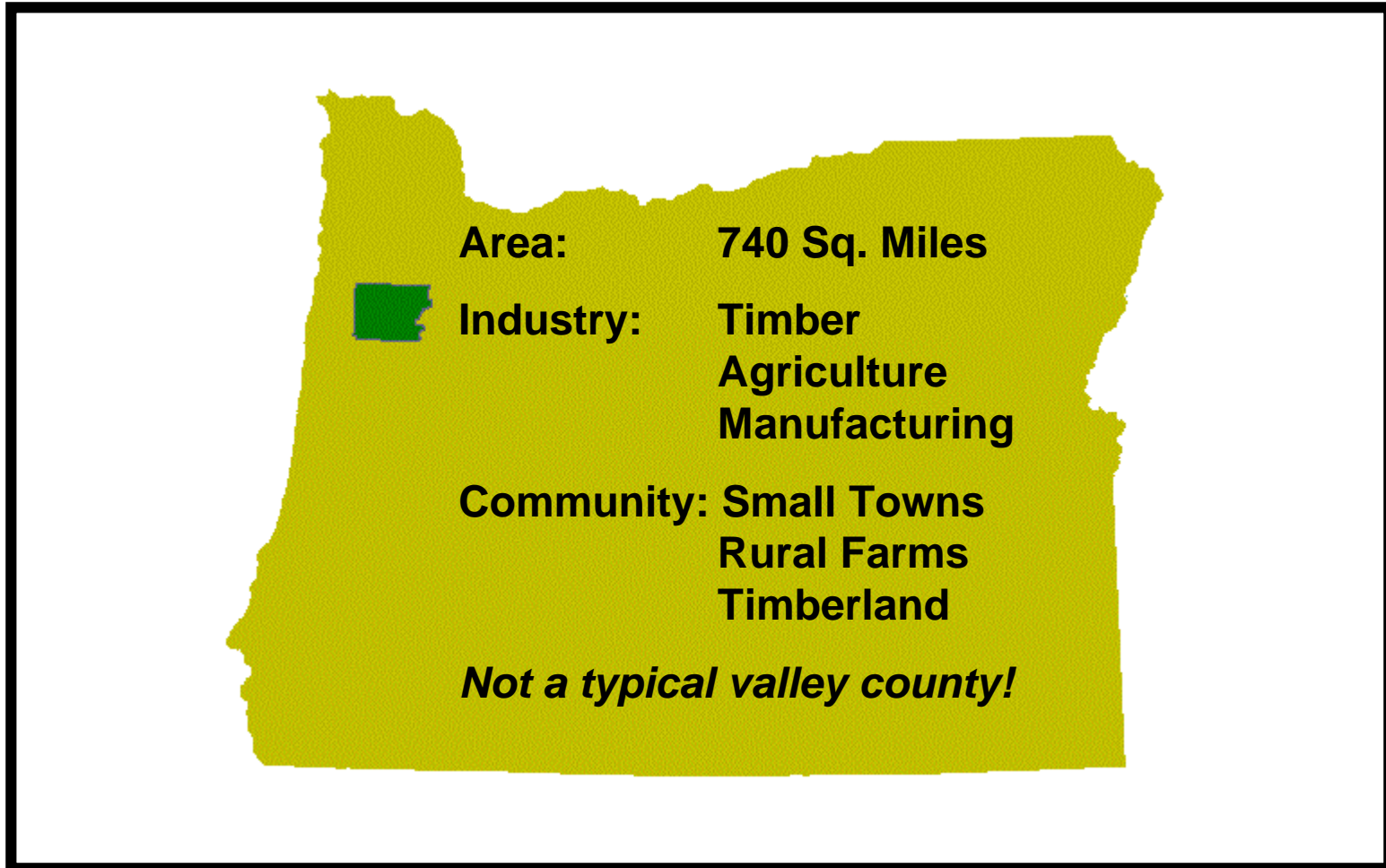
- **Free software**
- **Community of collaborators**

3. Discussion

Polk County

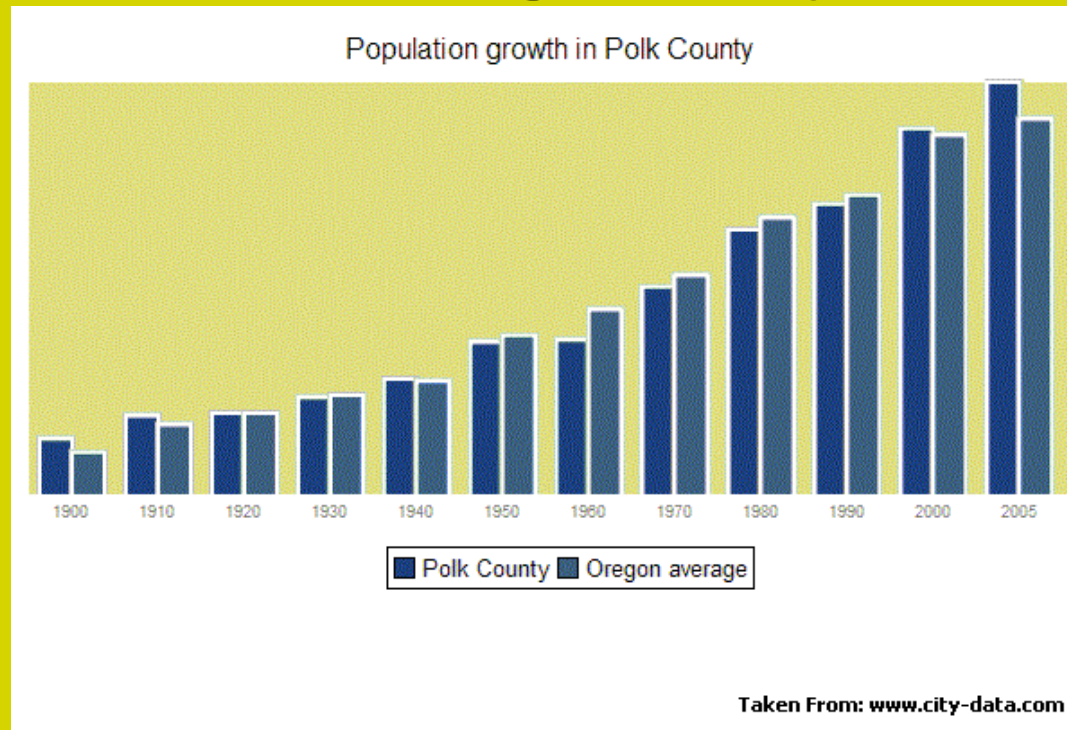


Polk County



Polk County

Population > 70,000 Growing Rapidly



Polk County

County Seat: Dallas

Employees: 280

Total Budget: \$45 million

Local Government: Board of Commissioners
County Roads



Health
Community Dev.

