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Broad Use of Digital Parcel Maps and Property Tax Base Growth

by Dennis H. Klein

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Broad Use of Digital Parcel Maps and Property Tax Base Growth

Dennis H. Klein

The statements made or opinions expressed by authors in Fair & Equitable do not necessarily represent a policy position of the International Association of Assessing Officers. At the 74th Annual International Conference on Assessment Administration in September 2008, a panel on open records responded to the question, "Does unconstrained sharing of digital cadastral databases stimulate the economy?" This article summarizes the panel's answer to that question.

If broad use of a county's digital parcel map increases local economic activity on average, then the growth rate of the county's property tax base increases as well. If broad use of digital parcel maps accelerates tax base growth, then arguably, digital parcel map operations could be self-funded by simply tapping, at budget time, the very tax revenue increases they cause.

The first part of this article concentrates on whether there is a correlation between open records (Public Records Act [PRA] compliant parcel maps) and accelerated tax base growth. (PRA-compliant counties are those whose annual licensing fee is less than \$250.) If there is such a correlation, then even a slight increase in the tax base equates to millions of additional dollars of property tax revenue that quickly dwarf even the most ambitious data-licensing schedules. The second part of this article speculates on the possible reasons for this correlation.

To support this examination of whether there is a correlation between the broad use of digital parcel maps and local tax base growth, Boundary Solutions, Inc. (BSI) has assembled a National County Annual Reports Database (NCARD) and posted it on the Internet for broad use (<http://www.npddownload.com/NCARD.xls>). NCARD contains records for all 3,140 U.S. counties. In addition to population and core based statistical area (CBSA) designation, records include the informational elements and record counts listed in table 1. (CBSA is the Census Bureau's term for a functional region based around an urban center of at least 10,000 people, according to Office of Management and Budget standards.) Readers can download NCARD to see how it can be used to test the following findings and to examine with greater confidence a wide range of county-level economic trends and comparisons.

Correlation of Tax Base Growth with Open/Closed Records

To determine the effect of open versus closed records on tax base growth, two procedures were used: *gross* correlation of all pertinent counties and *filtered* correlation of counties selected according to new development intensity. A gross correlation was performed by comparing the total valuation of all open-records counties with closed-records counties that have a *full* NCARD record. Total valuation for each year was compared with the total valuation of the prior year, that is, $(2002 \text{ valuation} - 2001 \text{ valuation}) \div 2001 \text{ valuation}$. The resulting difference between the percentage growth of all open-records counties and the percentage growth of all closed-records counties in the sample was determined. As shown in table 2 and figure 1, the growth rates of closed-record counties are ahead of those of open-records counties at

Table 1. Information contained in NCARD

Element	Source	Record Count
Total valuation of all parcels for 2001–2006	46 state revenue departments	2,886
Total permits issued 2001–2006	U.S. Department of Housing and Urban Development Office of Policy Development & Research	3,055
Data availability/readiness (RED) Open (data fee <\$250) Closed (data fee >\$250) No map	National ParcelMap Data Portal Metadata Profile Database	3,036
Total full records, each of which contains tax base, permit and verified availability/readiness		2,784

Table 2. Comparison of growth in property tax base for open-records counties versus closed-records counties for 2001–2006

