

A Florida County Property Appraiser's Role in "Wildfires '98"

Morgan B. Gilreath, Jr.

Before 1990, I didn't even know how to spell *damage assessment*. But in September 1989, Hurricane Hugo moved past our coast and inflicted massive damages just north of us along the South Carolina coast, right where I grew up. Some events in life get your attention, and this was one of them. It wasn't until 1993 that the plans and preparations we began after Hurricane Hugo began to bear fruit. Our reasoning, then as now, is that we, as appraisers, are the most qualified to perform any type of mass appraisals, in normal times and in times when there is a lot of property damage needing review.

The bottom line concerning damage assessment in the event of a natural disaster is that only one thing cures all but life-and-limb ills, and that is money to assist with recovery efforts. The Federal Emergency Management Agency (FEMA), Small Business Administration (SBA), and other relief agencies are very easy to work with and, like the local jurisdictions affected by the disaster, anxious to see that funds are appropriated when the disaster warrants a disaster declaration. However, none of the relief agencies can or will release monies without a proper disaster declaration from either the state or federal government. Furthermore, unless it is a disaster of undeniable proportions (a Hurricane Hugo or Andrew), the government will not declare the disaster without receiving damage assessment figures, properly completed on the proper forms. As one might imagine,

after a disaster there is a lot of pressure to generate good-quality damage estimates so that the funding machine can be put into motion to assist in the recovery effort. Simply put, no one can generate mass, well-documented, appraisal-value estimates on new, old, damaged, or destroyed properties better than the local assessor. Unfortunately, in many areas of the country, damage assessment activities are relegated to other local offices.

My office has been serving as the damage assessment coordinator in our county for about six years. In the event of a natural disaster, we help determine the amount of damage to property. In doing this, we work closely with officials in the sixteen cities in our county. In Florida, the county property appraiser does all ad valorem appraisal and tax roll processing work for all city and county property. Since 1993 and before the recent wildfires, we had been activated eleven times, mostly for tornadoes, with total damages of \$58.9 million (see table 1). In the early 1990s, most of our preparations had centered on the scenario of a massive hurricane, because that seemed the most likely disaster. For instance, when all street signs are down, all buildings are wiped out, and no recognizable landmarks are on the ground, how would one begin generating numbers for purposes of damage assessment? Appraisers deal in conceptual things, like values, and as a result, I think, vivid imaginations may be required. We came up with the idea to have property lines from our maps photocopied onto aerial photos we had made of our beachfront property (forty-seven miles of it). We then fashioned a scroll that one could hold on one's lap while riding in a helicopter. Using a grease pencil, one could cross out those properties (or areas) that no longer existed. After landing, the appraiser could go into a tent, with a generator running a microfiche machine, and come up with damage assessment estimates. We call this our low-tech-no-tech damage assessment method.

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Table 1
Damage Assessment Activation Events

Date of storm	Type of storm	Area of damage	Number destroyed	Number major	Number minor	Total parcels	Total \$ of damage
3/13/93	Wind storm	Countywide				1,273	\$ 16,948,355
5/4/94	Tornado	Holly Hill	157	116		273	\$ 6,680,000
11/17/94	T. S. Gordon	Countywide		27	631	658	\$ 10,602,924
8/3/95	Hurricane Erin	Edgewater			31	31	\$ 65,052
3/11/96	Wind storm	Daytona Beach		1	7	8	\$ 28,000
10/8/96	T.S. Josephine	Countywide	1	10	182	193	\$ 1,232,343
4/23/97	Tornado	NSB Peninsula		11	68	79	\$ 525,600
7/5/97	Tornado	Oak Hill		4	2	6	\$ 33,000
11/2/97	Tornado	NSB Main & Penn	31	209	78	318	\$ 11,070,722
2/2/98	Wind storm	Bethune Beach		1		1	\$ 20,000
2/22/98	Tornado	Daytona Beach	45	267	304	616	\$ 9,435,553
6/12/98	Fire storm '98	Countywide	13	2	7	22	\$ 2,126,013
7/28/98	Tornado	Daytona Beach	1	3	42	46	\$ 159,000
Total	13		248	651	1,352	3,524	\$ 58,926,562

Even before my office was designated the damage assessment coordinator, we held the view that we were the only ones who could successfully perform damage assessments, so we prepared anyway. The "storm of the century," which blew through Florida in March 1993, provided us with an opportunity (albeit unwelcome) to put our preparations into practice. While other agencies estimated that about 100 homes were damaged, our field appraisers were telling us that the numbers were much higher. We put our teams into the field for three days, with cameras, and documented more than 800 homes with damage (contributing to a total of more than 1,000 properties with damage)! After that, everyone thought that we were the logical choice to perform the damage assessment function. We have not increased our staff or budget because of this added duty. My theory is that it's a bit like a family emergency; when it hits, you stop what you're doing, take care of business, and then get on with life.