County Fair

Polk County GIS

GIS Budget: \$283,000

**2 1/3 Staff: 1 Cartographer (Grant Project)*
(1 1/3) 1 Programmer/Support
 1/3 Programmer/Coordinator**

**Users: 100+ Desktop Mapping Users
 10 Basic Editing Users
 6 Advanced Editing Users
 2 Advanced Users (my staff)
 1000+ Web Users**



*** 100% Grant Project**

Polk County GIS Goals

Goal 1: Make it better, faster, cheaper

Goal 2: Manage land information as a county-wide asset


Goal 3: Provide tools and access so users focus on their jobs and not technology

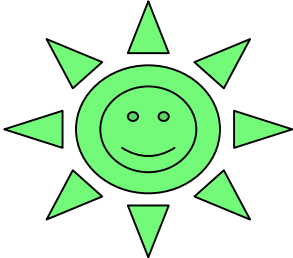
Goal 4: Ensure land information and GIS tools are proven, secure and reliable


Please remember...

- I used to work (10 years) for a software company (ESRI) as a manager/programmer/trainer, etc. and am pretty familiar with GIS technology
- I am not a researcher (I was one long ago) and do not get paid to be on the bleeding edge. I can not afford surprises
- I have few staff & lots & lots of users (>1:100+)
- I have less then \$25K annually to spend on new hw/sw, hw/sw maintenance, training, conferences, etc..
- I have seen lots of new technology/terms come and go
- I want to meet my GIS goals and have happy users (that means keep complaints to a minimum)
- I usually ask my staff “why do we need it?”
- Finally, I would rather ride my horse than find a problem to fix to justify a new and cool technology

Case Studies

Case Study 1: Using open source “free” software to develop a web based mapping tool. 

Case Study 2: Developing a community of collaborators to share software and development responsibilities. 

A yellow, torn-edge paper graphic with a textured, slightly grainy appearance. The paper is irregularly shaped, with jagged edges, and is centered on a white background. The text is printed in a bold, black, sans-serif font on the paper.

Case Study 1
Using Open Source
“Free” Software

Mapping Tool

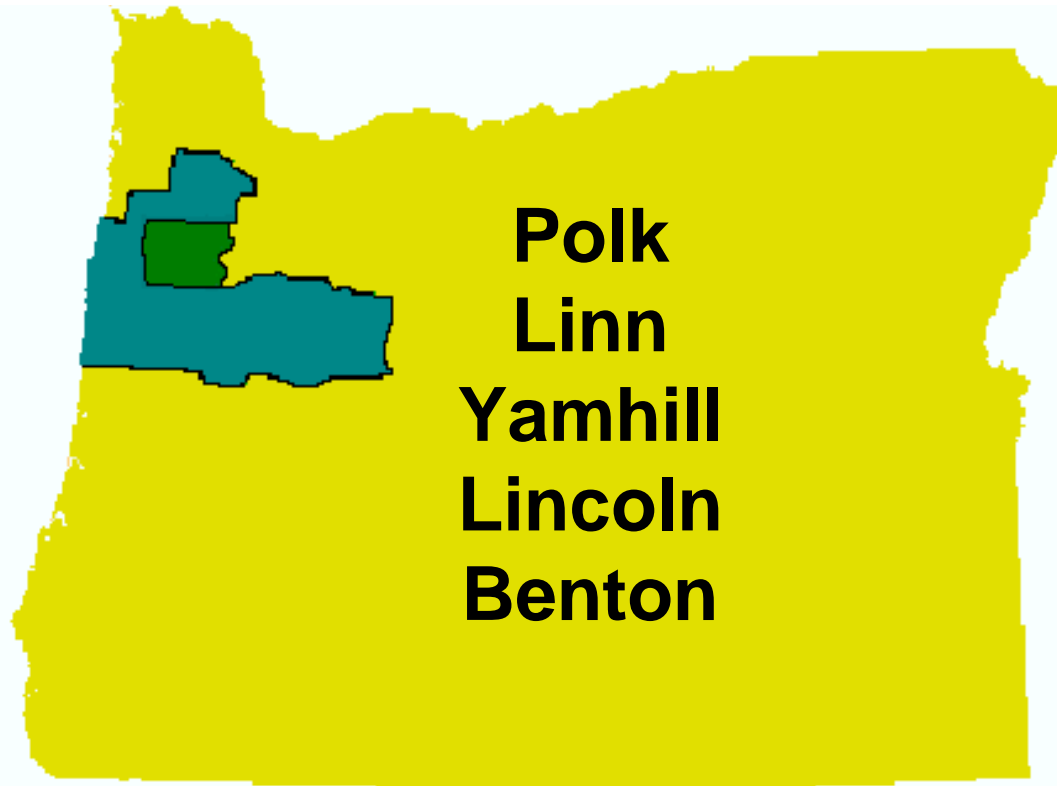
Case Study 1: Free Software

The Problem: The public needs to use maps and map related documents without coming into the county courthouse (2000).

- Visits to the county cost staff time & resources
- When the public arrives at the county they often do not know what questions to ask because they do not know where they live
- The GIS division has few and limited resources
- Need to provide better service to staff and public

Case Study 1: Free Software

Partnered with other counties..



**Polk
Linn
Yamhill
Lincoln
Benton**






Case Study 1: Free Software

Possible Solution: Create a web-based mapping tool.