All Counties							
	Total Counties	2001	2002	2003	2004	2005	2006
<\$250 Open Records		804					
Total Property Tax Base		\$6,419,730,941,032.86	\$6,994,957,202,002.16	\$7,595,186,716,502.49	\$8,252,578,788,672.23	\$9,147,686,978,098.75	\$10,260,333,874,674.10
Total Value/Total Counties		\$7,984,739,976.41	\$8,700,195,524.88	\$9,445,505,866.30	\$10,264,401,478.45	\$11,377,720,122.01	\$12,761,609,296.86
% Annual Growth			9.0%	8.6%	8.7%	10.8%	12.2%
>\$250 Open Records		348					
Total Property Tax Base		\$3,115,863,953,784.00	\$3,424,666,471,756.00	\$3,757,082,417,460.00	\$4,022,715,253,358.00	\$4,399,984,103,568.00	\$4,852,925,836,765.00
Total Value/Total Counties		\$8,953,632,051.10	\$9,840,995,608.49	\$10,796,213,843.28	\$11,559,526,590.11	\$12,643,632,481.52	\$13,945,189,186.11
% Annual Growth			9.9%	9.7%	7.1%	9.4%	10.3%
Open Compared To Closed Records			-9.6%	-11.7%	22.6%	15.7%	18.2%
High Activity Counties: <50 People Per Permit							
<\$250 Open Records		559					
Total Property Tax Base		\$4,997,557,834,030.67	\$5,457,001,697,626.54	\$5,941,764,800,259.49	\$6,467,190,482,525.36	\$7,240,498,680,149.86	\$8,181,004,817,354.18
Total Value/Total Counties		\$8,940,175,016.16	\$9,762,078,171.07	\$10,629,275,134.63	\$11,569,213,743.34	\$12,952,591,556.62	\$14,635,071,229.61
% Annual Growth			9.2%	8.9%	8.8%	12.0%	13.0%
>\$250 Open Records		274					
Total Property Tax Base		\$2,456,867,423,310.00	\$2,710,992,479,361.00	\$2,971,893,435,882.00	\$3,169,121,895,865.00	\$3,479,554,089,973.00	\$3,839,950,560,480.00
Total Value/Total Counties		\$8,966,669,428.14	\$9,894,133,136.35	\$10,846,326,408.33	\$11,566,138,306.08	\$12,699,102,518.15	\$14,014,418,103.94
% Annual Growth			10.3%	9.6%	6.6%	9.8%	10.4%
Open Compared To Closed Records			-11.0%	-8.0%	33.0%	22.0%	25.0%

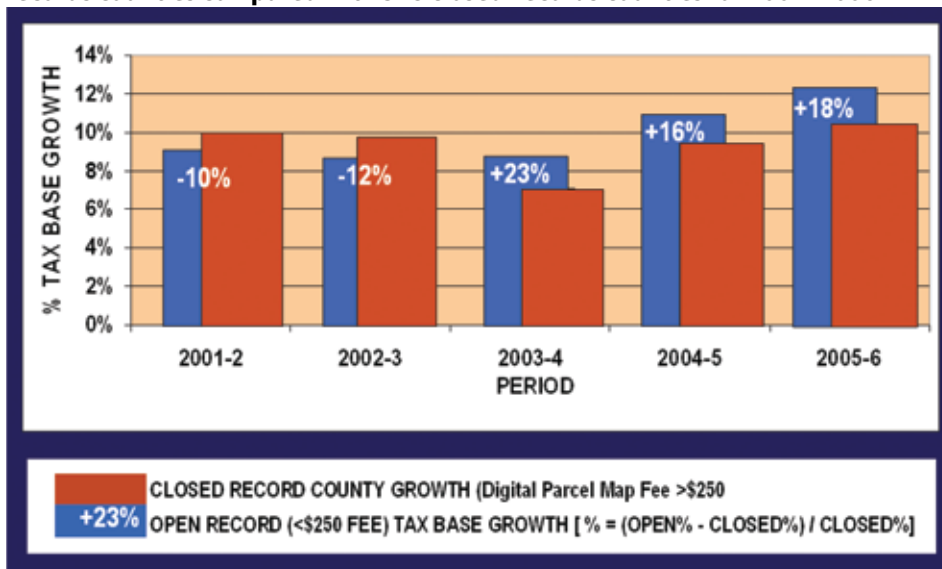
first; then open-records counties surpass closed-records counties as indicated by an expanding divide, arguably commensurate with the rapidly expanding proliferation of digital parcel maps between 2001 and 2006.

Debatably, in the gross analysis above, regional differences are balanced by the sheer record size of this large data set (representing 46 states). In an ef-

fort to ensure a correlation that better compares apples with apples, a *filtered correlation* was conducted by identifying only those counties in which there had been high development activity. Data on the total number of permits issued for each year in each county from 2001 to 2006 were obtained from the U.S. Department of Housing and Urban Development Office of Policy Development & Research. The total population of each

county was then divided by its total 6-year permit count to derive the total population per permit for each county. To filter out all the less active counties from the sample, all counties with greater than 50 persons per permit were eliminated—the bottom 30 percent of open records and 20 percent of closed-records counties. As shown in figure 2, this result shows a more positive correlation than the gross records analysis above.