There's a definite public relations side to this picture, as well. After several of the tornados, we sent letters to property owners who had sustained damage, informing them that we had pictures of their damage with value estimates, and that we would be glad to help them document their damage for insurance purposes. We also were asked to present a program at the Florida Governor's Hurricane Conference for the past two years on how we come up with well-documented numbers while operating under less than optimal conditions.

Fighting Fire with Maps

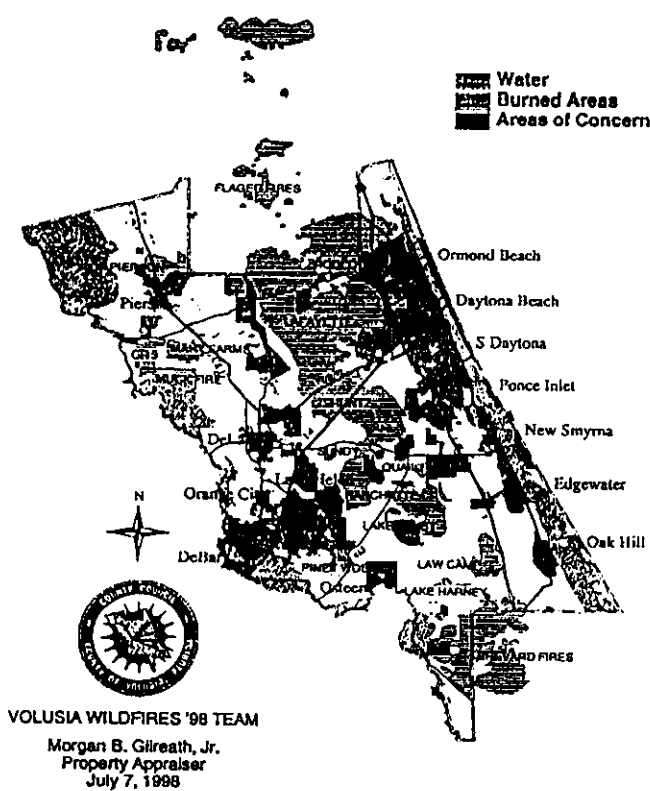
Our methods of damage assessment were used and expanded for the wildfires that hit Florida in 1998. All wildfires begin as little fires, but this past June,

when they became known as wildfires here, they were out of hand. In my county, Volusia (home of Daytona Beach), more than 200 square miles of property were burned. At one time, we had 195 miles of actual burning fire line. Figure 1 is a map showing the burned areas at the end of the wildfires. Our county has an area of a little over 1,200 square miles, with forty-seven miles of ocean as our eastern border and almost eighty miles of meandering St. John's River as our southern and western borders. In between the ocean and the St. John's River are 252,000 real estate parcels and about 400,000 people.

I am on the policy group at our emergency operations center (EOC), which decides when to declare an emergency and when to activate the EOC. When I first went to the EOC, no properties had been damaged yet and I was there to be briefed on the status of the fires. As the fire services staff reported on what was burning where, I didn't see any geographic reference (like a map). I got one of our maps, a countywide section map with roads on it, and began to sketch with a pencil the areas being described as on fire. I showed this to the fire services chief. He asked for a photocopy of the map and, a few hours later, I saw a number of fire fighters carrying around copies of that map.

