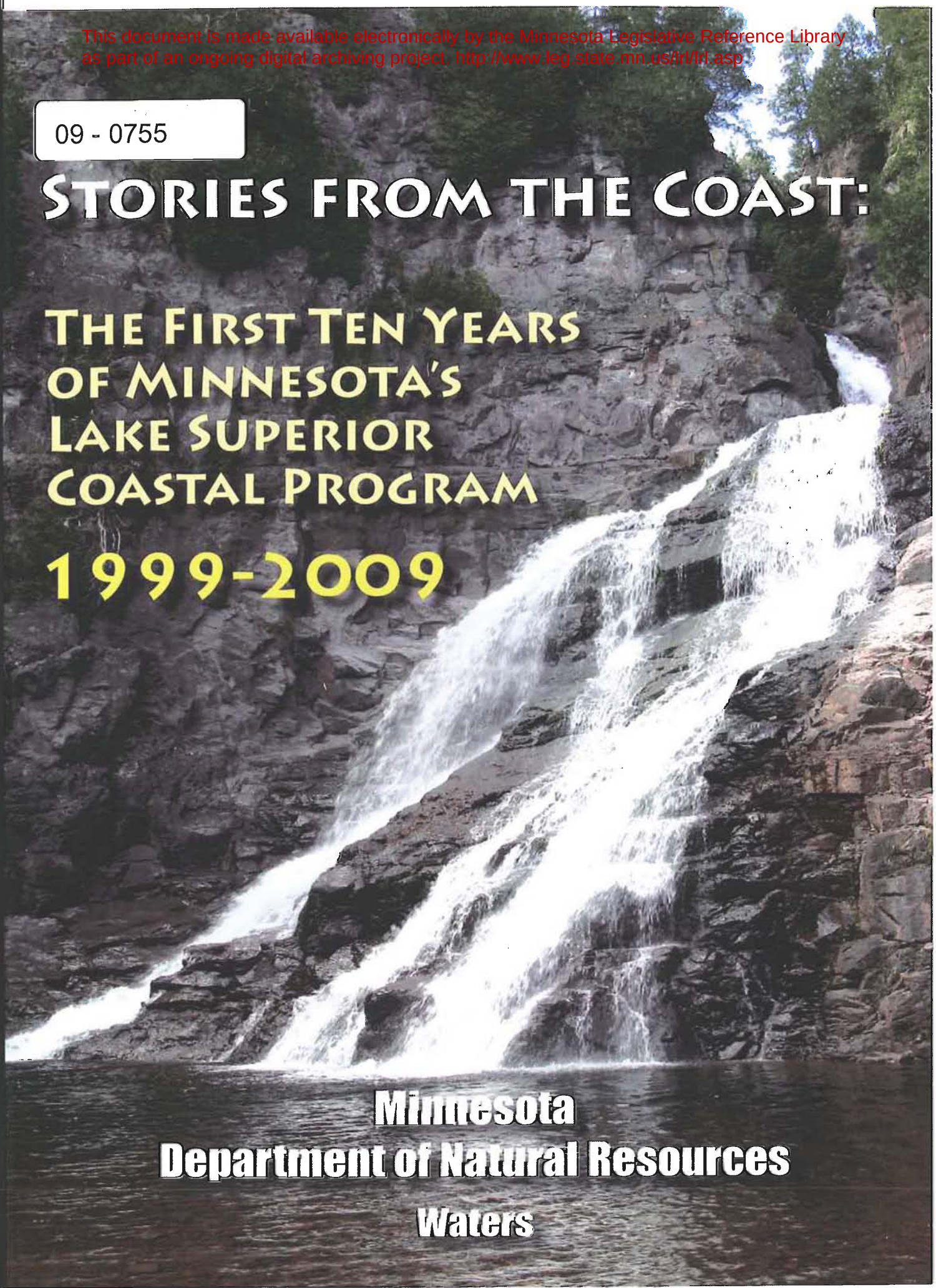
Stories from the Coast:

The First Ten Years of Minnesota's Lake Superior Coastal Program

1999-2009



Minnesota Department of Natural Resources

Waters

Our mission is to preserve, protect, develop and where possible restore, and enhance coastal resources for current and future generations

