

FALL 2003

Mapshots in Time: New Web Site Captures a Changing Midwest

EDITOR'S NOTE:

At NC, our scientists are experimenting with new media approaches to share their results with one person or a million. It's life beyond the scientific journal. We'd like to tell you about two of these latest efforts—the Changing Midwest Landscape map series and the Oak Wilt CD—in hopes that you'll surf over to our Web site and check them out.

"Creeping normalcy" is when things change too slowly to notice. If we had a way to map change, it would help all of us—citizens, land managers, elected officials—take action while trends are still benign. That's the idea behind NC's Landscape Change Integrated Research Program.

For the past 3 years, our Landscape Ecology Research unit in Rhinelander, Wisconsin, has partnered with other scientists from NC and the Universities of Michigan and Wisconsin to acquire, sort, compile, and map terabits of regional data. These data come from a multitude of agencies that take the pulse of our region (e.g., Forest Service, National Oceanic and Atmospheric Administration, U.S. Geological Survey, Department of Energy, Department of Commerce, and State fish and wildlife agencies).

Luckily, you don't have to speak multiple data languages to see how the region is changing. Maps on the Changing Midwest Landscape Web page depict changes in human population, housing density, forest cover types, relative abundance of birds, oak

decline, and more. For each category, you can see how the region looked in 1980 and 2000, while a third map depicts percentage of change over those 20 years. Very intuitively, you can grasp *patterns* of change and see *where* in the landscape those changes are occurring.

What's Changed Where?

These "mapshots in time" tie information to territory (down to 1 square kilometer). It's fun to pick a county and follow its story—see whether it has gained or lost population, how deer harvests are trending, or how many seasonal houses have sprung up.

Regionwide, here's a glimpse of what happened between 1980 and 2000:

- Human population: 10 percent increase
- Total housing density: 22 percent increase
- Seasonal housing density: 225 percent increase

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- Urban land cover: 1.5 million acre increase
- Forest area: 7 percent increase
- Maple/Beech/Birch forests: dramatic increase
- Aspen/Birch and Spruce/Fir forests: significant decrease
- Dominant stand-size class of trees: changed from medium to large-diameter
- White-tailed deer harvest: 250 percent increase
- Breeding birds: significant decreases in 25 percent of species.

*If you want to avoid “creeping normalcy,” head over to the new **Changing Midwest Landscape Web site** for a close-up view of our region in action. That’s just what 60,000 visitors did at the recent opening day of this new, map-centric site.*

Dialing for Data

How did the team decide which data to display? “We began by asking dozens of land managers and researchers what type of information they’d been tracking for the last 20 years,” said Rob Potts, research ecologist and lead scientist in the effort. Behind each map are millions of data points collected by satellite or logged in by people in the field.

Standardizing this data was no easy trick. “We took apples and oranges and made them into peaches,” says Potts. He describes, for instance, how data from improved USGS satellites became incompatible with older data. The team resolved the differences by using a

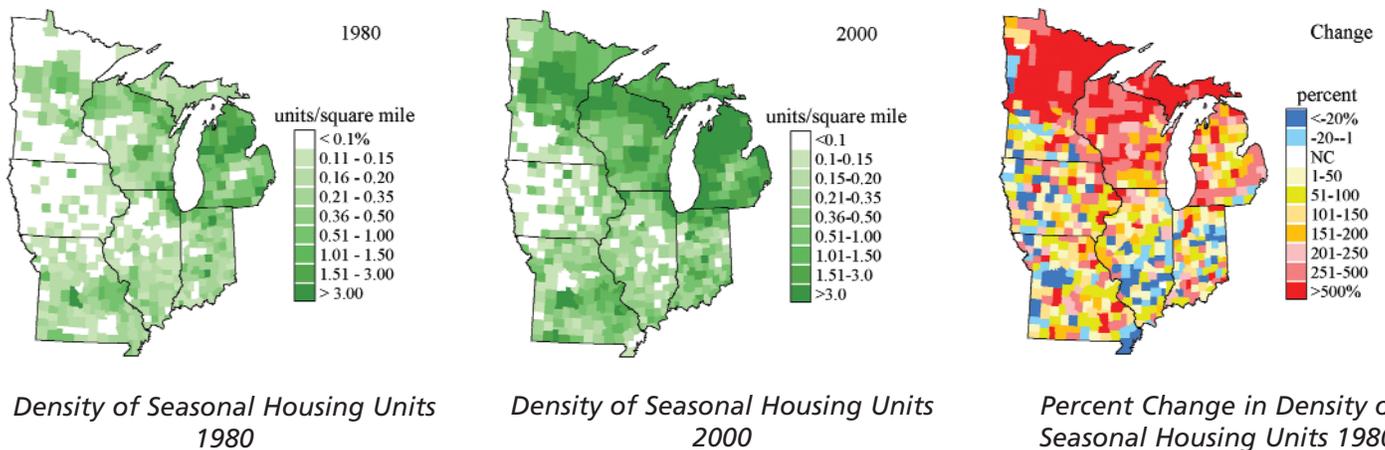
third, non-changing data set as a translation bridge. Crossover tables also were developed for Forest Inventory and Analysis data, said Potts, to reconcile data collected annually with those collected in multi-year cycles. Data from breeding bird surveys, conducted along linear roadways, had to be collapsed into mapable points using a mathematical technique called kriging.