- Very fast
- Easy to use
- Good functionality
- Adaptable
- No downloading to make it work
- Supported

Case Study 1: Free Software

What we did..

-  Found software alternatives
(Had to be compatible with what we had)
-  Identified requirements
-  Evaluated software alternatives
-  Built and tested an application
-  Monitored success or failure

Case Study 1: Free Software

Software Alternatives Examined

- **MapServer**

Free “Open Software” Tool (mapserver.gis.umn.edu)

- **ESRI ArcIMS**

Industry Standard Tool (www.esri.com)

- **3rd Party ESRI Products**

Industry Tool + Services

- **ALTA4**

ESRI Business Partner

All five counties used ESRI software for
GIS

Case Study 1: Free Software

Requirements..

- **Speed:** Must be fast
- **Adaptable:** Easily customized
- **Cost:** Must be cheap
- **Support:** Must be supported
- **Examples:** In production & looking good
- **Interviews:** Must have happy users
- **Functionality:** Have needed functions

Case Study 1: Free Software

Functions..

- **Simple to use:** Like an ATM
- **Basic Map Tools:** Pan/Zoom In/Zoom Out/Zoom to location/place
- **Query:** Locate feature based on query
- **Multi-Layers:** Display multiple layers and feature types including aerial photos
- **Identify:** Point at a feature and display attributes
- **View Attached Docs:** Link to documents and related materials
- **Good Looking Map:** Map has to look good
- **Data Formats:** ESRI shape files and Tiff Images

Case Study 1: Free Software

Evaluation Results – Map Server

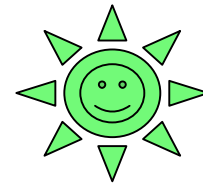
- **Speed:** MapServer/ALTA4 
- **Adaptable:** MapServer / 3rd Party ESRI 
- **Cost:** MapServer /ALTA4 
- **Support:** ESRI / 3rd Party ESRI
- **Examples:** MapServer 
- **Interviews:** MapServer / 3rd Party ESRI 
- **Functionality:** A Tie 

Case Study 1: Free Software

Developed two tools:

- Graphic Support/Admin Tool (Polk Co)
- Web Based Tool (Linn Co)

Cost: < \$25,000 or < \$5,000/County



Time to develop: Months

Time to install/customize: A Few Days

Installed: Linn, Polk, Yamhill, Benton

In place: Stable for several years

Software used: MapServer on Microsoft

Case Study 1: Free Software

We had a success!

- Public is using it
 - More then >10,000 Start Hits / Month
- Reduced surveyor visits by 99%
 - Saves county 1/3 person (\$12,000/yr)
 - Did not replace two \$10,000 machines
- Phone staff are referring public to it
- Feedback is positive
- It is “easily” maintained (it works)
 - 40 hours per year

Case Study 1: Example

The screenshot shows the 'PCMaps Website Configuration' application window. It is divided into several sections:

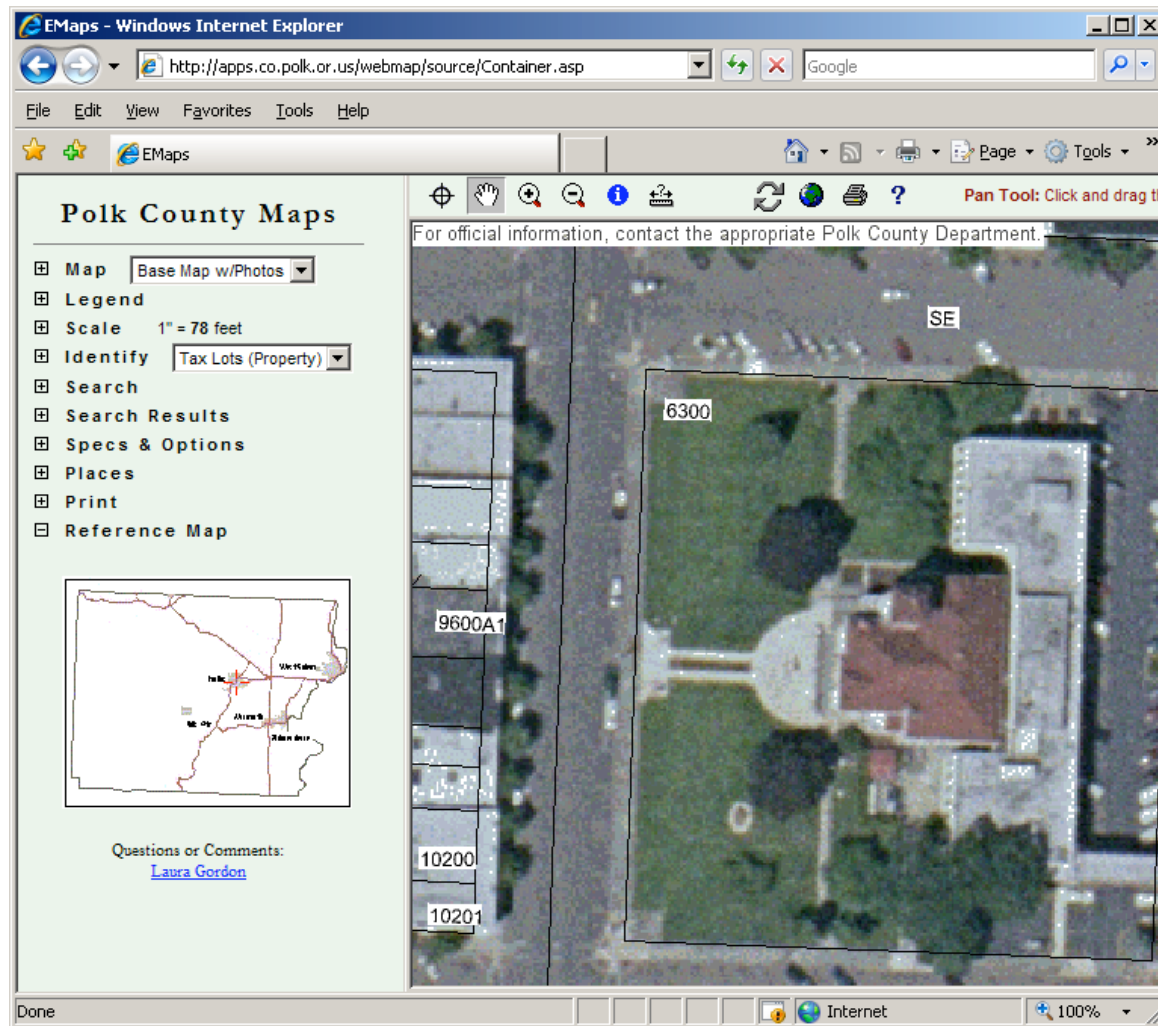
- Web Configuration:** A table of settings for the application, including Title, Title Link, Contact, Contact Email, Disclaimer, Application Root (Web), Application Root (Drive), and Web Server Shape Path.
- Maps:** A section for managing maps, showing a 'Map Name' dropdown (Clatsop County) and a 'Short Name' (Base). Buttons for 'Add Map', 'Edit Map', and 'Delete Map' are present.
- Available Layers:** A list of layers with columns for Layer Name, Display Name, and Theme Name. Layers include 2002 Aerial Photos, Cities, Cities Text, Com Districts, Countyline, Features, FEMA Flood, Fire District, Highway Text, Highways, Parks, PLS, PLSText, PLSTR, PLSTRText, Precinct Text, Precincts, and Road Text.
- Selected Layers:** A list of layers currently selected for the map, including Cities Text, Highways, Roads, Road Text, Taxlot Text, Taxlot Acres, Taxlot Measurements, Taxlot Arrows, Taxlots, Taxlots Text, Tax Map, PLS, PLSText, PLSTR, PLSTRText, Parks, Water, and 2002 Aerial Photos.