Figure 1. Gross (all records) correlation for property tax base growth of 804 open-records counties compared with 348 closed-records counties for 2001–2006



Bell Curve Analysis

To further examine these findings, the county samples in the filtered correlation were used to compare the number (count) of counties in both samples that fall within a single percentage growth regime (i.e., 130 percent; all counties with a growth rate of 130 percent–139 percent) as follows:

- The growth rate of each county was calculated as the 2006 total assessed value divided by the 2001 total assessed value.
- Various growth rates were sorted from lowest to highest.
- The number of counties in each 10 percent growth range (regime) was tallied.

- Low incident regimes at the high and low end of the spectrum were eliminated.
- The percentage of sample counties value was determined by dividing the count of counties in each percentage tax base growth regime by the total sample size:
 - PRA-compliant sample size, 704 counties.
 - PRA-noncompliant sample size, 253 counties.

The resulting PRA-compliant and PRA-noncompliant distribution curves (figure 3) show that open-records counties have higher tax base growth rates. Note the propensity of the annual growth rates of closed-records counties to be in the lower-tax-rate regimes and those of

the open-records counties to be in the higher-growth-rate regimes. Figure 2 displays the tax base growth rates on a per-year basis. Figure 3 shows performance relative to total growth over the entire 6-year period.

Counties with No Map

According to the data in figures 1 through 3, there appears to be a correlation between open-records counties and an increased tax base growth when compared to closed-records counties. This correlation should be investigated further. Closed-records counties that become open-records counties can arguably fund their map maintenance and improvement operations by tapping, at budget time, the increased tax revenues they cause.

The ultimate closed-records county is one without a digital parcel map. In no-map counties there is no availability due to the lack of a map to share. In closed-records counties there is no availability due to a price prohibitively too high for most potential users. Therefore, no-map counties could be expected to perform somewhat like closed-records counties. In fact, the digital divide is even greater for no-map counties than for open- versus closed-records counties.

More than 1,600 counties in the United States do not have a map; many of them are highly rural, non-urban jurisdictions far from a freeway. The number of transactions in these remote counties each year is so low that the savings to be realized through automation is insufficient to pay back the initial investment. As a result, many of these no-map counties do not even have plans for adding a digital parcel map anytime soon. For reasons discussed in the next section, these counties are not at parity with their digital cousins in attracting investment. Moreover, this digital divide will only widen as more capital flees to counties where every deal can be spatially analyzed relative to every other parcel in the county and region, and can be viewed from a PC anywhere versus one map page at a time at the county seat. In an attempt at an apples-with-apples comparison of no-map counties with open-records (map) counties, only NCARD records with the following profile were included in both the open-map and no-map counties: population <50,000 and not in a CBSA (indication that both map and no-map counties are rural, not in metro areas).

Figure 2. Filtered records correlation for property tax base growth of 559 open-records counties compared with 274 closed-records counties for 2001–2006

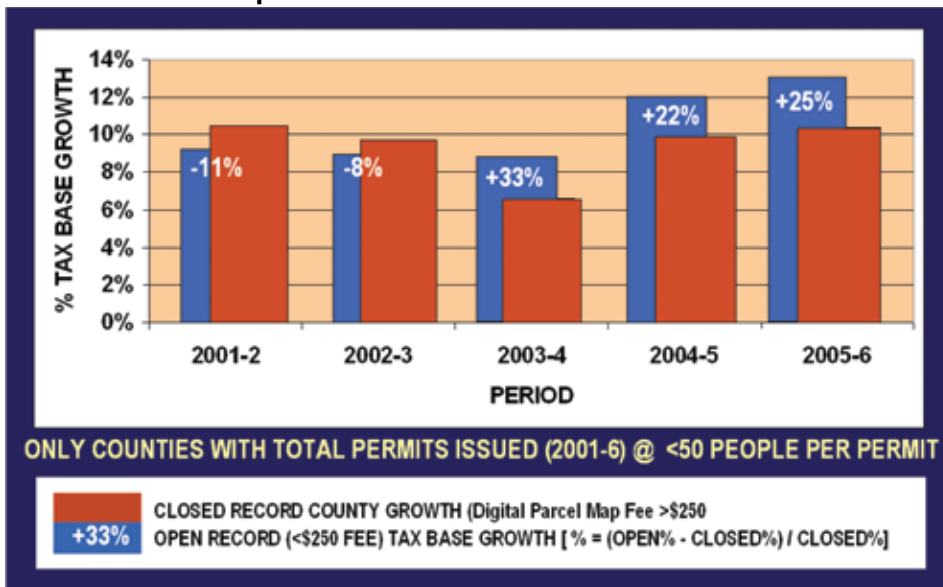
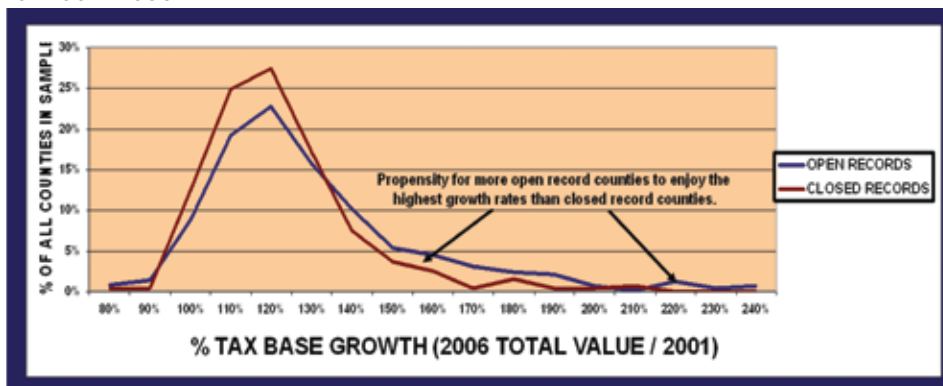