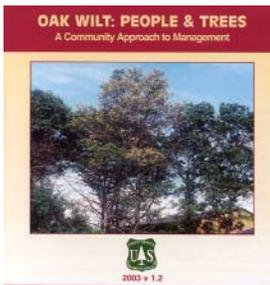
“Innovations like these are what make this research exportable,” says Potts. “Now that we’ve shown how to standardize the data, other teams can map their own regions.”

Maps that Morph

Meanwhile, the landscape change team is back at it, finding patterns and rules in the change data that can be expressed as models. Some of these predictive tools will allow people to ask “what if” questions, simulating the future to avoid costly mistakes.

A new software program is now being loaded that will allow you to zoom in on a pixel, display detailed data, and animate the maps so that they morph through the years. That’s something you can’t do with a scientific paper. So, bookmark us at <http://www.ncrs.fs.fed.us/4153/deltawest/> and keep your eye on change. 🌿





Pop this CD in your laptop, and you'll have all the information you need to manage oak wilt. Plug into a projector, and you can teach others to do the same.

"When you are talking about saving some of the Nation's most beloved trees", Jennifer Juzwik says, "you want prevention information to spread faster and farther than the infection itself."

Oak Wilt CD Puts Expert Seminars in Your Laptop

Oak Wilt is a fungal infection that kills red oaks swiftly and white oaks more slowly. It kills thousands of trees every year, including highly prized shade trees in Eastern and Midwestern neighborhoods.

In an effort to combat its spread, Jennifer Juzwik, a research plant pathologist and project leader for North Central's Forest Diseases unit, led a team in the development of a multimedia CD entitled "Oak Wilt: People and Trees—A Community Approach to Management." Released in July, the CD uses Microsoft PowerPoint™ presentations, videos, and PDF documents to outline prevention and treatment strategies that can halt the spread of oak wilt in a variety of settings, from backyard trees to urban forests and beyond.

The CD's target audience includes urban and community foresters, city administrators, tree inspectors, parks and regulation staff, and anyone else interested in an integrated oak wilt management program.

A Slide Show to Go

The core of the project is three PowerPoint presentations. One is broken up into five sections: a description of the disease; a guide to identifying it; an explanation of how it spreads; an overview of management techniques; and an almanac that describes how to break up tasks during the year (spring and early summer are the time for surveys and fungicide treatment, while fall is a good time to use the deep plows to sever fungus-transmitting root grafts that form between neighboring trees).

Another presentation reviews a variety of oak diseases that look similar to oak wilt, while the third illustrates management challenges and intervention strategies, such as different ways to sever root grafts.

The presentations illustrate key points with 30- to 60-second videos, and even a whimsical song called "The Oak Wilt Blues." Suitable for all audiences, the presentations are jargon-free, and the whole CD is brief enough to be viewed in less than an hour.

Searchable Technical Reports

For those who want more in-depth information, the CD also includes a number of PDFs that go into much greater detail. One, "How to Identify, Prevent, and Control Oak Wilt," describes and illustrates the disease cycle, symptoms, distribution, and management techniques. Another is a guide to identifying the sap beetles that spread oak wilt. Others include instructions for collecting field samples for testing and a guide for homebuilders working on wooded lots (important because trees wounded by construction are particularly susceptible to infection).

Also included on the CD are public domain versions of viewing software.

Juzwik initially considered publishing the information in the PowerPoint presentations in the electronic journal *Plant Health Progress*, but "I knew that the community folks I was trying to reach did not subscribe to it," she says. She settled on a CD because it was inexpensive to print and mail and would be relatively simple to update.