Fire fighters know a lot about fighting fires and fire strategy and brush trucks and helicopter water drops and much more, but I found that they weren't too savvy about making maps. They didn't know what types of maps might be helpful and what types could be developed, given today's technology. They got savvy fast after we started churning out a few different kinds of maps and explaining how we could combine

Figure 1
Wildfires '98



our database information with the maps. We ended up making a number of different types of maps, using technology ranging from the low-tech—no-tech level to geographic information systems (GIS) maps complete with databases. Some of the more prominent types of maps were:

- County maps showing locations of the 165 different fires over the entire county (over the six weeks, they kept burning together). At first the maps were made by hand, then photocopied. After a couple of days, we brought GIS equipment out to the EOC and began making computerized maps.
- Maps showing where new fires occurred each night, using infrared flights (sites were flown over at 11 p.m., the photos picked up at 2 a.m., the photos interpreted from 2 to 6 a.m., and mapped by 7 a.m. for distribution to fire crews, bulldozer crews, scouts, and other workers). These maps were first plotted by hand on large maps (United States Geographical Survey quads taped together on four-foot by eight-foot foam sheets—six of these were needed to cover our entire county). These were

used to brief field supervisors, drivers, and others. The information on the maps then was digitized into the GIS and integrated into the GIS maps during the day. The flights were coordinated through the United States Forest Service (USFS) and reported to forest service regional offices. We met the photo interpretation team and made Mylar copies of their data every night—hot off the presses, you might say. Our county was split between two regional offices, which meant that we sometimes got our data from two forest service offices. Lake County, a county to the west of ours, got no forest service reports, and our flights covered a portion of their eastern boundary. On one occasion, we called to give them specifics from the infrared data regarding a new lightning strike, which appeared to have potential to develop into something more serious. In several instances, these maps were our only tools in bringing attention to areas with fires. Once fire was pinpointed, either bulldozer lines or brush trucks were deployed to contain the fire. This infrared technology was one of the best fire-fighting aids of the whole effort. We were glad we were able to tap into it and make it available for this important operation.

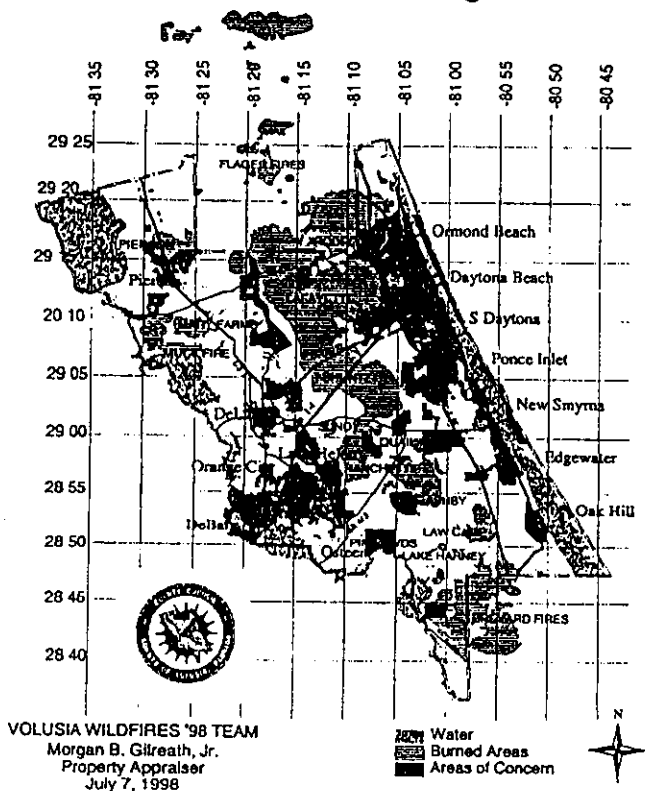
All of our maps were cumulative in nature, meaning that “new fire” information was added to them daily. We distinguished between new fire and old burned areas by color on the computerized maps.

- Two sizes of maps showing latitude and longitude grids. The small 8.5-by-11-inch maps were used by pilots for dropping water over fires from the air. The drops were coordinated from ground to air using latitude/longitude readings from global positioning systems (GPS) units on the ground. Every day, scouts on the ground with GPS units also continually reestablished the actual boundaries of the fire line. Early on, we found controllers at the airport using a hand-drawn (with a magic marker) five-minute (about five miles) latitude/longitude grid on a highway map at the airfield for calling coordinates to pilots for air drops of water on the fires. It was a good map, but it was useful only at one location. At first, we made multiple copies of that grid for fire fighters to use on the ground, and later produced a GIS version with one-minute grids of latitude/longitude points. The larger (two feet by four feet) version was good at central locations, but the 8.5-by-11-inch maps were easier to work with in the

confined space of a truck or cockpit. See figure 2 for a sample of the lap-sized version.