Minnesota's Lake Superior Coastal Program
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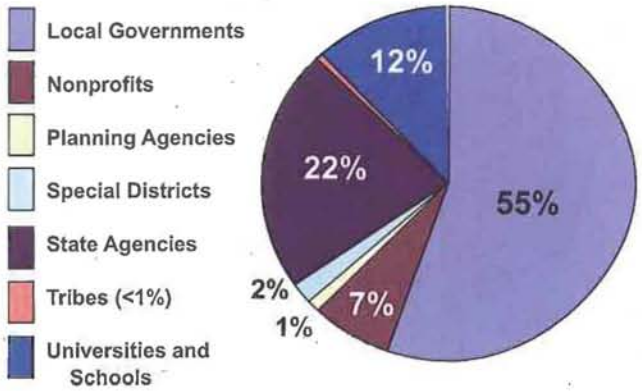
FORWARD

In July of 1999, Governor Jesse Ventura, along with the Commissioner of the Department of Natural Resources, and officials from the National Oceanic and Atmospheric Administration (NOAA) signed the Certificate of Approval establishing Minnesota's Lake Superior Coastal Program (MLSCP).

Since that date ten years ago, Minnesota's Coastal Program has received $12.2 million in federal grant money through the Coastal Zone Management Act. We are preparing to start projects in our 11th annual grant cycle and will be announcing the request for proposals for the 12th year soon. More than 80 different units of government and local organizations have received funding for projects ranging in cost from $453 to $445,492. More than half of that funding has gone to cities, townships and counties to fund projects they have identified as their top priorities (see Figure 1).

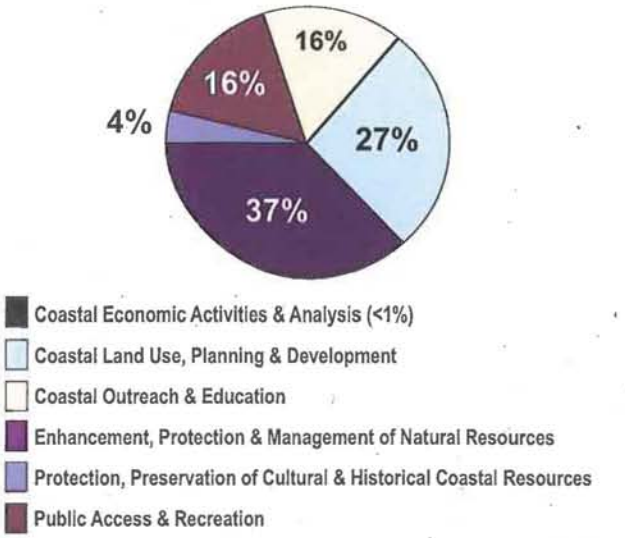
Figure 1: Who Received Funds?



Minnesota came late to the national coastal management community. Our program development took 25 years and was marked with significant challenges and, at times, stiff opposition. The Coastal Program eventually crafted for our North Shore acknowledges the important role of local leadership and local citizen involvement in managing the Program. Members of the Governor's Council on Minnesota's Coastal Program, also known as the "Coastal Council" are crucial to the acceptance of the Program and the success of our grant program. They remain dedicated to the health of Lake Superior, its tributaries, watershed, and coastal communities. They continue to give generously of their time and talent as they serve on the Coastal Council.

A key factor in the program's success is its ability to fund a variety of projects in a variety of areas. Construction, acquisition, restoration and engineering projects are eligible for funding along with those focusing on administration, planning, research and education and interpretation. Figure 2 illustrates the types of projects funded in our first ten years.

Figure 2: Types of Projects



Since the Program's inception, MLSCP has been evaluated twice by external teams of reviewers that included members from NOAA and other state coastal management programs. In each case, the reviewers were impressed by the effectiveness of MLSCP and the quality of Minnesota's coast. We credit much of our success to the commitment and dedication of the partners we work with on a regular basis. Lists of projects and graphs of money spent are not adequate to illustrate the impact of the program over its history. Activity does not equal impact. This ten-year retrospective is intended to share with you some of the real life impacts of that work through stories from the coast.

Looking ahead to the next ten years we anticipate changes and challenges but expect to continue in our efforts to provide technical and financial assistance to the people and organizations dedicated to preserving, protecting, developing, restoring, and enhancing coastal resources for current and future generations.

Pat Collins
Program Manager
Minnesota's Lake Superior Coastal Program
Minnesota Department of Natural Resources

MINNESOTA'S NORTH COAST

For 10 years, Minnesota's Lake Superior Coastal Program has been helping the North Shore care for its coastal resources in ways big and small.

• From enabling the Tofte-Schroeder Sanitary Sewer District to secure the funds to fix its failing septic systems to educating restaurant workers not to dump grease down their kitchen sinks and into Duluth's sanitary sewers.