Figure 3. Distribution curves of filtered records correlation for property tax base growth of 559 open-records counties compared with 274 closed-records counties for 2001–2006

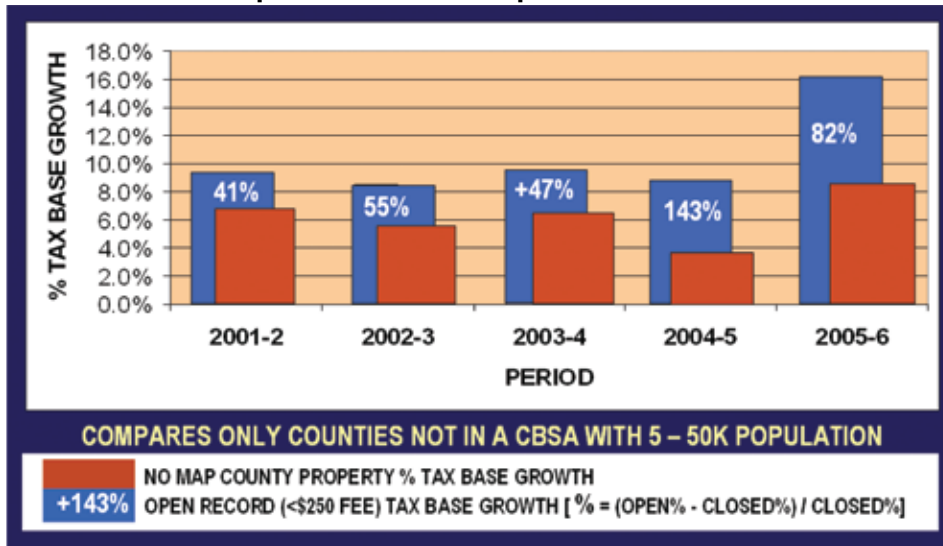


As shown in table 3 and figure 4, unlike the comparison of tax base growth rates between open- and closed-records counties (a modest and possibly widening gap), the comparison between open-map and no-map counties reveals a much wider divide. The growth rates of open-records counties being up to twice that of no-map counties on average may be dismissed as caused by other factors, as long as such conjecture is within the context of both open-map and no-map samples consisting only of counties with less than 50,000 people and not in a CBSA.