- Triage maps showing fire strategists where residential areas and other structures were located, so that the command group could plan where to let the fire burn and where to divert the scarce resources available to a different site. In medicine, triage refers to determining among multiple patients who is to be treated first. In fire fighting, it relates to evaluat-

**Figure 2
Wildfires '98
Five Minute Lat/Long**

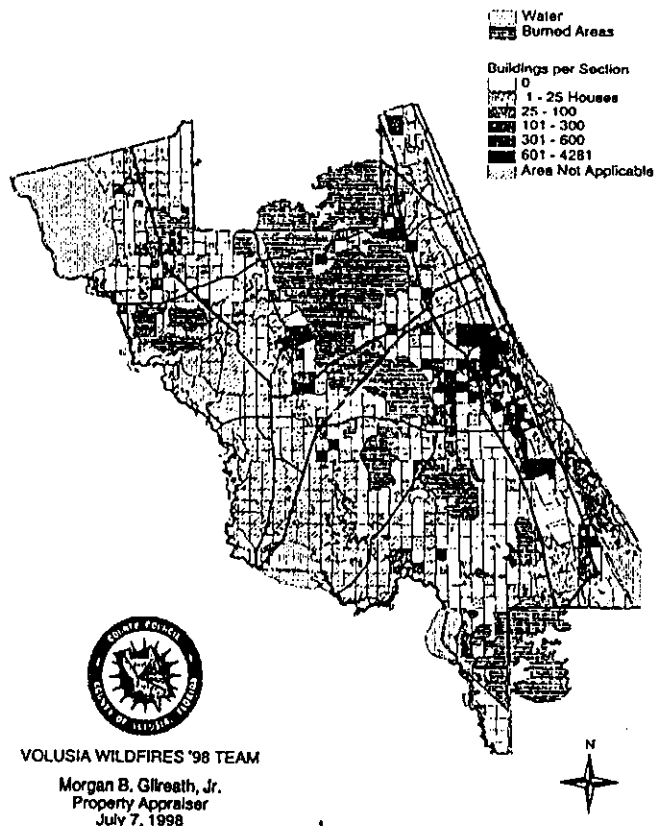


ing a neighborhood to determine which structures can be defended and which cannot, based on wall types, surrounding buildings, plants (fuels), and the like. Although we had fire fighters from forty states deployed here, numbering around 1,500 men and women, the 195 miles of fire line ensured that resources were always scarce. These maps were the first of their kind to be used here for triage purposes. We were told they were very useful in determining where to deploy critical resources when the wind suddenly shifted or areas suddenly appeared threatened. The first of

these triage maps, like the others, was done by hand from computer printouts we had prepared for estimating damage after a hurricane. These printouts contained columns with numbers of properties, with counts and values, stratified three ways (by geographic section number, by block number, and by our appraisal-designated neighborhood boundaries). These were designed to allow us to look rapidly at summaries showing the locations and worth of specific areas. Figure 3 shows our housing density map that was used for triage purposes.

- Maps generated directly from data gathered on helicopter flights where a portable GPS latitude/longitude auto generator (I really don't know the technical name) was used to map the fire line. This unit would automatically take GPS latitude/longitude points and store them in a computer file, which we could load directly into our GIS system when the helicopter crew returned. We could then generate a map in seconds. This was an incredible