In a CD form, it's also more portable than a Web site, easily carried along in a laptop for use in a presentation, for example. "All of the resources are then 'at the fingertips' of the user," says Juzwik. For Juzwik, the months of preparation and review on the CD project were well worth it. "When you are talking about saving some of the Nation's most beloved trees," she says, "you want prevention information to spread faster and farther than the infection itself." 🌳



Dave Shriner

Remembering Dave Shriner

After a valiant struggle against cancer, Assistant Director David Shriner passed away at his family home in Kingston, Tennessee, July 25, 2003, leaving behind a sad NC workforce.

Excerpts of a tribute to him are below, to give you a feel for the kind of innovator, science champion, mentor, and gentleman he was.

Dave Shriner joined the Station in 1998, a very transitional time when the Station was re-evaluating historic programs and repositioning itself to meet the challenges and opportunities of the 21st century. With a kind and steady hand and a gift for seeing the possibilities, he helped lift the Station to new heights.

Dave brought with him his research expertise in plant pathology, climate change, air pollution, and environmental monitoring and assessment; his love of forests and forestry; his passion for the scientific process; and his vision for translating science findings into foundations for management and policy. His scientific and leadership skills, honed through his work at the Oak Ridge National Laboratory, the Environmental Protection Agency, the White House's Office of Science and Technology Policy, and numerous scientific advisory committees, were just what the Station needed.

Dave's gift for seeing the big picture and the possibilities, combined with his pragmatism, enabled him to quickly take hold of the "what" uncovered by site-specific process science and translate it into the "so what" implications. Dave's desk sported a sign saying "Money seeks good ideas," and he demonstrated the truth of that statement repeatedly.

Dave had a tendency to talk slowly, a trait some attributed to his years in the South. But rather than a regional dialect, Dave's precision of thought and word was a tribute to his years as an effective manager of science and people. He took the time to pick his words carefully, knowing that the right or wrong words can make or break a deal, a point, or a person.

Dave was a builder. He knew that it took teamwork to build a strong research program. He accomplished that with a quiet word here and there encouraging Station scientists to set aside small differences and learn how to work with each other. He expected good science, and with his personal scientific accomplishments granting credibility, he had a way of helping people do good research.

As Assistant Director, Dave managed the Station's research programs in atmospheric science, landscape ecology, global climate change, short-rotation woody crops, silviculture, and forest inventory and monitoring. He also led the Station's focused research addressing landscape change and forest productivity issues in the Midwest. Dave championed the application of GIS and Internet technology in making science results available and relevant to decisionmakers.

Dave was also a leader in national efforts to report accomplishments of Forest Service Research and Development under the National Fire Plan. He recognized the Forest Service's experimental forest network as a unique asset and championed its role in research and development. He was just beginning to work on identifying national criteria for natural resource research investments.

Dave had a lot more that he wanted to do. We won't ever know how far he could have taken us, but we are truly grateful for the time we had together.

**Contributed by Don Riemenschneider,
Frank Thompson, and Dennis May**



"None of us ever wanted to disappoint Dave. You worked for him because he had a way of making you want to work for him. That's not an administrator or a boss or a supervisor, that's a leader and a teacher and a mentor."

“A Day in the Life of a Marten”

Researcher Wins Early Career Award

Zollner's collaborative spirit is “courageous,” says co-investigator Jonathan Gilbert: “Some researchers keep their ideas close to their chest, but Pat makes open collaboration a part of the way he does science.”

Pat Zollner, research ecologist with the Landscape Ecology unit in Rhinelander, Wisconsin, wants to share his Forest Service Early Career Scientist Award with collaborators at NC and the Great Lakes Indian Fish & Wildlife Commission (GLIFWC), a group of Ojibwe Indian tribes. “While this is an individual award,” says Pat Zollner, “the research on American marten has been the product of great team synergy.”

The core team consists of NC's Pat Zollner and John Wright, and GLIFWC's Jonathan Gilbert and Ron Parisien. Other collaborators include Adam Green from the University of Wisconsin-Madison and Steve Mech from Albright College in Reading, Pennsylvania. Their objective is to understand why the American marten, a carnivore in the weasel family extirpated from Wisconsin in the early 1900s, has failed to thrive since its reintroduction in the 1970s and 1980s. “The fisher, a larger relative, was reintroduced here in the 1950s and has done very well, but the American marten is still endangered,” said Zollner. Known as “Waabizheshi,” a clan animal of the Ojibwe people, the marten is a key indicator species for mature, closed-canopy forests.