Table 3. Comparison of growth in property tax base for closed-records counties versus no-map counties for 2001–2006

No Map Comparison: <50,000 Population Not In A CBSA						
<\$250 No Map Filtered Counties	199					
Total Property Tax Base		\$219,076,666,524	\$239,670,554,397	\$260,141,098,949	\$284,626,888,218	\$309,329,343,775
Total Value/Total Counties		\$1,100,887,771	\$1,204,374,645	\$1,307,241,703	\$1,430,285,870	\$1,554,418,813
% Annual Growth			9.4%	8.5%	9.4%	8.7%
No Map Filtered Counties	727					
Total Property Tax Base		\$376,234,108,670	\$401,367,091,026	\$423,453,163,157	\$450,577,519,820	\$466,703,013,313
Total Value/Total Counties		\$517,515,968	\$552,086,783	\$582,466,524	\$619,776,506	\$641,957,377
% Annual Growth			6.7%	5.5%	6.4%	3.6%
Open Compared To Closed Records			41%	55%	47%	143%
						82%

Figure 4. Filtered records correlation for property tax base growth of 199 open-records counties compared with 697 no-map counties for 2001–2006



The implications of figure 4 are that, rather than waiting for 10 to 15 more years for these 1,600 maps to be completed in response to current incentives, there is an opportunity to introduce new incentives to recruit loan money from the state, nongovernmental organizations (NGOs), or even the general fund. Once the payoffs are adequately understood, the process can move forward, enhancing the common wealth of taxpayers without touching it.

Reasons for Correlation

Thus far this discussion has focused on the fiscal benefits of open records. Having done that, the following is an attempt to explain the reasons for the correlation between open records and property tax base growth. However, unlike the digital divide measurements described above, the following *soft* ideas are just as subject to dismissal as any other arguments for or against open records. Backed by no

numbers, they are presented here only as possibilities.

Business Advantages

Open records enables a vast reduction in land-based transaction costs—all stakeholders can enjoy more convenient and confident title review, bank loan application, appraisal, insurance rating, site selection, community and regional development analysis, disaster prevention and response, and remediation. Cost savings can be derived from faster throughput of existing operations and productivity gains realized from new applications only when the extents of a property, not just a single point locator, are readily available. Transaction quality also is vastly improved, measured in reduced mistakes and litigation, also contributing to reduced costs.

Transparency

A basic benefit to industry is that open records, by offering information services

to all interested parties—not just those who can afford to pay—contribute to transparency, which enables government to be a more able servant to all, a catalyst to economic vitality. Conversely, lack of transparency in closed-map and no-map counties is conducive to an administrative style that makes government a servant only to those who empower the incumbents, an impediment to economic vitality. The business environment is one in which only the most capitalized can participate; all others are sidelined. In an open-records environment, all participate, causing many competing ventures to drive up the quality of what gets built, as well as the perceived location desirability. Higher sale prices and tax base growth follow.

In addition to not enjoying the accelerated tax base growth realized by offering a digital parcel map, closed-records counties can expect only a decrease in fee collection as their users opt, in light of industry trends, not to renew their data subscriptions in anticipation of the county eventually going to open records. Moreover, by constraining all but the most capitalized users from enjoying the tremendous added convenience of modern property records, closed records cause capital to flee to open-records counties, where decisions can be made in bright sunlight rather than in the dark.

Possible Mechanisms for Accelerated Tax Base Growth

BSI, as a national parcel layer service provider (NPLSP), has the advantage of being very close to the needs and aspirations of both business and government, with the private and NGO sector being on the demand side of the equation and government on the supply side. From

this perch, over the years, this NPLSP has connected the dots between supply and demand to identify four possible *mechanisms* that contribute to tax base growth in open-records counties:

- **Improved Real Estate Information Operations.** Open records spawns broad use among everyone involved in real estate, from major banks to the smallest individual brokers. When this transition from quill pen to digital data models enables everyone to do their jobs better, increased local confidence enhances the area's desirability: "location, location, location"; higher valuations; and subsequent increased property tax levies.

A basic benefit to industry is that open records, by offering information services to all interested parties—not just those who can afford to pay—contribute to transparency, which enables government to be a more able servant to all, a catalyst to economic vitality.

- **Attraction of Outside Economic Development Dollars.** Looking for *dream dirt*, developers/investors from Hong Kong to Prague to the county next door prefer to take their chances in the light of day than to muck about in a dark room. Hence, highly capitalized green investment is drawn to open-records jurisdictions where everyone can see everything versus closed-records jurisdictions, which are *invisible*.
- **Long-Term Improvement in the Built Environment.** What gets built is very much a function of local politics, permitting processes, and available information.

No change in the first two are suggested or expected. However, recently there has been a fundamental change in the third factor: Digital parcel layers are adding a spatial dimension to the analyze/plan/design/build process that optimizes what gets built. Only broad use enables ubiquitous decision-making improvement that adds up to a more attractive built environment over time; hence, perception as a more attractive location; and ultimately, higher property valuation and tax levies.