Annotations with arrows point to specific areas:

- Web Controls:** Points to the 'Web Configuration' table.
- Themes:** Points to the 'Maps' section.
- Origin Layers:** Points to the 'Available Layers' table.
- Layer Order Per Theme:** Points to the 'Selected Layers' table.

AdminTool - ESRI Map Objects & VB 6.4

Case Study 1: Examples



www.co.polk.or.us - Interactive Maps

Case Study 1: Examples

The screenshot shows the EMaps web application interface. The main map area displays an aerial view of a property with several tax lots outlined in cyan. Lot 701 is highlighted with a cyan arrow and labeled "My Barn". Other lots shown include 700 (48.20 AC), 902 (1.12 AC), and 901 (0.90 AC). The total area for lot 701 is 48.07 AC. A sidebar on the left provides detailed information for the selected tax lot.

Polk County Maps

- Map: Base Map w/Photos
- Legend
- Scale: 1" = 352 feet
- Identify: Tax Lots (Property)
- Search
- Search Results

Map Tax Lot - Click to See Assessment Report

Account Number	168645
Image	Map Image
Map	8.5.18
TaxLot	701
Owner	ANDERSON DEAN RUSSELL ET AL
Agent	
Mailing Add	15840 GUTHRIE RD
City	DALLAS
St	OR
Zip	97338
Primary Situs	15840 GUTHRIE RD DALLAS
Property Class	481
Num Residences	0
Num Buildings	4
Acre	48.07
AV Total	44270

Map Tax Lot - Click to See Assessment Report | Account Number | Image | Map | TaxLot | ANDERSON D

851800 701	168645	Map Image	8.5.18	701	ANDERSON D
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www.co.polk.or.us - Interactive Maps

Case Study 1: Examples

POLK COUNTY WEB
Real Property Map Summ
Current Tax Ye:

Account Info
Map Taxlot: 851800 701
Account Number: 168645
Acres: 48.07
Sq Ft: 2093930
Primary Situs: 15840 GUTHRIE RD DALLAS

Owner Info
Owner: ANDERSON DEAN RUSSELL ET AL
Mailing Address: 15840 GUTHRIE RD DALLAS, OR 97338

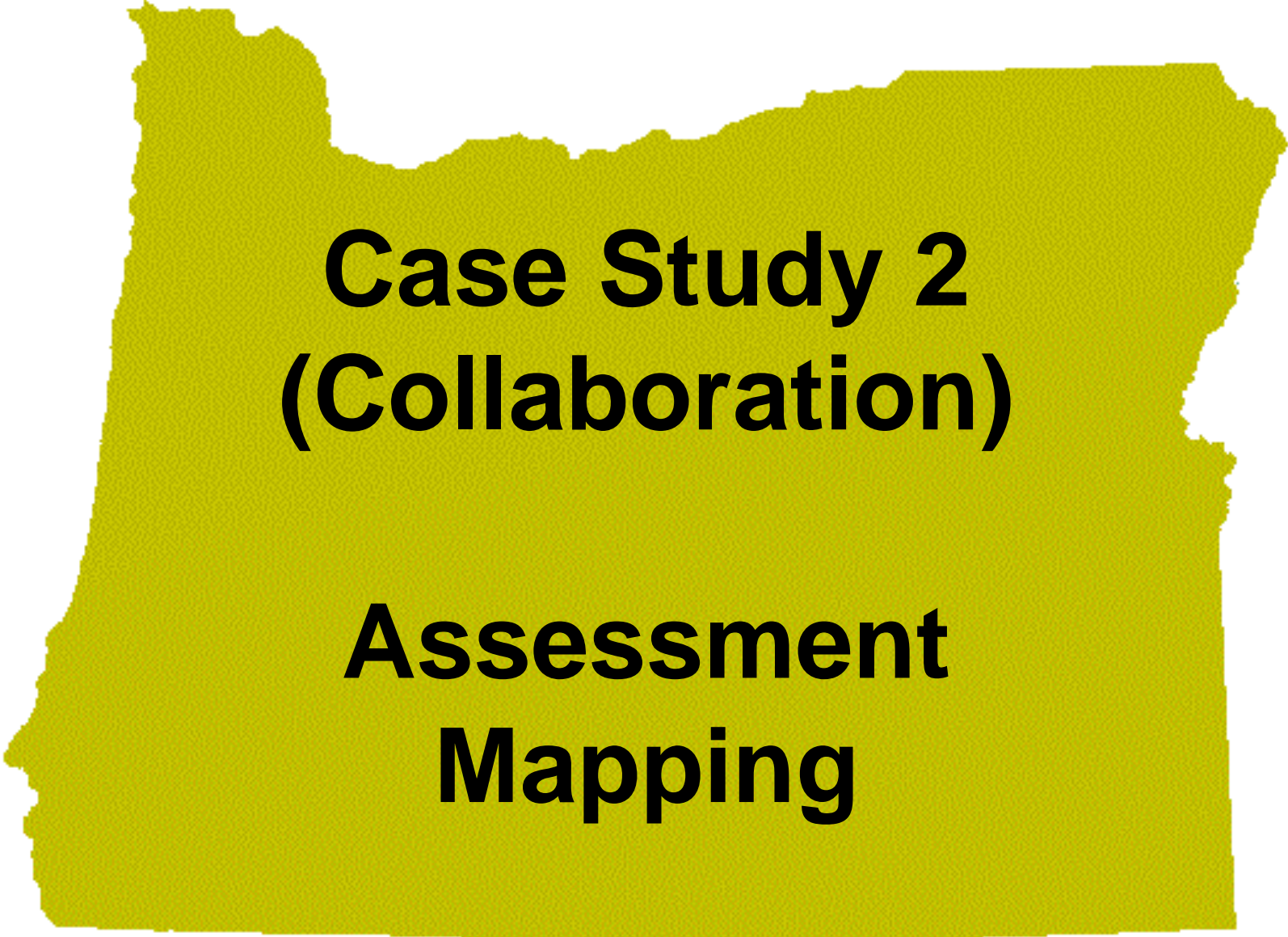
Value Summary Info (AV: Assessed Value, RMV: Real Market Value)