**Figure 3
Wildfires '98
Housing Density (Triage)**

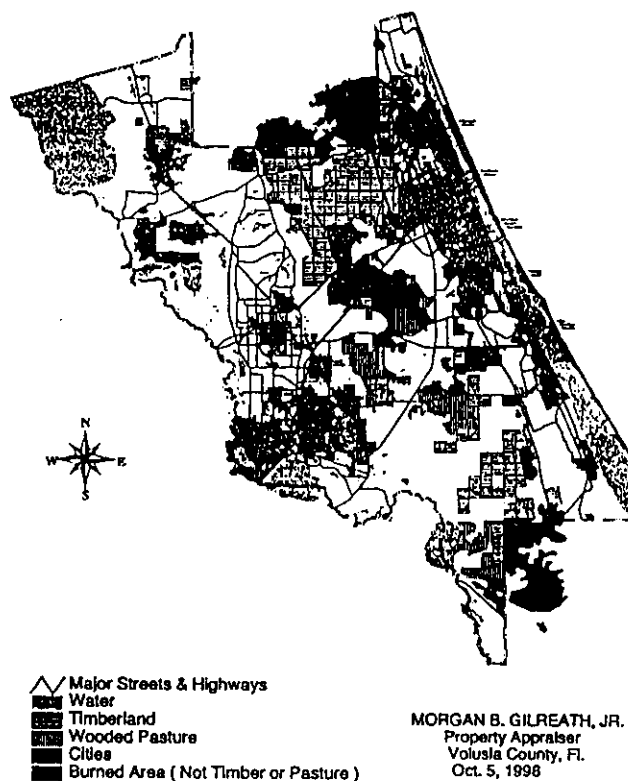


use of the technology. However, as you've probably figured out, when a wildfire is burning, from the air one can see the ground only in areas away from the direction the wind is blowing or away from the intense heat. Sometimes fire areas are designated "no-fly zones" when water is being dropped. So, this impressive technology was not very useful in terms of getting operational information back out to the field in a hurry. However, it did eventually serve to help document total area of burn for the USFS. I think this was one of the first times they have used such maps to document burn area, and I expect these maps to become a much more useful tool in the future.

- Maps developed on the spot, as the need arose. I remember getting down on the floor about 10 p.m. one night with a fire specialist from the Nature Conservancy to write street names on aerial photo prints with a 1-inch = 200-foot scale, because he was leaving immediately to triage a neighborhood where the fire was expected to arrive before dawn. He, like most of the fire fighters, was not from our area and had no idea what was where on the ground (particularly in the dark). Another time, I did a similar thing for three bulldozer drivers, who were going to put a bulldozer line through several miles of remote area (truly out in the boonies). The vegetation shown on the map at that scale helped them to anticipate the topography they would encounter. We kept copies of all our aerials in case of future need.
- Maps generated after all of the fires were out that showed how much of the burned land was timberland as opposed to wooded pasture land that was privately owned. This information is very important in the recovery effort. It can be used in the future to see where different types of fuels are located and the extent of private versus state or federal ownership. Figure 4 is an example of a map showing private ownership of land affected by the fires.

Interestingly enough, although the computerized maps looked infinitely better, they never could be finished as quickly (because they had to be digitized) as the hand-drawn maps. Sometimes it was three or four hours before the finished computerized product was available and printed out. The consequences of

Figure 4
Privately Owned Agricultural Land Affected by Wildfire



delay under these circumstances can be severe. It is my opinion that when information is so critical that lives or property depend on its timely delivery, then the more basic and simple you can keep the format of the information, the more reliable you are in getting the right people informed. Although we used the computer extensively in our mapping efforts, we never made our delivery dependent upon technology. I knew, and the fire command unit knew, that I could deliver maps to them drawn by hand with a pencil, if necessary (because that was the way we started).

We were so busy trying to find ways to get information out to the fire fighters that I never stopped to think that what we were doing was "neat" or "cool." Like everyone else, we were just using the skills we had to try to help out. So, I was amazed when ABC News showed up one day and wanted to film a segment on our mapping to air on Discovery News (shown nationally on the Discovery Channel every weekend). The segment did air, and after that we got a gigantic case of the *Big Head* and were useless for a couple of days.