- **Reduced Insurance Premiums.** The accuracy of risk assessment is increased because a buffered point is replaced by a boundary expected to enable a 12–15 percent reduction in premium price and the underwriting needed to cover only guessing is eliminated. Since insurance is not subject to sales tax, consumer goods purchased with insurance savings are. In addition to the increased sales tax created by open records, reduced insurance costs contribute to increased desirability and hence value.

Real-World Perspective

One panel participant, Keith Johnson, from Amador County, California, stated,

Precedent does not yet exist to discuss the specific relationship between open records and tax revenues in Amador County. However, ... availability of open records gives Amador a positive and helpful image, contributing to its attractiveness as a community in which to work, build, and live.

[Open records] creates a more business-friendly environment that puts the county in a welcoming light that inspires developers to say, 'Let's work with these folks.'

According to José Crummett of El Dorado County,

[The] private-sector advantage of open records is that all use the same base map for project reviews. Constraints can be identified ahead of time. Hazards and risks can be mitigated. [There is] improved impact notification.

[The] community/NGO advantage includes developers and conservancies working together. Impacts and mitigation measures [are] identified up front.

Government advantages include improved government trust, efficiency, accuracy, and finally transparency.

Next Steps

According to Larry A. Rosenthal, J.D., Ph.D., Director of the University of California–Berkeley Program on Housing and Urban Policy and Adjunct Professor at the Goldman School of Public Policy:

For years BSI has been promoting the tax-revenue benefits of open records, and these preliminary findings are quite impressive. It does appear there may be substantial differences in property tax base growth, depending upon the extent of access to digital parcel records by all sectors. The industry, as well as federal, state, and local government officials, should stay tuned to BSI's continuing research in this area.

Comparison of the tax base growth in open-records counties with that of closed-records counties does present positive findings that warrant further examination.

Thus far, NCARD has been expanded to 2,784 records, each of which contains a combination of

- total property values for all 6 study years
- total permits issued each year from 2001 to 2006
- verified map availability (open, closed, or no map)
- CBSA code.

Because more than 89 percent of all U.S. counties are represented with a *full* record, little is to be gained by expanding the record sample. However, additional rigor is possible by adding more characteristics and filtering the record sets by other variables in other ways. Also,

analysis could be expanded by comparing tax base growth in various CBSAs. The UC Berkeley Program on Housing and Urban Policy is one possibility for conducting further work.

Conclusion

This study does not claim that broad use of digital parcel map data causes property tax base valuation growth to accelerate. However, comparison of the tax base growth in open-records counties with that of closed-records counties does present positive findings that warrant further examination. This is particularly true in the comparison of no-map counties with open-records counties. Since the profiles of the two data sets were filtered to include only counties with populations between 5,000 and 50,000 people not in a metro area (CBSA), it is debatable whether introduction of modern parcel records where there were none before will result in enough acceleration in the tax base within the first 5 years to generate property tax revenues that will recover the costs of the map. However, according to these findings, if the 349 closed-records counties go to open records, they will spawn enough increased property tax revenue to pay for the maintenance of the map without charging cost recovery (>\$250) fees.

Acknowledgments

Two California county GIS managers who joined BSI on this open-records panel were José Crummett of El Dorado County and Keith Johnson of Amador County, California. Both equally contributed most of the initial thinking reflected in the section on reasons for the correlation.

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U.S. Department of Housing and Urban Development Office of Policy Development & Research.

Dennis H. Klein, AICP PE, is President and CEO of Boundary Solutions, Inc., a National Parcel Layer Service Provider.

Dennis has facilitated panels at IAAO national conferences on digital parcel map data standards and data sharing policy.

Dennis has more than 30 years experience in GIS including the development and marketing of an AutoCAD-based parcel application that enabled hundreds of counties to start their digital parcels maps on personal computers in the 1980s.

The past 12 years have been dedicated solely to completing a 3,140-county seamless U.S. parcel layer for broad industry use.

Feeling the burden of the economic downturn?

This storage shed in Door County, WI, is awaiting an economic bailout plan. Is it possible that the electric wires and the chimney behind it are all that is holding it up?



photo by Chris Bennett

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