Taxcode:	AV Land:	AV Impr.:	AV Total:	RMV Land:	RMV Impr.:	RMV Total:
0204	4890	39380	44270	311090	47570	358660
			=====			=====
Grand Total			44270			358660

Value Unit: 6059-2

Case Study 1: Comments

- Purchase price can not be beat
- Support is variable & “Community” support takes some getting used to
- Sometimes too much source code variation
- System requirements not always clear and variable depending on which sub-version is selected
- The old saying “you get what you pay for” is so totally not true
- Good source of stable functional software
- Open Source tools have become part of our “toolbox”
- Should be evaluated like an other software

A yellow, torn-edge paper graphic that serves as a background for the text. The edges are irregular and jagged, giving it a hand-cut appearance.

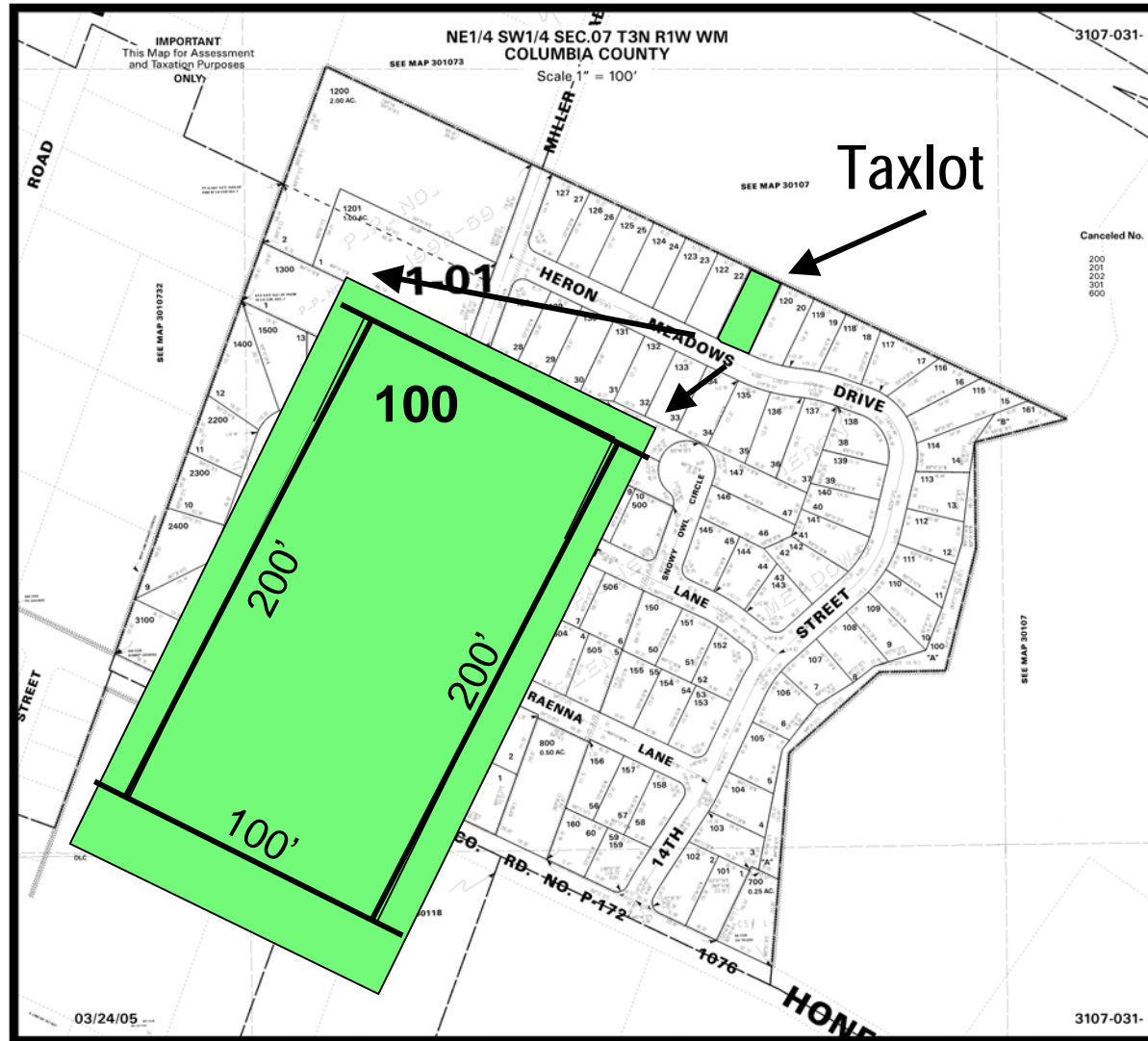
Case Study 2 (Collaboration)