• From helping Grand Marais build stormwater retention ponds to exposing individual homeowners throughout the watershed to the benefits of rain barrels and rain gardens.

• From acquiring more than 1,200 acres of land for public access to the lake and its natural areas inland to providing safe trails for Two Harbors students to walk or ride their bikes to school.

The Coastal Zone Management Act allows us to create this partnership between the National Oceanic and Atmospheric Administration, the Minnesota Department of Natural Resources and local communities to manage resources on the North Shore, explains Pat Collins, Coastal Program manager.

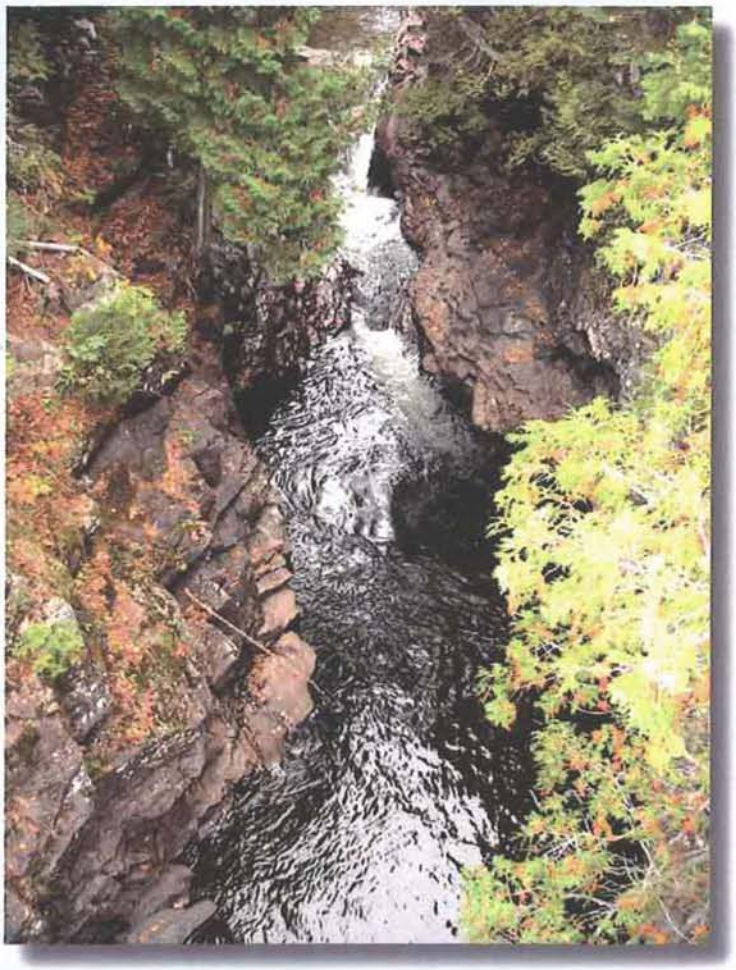
It accomplishes much of its work through others, providing federal matching grants and technical assistance to 31 local units of government, their boards, commissions and authorities, state and regional agencies, educational institutions, nonprofit organizations, – just about any eligible group with a project that furthers the Coastal Program's mission.

That mission, identified by the Coastal Zone Management Act, is to preserve, protect, develop, restore and enhance coastal resources for present and future generations.

In its first 10 years, the Coastal Program has brought more than $12.2 million in federal funding to the area. Nearly $9 million of that has been awarded in grants for more than 350 projects along Minnesota's Lake Superior coast and in the watershed.

Recent projects include replacing bridges on the Superior Hiking Trail, building a new park on Grand Marais' harbor, installing a green roof on St. Louis County's motor pool garage, preparing the nomination of two shipwrecks to the National Historic Registry and using GIS mapping to help Duluth Township update its land use plan and develop a new zoning ordinance.

"When I talk to the average person…they don't really get it, that we are getting federal funds just because we have a shoreline," says Stacy Radosevich, a founding member of the Coastal Program's Coastal Council. "It's a pretty incredible thing to have this money coming into our community."



Lake Superior is the world's largest freshwater lake by surface area, covering 31,700 square miles. It's the world's third-largest freshwater lake by volume, containing 3 quadrillion gallons of water, or 10 percent of the world's fresh surface water.

"It's a big force of nature, both awe-inspiring in terms of its size and its weather. It gives you a sense that you – as humans – aren't as a big a force as you think you are," says Jan Green, who has been involved in a number of Coastal Program funded projects.

The big lake provides a direct waterway link to the world from the middle of North America. The port of Duluth-Superior is the largest on the Great Lakes, shipping about 45 million metric tons of cargo annually.