The team is in year 2 of a 3-year study looking at energy use, energy (prey) availability, predation pressure, and movement patterns across the landscape. Their study area includes six different habitat types on the Great Divide District of the Chequamegon-Nicolet National Forest.

A Sinuous Path to Survival

“To track energetics, we injected trapped martens with water harmlessly marked with extra electrons (O18),” Zollner said. As the animal burns energy, the O18 moves to carbon dioxide in the blood. The amount of O18 in the bloodstream of recaptured martens points to energy use. “We assumed martens would use more energy keeping warm in winter, but our O18 water experiments showed martens use less energy in winter than fall,” he said. “This was a bit mysterious until we examined our radio telemetry data, which showed martens resting for longer periods in the winter and foraging in short infrequent bouts to conserve energy.”

Avoiding predators may not be as easy as avoiding the cold. Clues to the marten's high mortality in the study area may be found in the team's small mammal survey, which looked not at predators, but at prey. As Jon Gilbert explained, “It's all interrelated. In open areas with little cover, prey may be scarce and martens have to forage longer distances to get food. That opens them to heavy predation by fishers and owls.” Learning which habitats decrease predation and increase marten success may help forest managers plan for the needs of this important species.

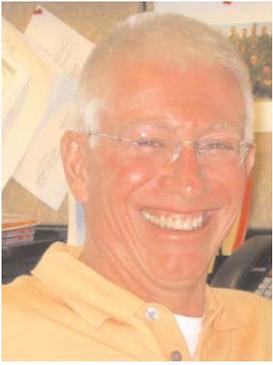
Future Studies

This winter, the team will track the movements of radio-collared martens. “The more we understand how animals actually use landscapes, the better our predictive models of animal dispersion will be,” said Zollner.

Zollner hopes to apply this research approach to future studies on lynx. Jon Gilbert expects that study to be just as fruitful: “What makes Pat special is how thoughtful and curious he is. He spends time thinking before acting, and that's why his whole program of research is worthy of this prestigious award.” According to Zollner, the real reward is “working with such insightful colleagues.” 🌲

Pine marten drawing by Gaby Sinsich <http://gsstudio.tripod.com/ho me.htm>





Rob Doudrick

A Change of Leadership at North Central

We have the good fortune of having not one, but two new Assistant Directors bring their fresh ideas and energy to our management team. Robert Doudrick and James Gooder will oversee the Station's research work units and, with the rest of North Central's Executive Team, establish Station direction and program, including budget.

Rob Doudrick

Dr. Rob Doudrick brings rich experience and some midwestern roots to North Central. He comes to us from the Washington Office, where he served as Budget Coordinator for Forest Service Research and Development. Before that, Rob was a Brookings Institute Fellow on the staff of Rep. Charles Taylor of North Carolina. (Rep. Taylor is Chairman of the House Interior and Related Agencies Appropriations Subcommittee.)

Before moving to Washington, Rob was Planning and Applications AD and head of the Southern Institute of Forest Genetics at the Southern Research Station. As head of the Institute, he managed the Harrison Experimental Forest in Mississippi and led Station efforts to increase outreach to under-served customers. He is an adjunct professor of forest science at Texas A&M and continues his distinguished publishing career, which includes important works on conifer rusts, the inheritance of molecular markers in pines, and comparative genome analysis. He is a past board member of the American Chestnut Foundation and a member of Sigma Xi and the American Genetics Society. For his work on American chestnut, he received a Secretary's Honor Award for Research.

Rob received his doctorate in forest resources from the University of Minnesota and his master's and bachelor's degrees in his home State at the University of Missouri-Columbia. 🌲

James Gooder

James Gooder comes to us from the National Forests in Alabama, where he was Forest Supervisor for the past 4 years. With over 30 years of Forest Service experience, Jim brings a wealth of organizational skills, working relationships, and experience in building congressional relations.

He started his career in Research as a Forestry Aid at the Research Work Unit in Nacogdoches, Texas. He has worked at all levels of the Agency including the then Southern Station headquarters in New Orleans; the Chief's Office; the Pacific Northwest Regional Office in Portland, Oregon; and six national forests.

Under Gooder's leadership, the National Forests in Alabama produced a draft Revised Land and Resource Management Plan and Environmental Impact Statement while embarking on a broad landscape-level analysis of forest health. A strong prescribed fire program and innovative wildlife habitat improvement program was also started on his watch.

Jim earned a Bachelor of Arts degree in political science and business administration from the University of New Orleans. He has received numerous awards including the U.S. Secretary of Agriculture award for Program Leadership. 🌲



James Gooder



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