Assessment Mapping

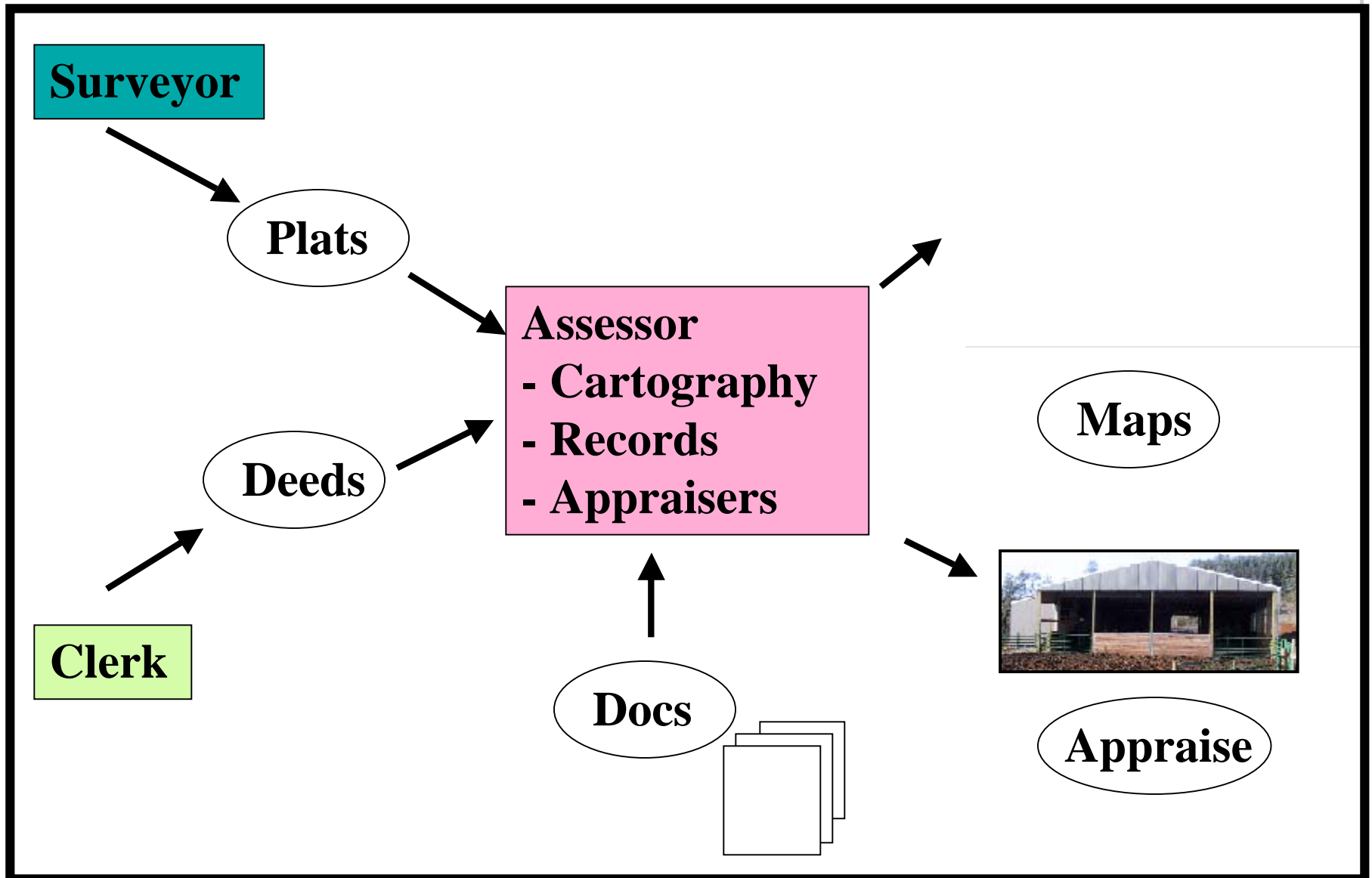
Case Study 2: Background

- Oregon DOR directs the mapping of property in Oregon for Assessment Purposes.
- Program has been in place since 1950's.
- Every county is responsible for making maps and making the maps accessible to the public.
- DOR under contract maintains maps for some counties.
- A map standard exists and was updated for the digital environment in the mid-1990's.
- Maps have several scales **1:100-1:2000 FEET!**

Case Study 2: Background



Case Study 2: Background



Case Study 2: Background

- **1999 Legislature – Add \$1 to recording fee**
- **Gave funding to DOR to develop “OregonMap”**
- **Use a semi-annual grant cycle to provide funding to assist counties to create and make available better tax maps**

Case Study 2: Background

Users of ESRI software built a “user group” because..

- Have similar legacy systems (10-20 yrs old)
- Want to stay with ESRI technology
- Need a new database design
- Must still produce a “standard product”
- Cartographic users are not GIS professionals
- Counties have limited resources
- Similar business processes

ESRI ORMAP USER GROUP

(www.ormap.org)

Case Study 2: Background

IMPLEMENTATION STEPS

1. Initial Needs Assessment
2. Preliminary Design
3. Review of Capabilities
4. Database Design
5. Database Tests
6. Tool Prototypes
7. Make Tools

* Done with help from ESRI NW and Nancy Von Meyer

Case Study 2: Collaboration

General Problem: Cartographers need tools to edit taxmap features and produce maps that meet state standards.

- Counties have similar business functions
- Cartographers are not trained GIS professionals
- Counties have a very small pool of programmers & analysts
- Counties have a vested interest in making tools

Case Study 2: Collaboration

Tool Development Problem..