Table 2
Wildfire '98
Total Damage Estimates

Volusia County Property Appraiser Morgan B. Gilreath, Jr., M.A., A.S.A., C.F.A. Total Damage Estimates For "Wildfire's '98"											
PARCEL NUMBER	STREET NUMBER	STREET NAME	MILL GROUP	PC CODE	DAMAGE VALUE	TPP DAMAGE	PRI/ SEC	TYPE	OWN/ RENT	DAMAGE LEVEL	INCOME L.M.H
MILLAGE GROUP 150 COUNTY-SOUTH WEST											
0315-01-00-0030	1530	SPANISH MOSS	150	00	\$10,000	0				DEST	
8212-01-03-0100	4114	BOY SCOUT CAMP	150	2	\$12,111	0		MH		DEST	
		HUNTING CAMP RESIDENTIAL	1		\$10,000	0					
		SUB TOTAL	1		\$12,111	0					
						\$22,111					
MILLAGE GROUP 201 ORMOND BEACH											
4238-01-40-0011		BEAR CREEK MHP	201	24	25,530			MH		MIN	
4208-01-00-0010	1240	N US 1	201	25	15,318	5,000		COMM		MIN	
4238-02-04-0160	1233	N US 1	201	41	63,825	126,754		COMM		MAJ	
4238-02-04-0140	1227	N US 1	201	41	40,848			COMM		MAJ	
4206-02-00-0001		ORMOND LAKES SUB	201	97	50,000			COMM		DEST	
		COMMERCIAL INDUSTRIAL	3		90,848	5,000					
		SUB TOTAL	2		104,673	126,754					
						327,275					
MILLAGE GROUP 600 COUNTY-SOUTH EAST											
9334-00-00-0010		MAYTOWN RD	600	1	19,000	0	PRI	SFR	OWN	DEST	
		RESIDENTIAL	1		19,000	0					
		SUB TOTAL				19,000					
MILLAGE GROUP 850 COUNTY WEST OF ORMOND											
4112-00-00-0220	684	TYMBER CREEK RD	850	1	63,686	0		SFR	OWN	DEST	
3126-00-00-0060	1701	N US 1	850	36	20,000	0		COMM,		MIN	
4136-03-03-0060	236	TREELINE TR	850	1	1,287	0	PRI	GAR	OWN	DEST	
		SINGLE FAMILY	2		64,973	0					
		COMMERCIAL	1		20,000	0					
		SUB TOTAL				84,973					
MILLAGE GROUP 900 COUNTY N OF ORMOND											
3136-01-24-0030	1155	HALIFAX RD	900	1	3,685	0	PRI	SFR	OWN	DEST	
3136-01-24-0031	1157	HALIFAX RD	900	1	9,289	0	PRI	SFR	OWN	DEST	
3136-01-22-0030	1155	HAMMOND ST	900	1	4,166	0	PRI	SFR	OWN	MIN	
4112-00-00-0021	1591	HARMONY	900	1	39,572	0	PRI	SFR	OWN	DEST	
3231-00-00-0040	1364	N US 1	900	1	6,383	0		SFR		DEST	
4112-00-00-0040	768	TYMBER CREEK	900	1	6,831	0	PRI	SFR	OWN	MIN	
4238-01-16-0020	848	HULL RD	900	25	553,465	1,000,000		COMM		DEST	
3231-00-00-0053	1361	N US 1	900	43	12,765	0		COMM		MIN	
4238-01-16-0010	1380	HARMONY AV	900	61	12,765	0		COMM		MIN	
3231-04-00-1540	7	WALNUT CT	900	1	3,931	0	PRI	GAR	OWN	DEST	
3231-04-00-1540	5	WALNUT CT	900	1	10,917	0	PRI	GAR	OWN	DEST	
		SINGLE FAMILY	8		80,894	0					
		COMMERCIAL	2		578,995	1,000,000					
		INDUSTRIAL	1		12,765	0					
		SUB TOTAL				1,672,654					
TOTAL DAMAGE					\$2,126,013						

TOTAL DAMAGE REPORT		
TYPE	#	\$ DAMAGE
SINGLE FAMILY	12	\$176,978
HUNTING CAMP	1	\$10,000
COMMERCIAL	6	\$1,894,843
INDUSTRIAL	3	\$244,192
GRAND TOTAL	22	\$2,126,013

FIRST PERSON

When the smoke cleared, literally and figuratively, only twenty-two structures had been damaged, with thirteen of these destroyed (nine residential, two commercial, and the rest miscellaneous structures). Seven of the remaining nine structures received only minor damage. (Table 2 provides details on the damage as we reported it to the EOC.) These numbers are incredibly low considering that at one time close to 20,000 single-family homes had been threatened. The primary reason we suffered such a small degree of property loss, in my opinion, is because these fires were fought from the outset by highly qualified fire-fighting strategists who used every technique and planning aid they could find while being innovative when necessary.

No one from the forest service or state or local fire services had ever encountered a wildfire of such magnitude with so little property loss. All of these organizations gave us pats on the back for the maps, but they (the fire fighters and bulldozer drivers) were the ones who were on the line out there. We were just

a small cog on a big wheel, where everyone rolled well together over the course of the fire-fighting effort.

The Lesson to be Learned

For the past couple of years, I have attempted to bring local and national attention to our assessment industry, pointing out to anyone who would listen that we in the ad valorem appraisal business are, now and in the future, also very much in the information business. During the fires, we simply tried to use the information available to us to help other people. The databases maintained by all assessors, anywhere in the country, in my opinion, are the most comprehensive and coveted databases existing at any level of government. If we don't become efficient managers and disseminators of this data, who will? We are, if we want to be, *the information brokers for the twenty-first century*—which happens to be the title of my article in the March/April 1998 *Assessment Journal*. As I stated there, often we are limited only by our own perceptions of ourselves.

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