➤ **Technical Resources**

Distributed programmers with limited time

Can not afford ESRI or contract programmers

Want to avoid being locked to one developer

Want innovation & faster development

Want the community to evolve and grow

➤ **Software**

➤ ESRI software needs to be customized

➤ Same/similar software problems

➤ Want maintainable software

➤ **Willing to bear disadvantages**

Case Study 2: Collaboration






What we did..

Developed an “Open Source” process for sharing resources and developed *Release 1.1* of the software for ArcMap 9.2 with CoGo

- Editor Tools – Clackamas & Polk (VB & VBA)
- 18x20 Map Tool – DOR and Lane (VBA)
- 18x24 Map Tool – Clatsop and Marion (VBA)
- SW Administration – Clackamas
- Group Coordination – Polk

Case Study 2: Collaboration

How we did it.. Made Cooperative

-  Decided we were desperate enough to risk a joint development process
-  Counties & DOR volunteered staff
-  Developed an organizational structure (central support model) to make it happen
-  Started to develop code
-  Developed tools using web technology to manage and share code
- Developed our first release

Case Study 2: Collaboration

How we did it.. Coding Standards

- Match what has already exists in the tools code from ESRI
- No data type suffixes (!, @, \$, %)
- No "my" ...
- Add header see add-in from James, ask him to modify it to be a bit shorter
- Releases of source forge have line numbers only when they are in the trunk (master copy)
- Delete any code that is no longer needed.
- Prefixes: s = string, b = Boolean, i = integer, m = module, g = global
- Use the following abbreviations: MI MapIndex, TL Taxlot, FC Feature Class, Def Default Values, C Cartographic lines
- Use "p" for Pointer
- Add comment to the top where your work has been added...
- Set variables to nothing at the end of the functions.
- Consistent indentation

Case Study 2: Collaboration

How we did it.. Created A Process

1. County "user" requests a change (enhancement or bug fix) using source forge
<http://sourceforge.net/projects/opet>.
(County programmers or any county in the ORMAP group can partner with a tools committee member to discuss and take on a tool request)
2. Tools Committee member volunteers to code and fills out "Tool Design Document" and presents it to the Tools Committee
3. Tools Committee approves project & another county volunteers to test
4. County performs work and places code into the county's branch in Source Forge

Case Study 2: Collaboration

How we did it.. Created A Process

5. Testing county reviews work (both user environment and programming)
6. County presents the tool to committee who accepts/rejects tool for the next general release so county can get paid by ORMAP.
7. Source forge administrator merges code for next general release
8. Present new tools to the general committee
9. Counties test next release
10. Next release is published

Case Study 2: Collaboration

How we did it.. Design Document

➤ OVERVIEW

- Tool Name (short 10 word description ie: adding annotation hooks)
- Justification (why do it):
- Brief Deliverable Overview (proposed solution):

➤ REQUIREMENTS (Complete before review)

- Current Process Summary (how does it work now):
- Desired Process Summary (how should it work):
- Assumptions/Constraints:

➤ DESIGN (Complete before review)

- Start & End State:
- Inputs & Outputs:
- Process:
- User Interface:

Case Study 2: Collaboration

How we did it.. Source Forge

The screenshot shows a Microsoft Internet Explorer browser window displaying the SourceForge.net website. The address bar shows the URL `http://sourceforge.net/projects/opet/`. The page header includes the SourceForge logo, navigation links (Create, Participate, Evaluate), and user information (Welcome, lauragordon | Log out - We remember you | My Favorites). The main content area shows the project name "ORMAP Parcel Editing Toolbar" and a navigation menu with options like Tracker, Mailing Lists, Forums, Code, Download, Documentation, Tasks, and Admin. A dropdown menu is open under "Tracker", listing options such as Tracker Summary, Bugs, Feature Requests, Patches, and Support Requests. A green box highlights the URL `http://sourceforge.net/projects/opet/` with the text "Want your sanity back?". Another green box highlights the "SourceFORGE Request" dropdown menu with the text "*Any user can make any - - type of request.".

SourceForge.net: ORMAP Parcel Editing Toolbar - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Forward Stop Home Search Favorites Refresh Print

Address `http://sourceforge.net/projects/opet/`

SOURCEFORGE.net

Welcome, lauragordon | Log out - We remember you | My Favorites

Create Participate Evaluate

SF.net Projects My Page Help

`http://sourceforge.net/projects/opet/`
Want your sanity back?

SF.net » Projects » ORMAP Parcel Editing Toolbar » Summary

ORMAP Parcel Editing Toolbar

Project Tracker Mailing Lists Forums Code Download Documentation Tasks Admin

Tracker Summary
Bugs
Feature Requests
Patches
Support Requests

Download
Toolbox
Statistics
Reporting
Search

Project Admin
Operating System: Windows (95/98/NT/2000/XP)
License: GNU General Public License (GPL)
Category: GIS (Suggest?)

SourceFORGE Request
*Any user can make any - - type of request.

Case Study 2: Collaboration

How we did it.. Making Requests

SourceForge.net
Welcome, lauragordon | Log out - We remember you | My Favorites
Create Participate Evaluate SF.net Projects My Page Help
Search Advanced

Get splunk™ The search engine for logs and IT data.

SF.net » Projects » ORMAP Parcel Editing Toolbar » Tracker » Feature Requests » Browse Tracker Items

ORMAP Parcel Editing Toolbar

Project Tracker Mailing Lists Forums Code Download Documentati

Submit New Browse Reporting Admin

Assignee: (?) Status: (?) Category: (?) Group: (

Any Open Any Any

Show only: Submitter username (show mine) : Sur Keyword:

Sort By: (?) ID Descending

Request ID	Summary	Open Date
<input type="checkbox"/> 1649937	Annotation Tool	* 2007-02-01 07:58
<input type="checkbox"/> 1649936	Dimension Arrows	* 2007-02-01 07:56
<input type="checkbox"/> 1598065	Create Hot Keys	* 2006-11-16 14:57

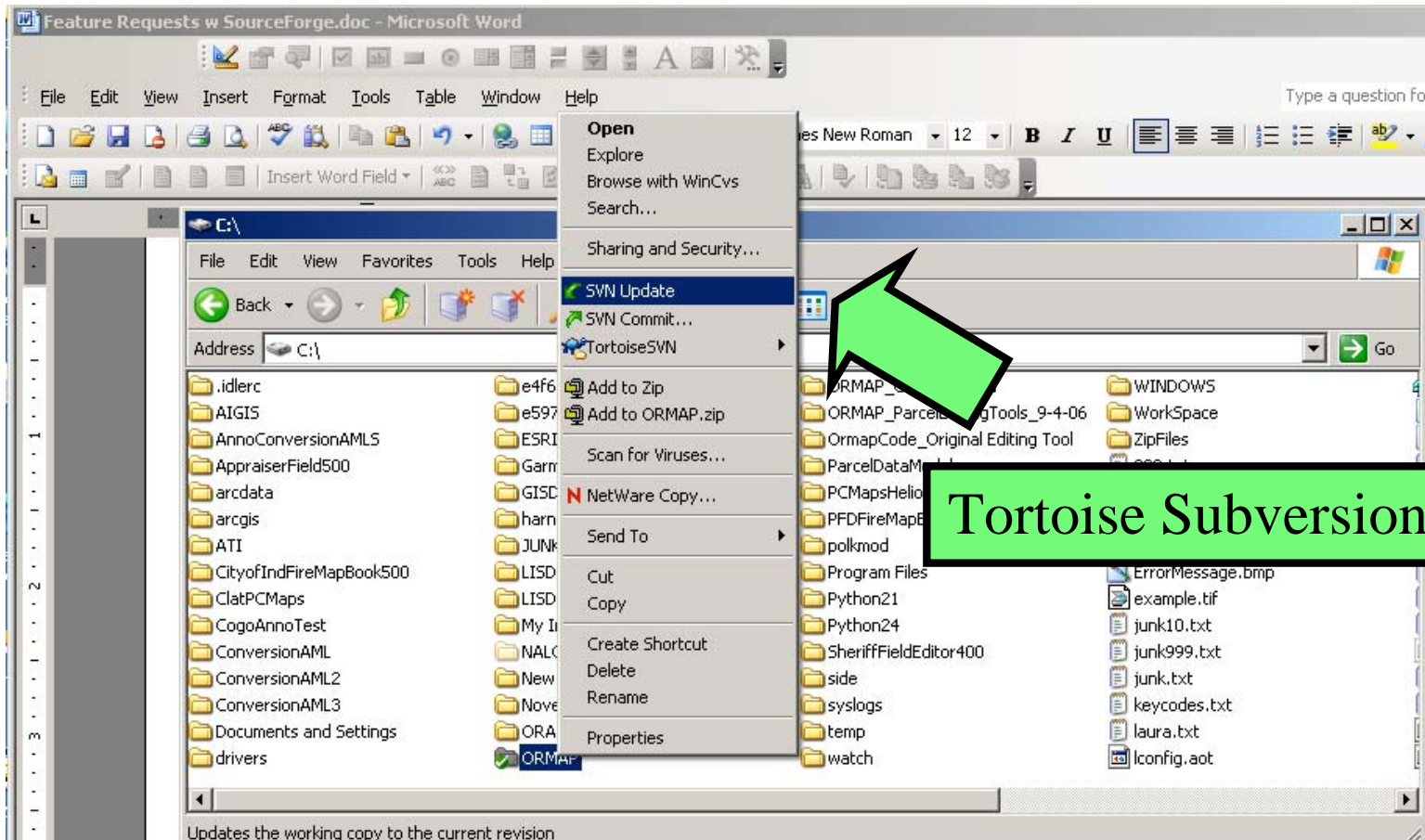
Check All - Clear All

Requests

- * Any county can take on any project but funded projects need to be agreed upon.

Case Study 2: Collaboration

How we did it.. Managing Code



Use Subversion's update function to get software

Case Study 2: Collaboration

How we did it.. Issues

- **Needed a SW administrator & WEB host**
Clackamas County & Department of Revenue
- **Needed volunteer developers**
Clackamas, Clatsop, Lane, Marion, Polk, DOR
- **Had limited funding**
Counties can spend any amount of money on coding but ORMAP funds are limited.
- **Needed user documentation & helps**
- **Mixed open/licensed SW environment**

Case Study 2: Collaboration

How we did it.. Released Code

- Editor 1.1 is done and available
- 18x20 Plot Production works
- 18x25 Plot Production is in testing
- First version of helps completed

- Software Released This Past Spring

Case Study 2: Collaboration

What will we do next..

- Get cartographers converted and trained
- Convert to “.net” environment
- Create more tools for editing
- Create tools for quality control
- Get better at help files

Case Study 2: Collaboration

We had success!

- We collaborated (ideas/techniques were shared)
- We developed a process
- We followed the process
- Members focused on areas of interest
- We lost & replaced programmers
- We released code
- We continue to work together
- Users are using the application

Case Study 2: Example

DimensionArrows.mxd - ArcMap - ArcInfo

File Edit View Insert Selection Tools Window Help

Taxlot Assignment

Type of Polygon: NUMBER

Auto Increment Options

None 1 10 100

Starting From: _____

Help

Layers

- Taxlot
- MapIndex

Selected Attributes of Taxlot

OBJECTID	SHAPE	County	Town	TownPart	TownDir	Range	RangePart	RangeDir	SecNumber	Otr	OtrOtr	Anomaly	MapSufType	MapS

Record: [Navigation icons] Show: All Selected Records (0 out of *2000 Selected) Options [Icon]

Case Study 2: Comments

- We were desperate and willing to try anything
- “Open Source” model happened (evolved/suggested) - we did not go looking for it
- Required a vested and interested group
- Worked because members are willing to compromise and follow self imposed rules
- Work was divided up by vested stake holders who volunteered to address their needs
- Members trusted each other to get work done
- Needed a software administrator
- Needed a group facilitator (informal)
- Needed some control on software development