The lake supplies drinking water to those who live near it. Residents and visitors alike flock to the lake to watch it in all kinds of weather.

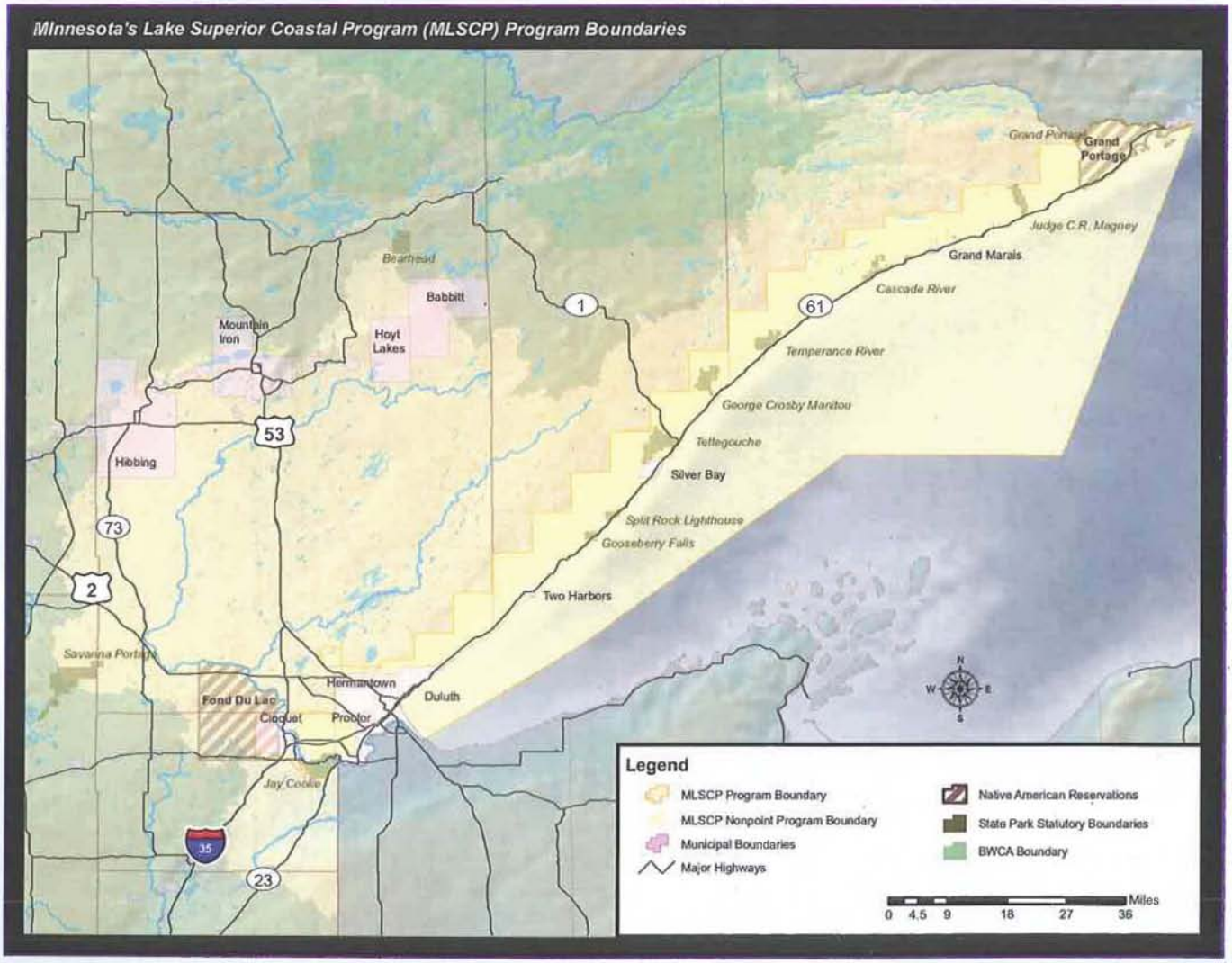
"It's so definitional for all the people who live on it or by it," says Jesse Schomberg of Minnesota Sea Grant. "It defines our economy... It affects our weather... It's a part of the daily life."

Minnesota's coast extends 190 miles along Lake Superior from the St. Louis River in Duluth to the Pigeon River near Grand Portage. The shoreline is rugged, marked by rock outcroppings, dramatic rivers and spectacular waterfalls.

The Coastal Program's service area extends about six miles inland from the shoreline and up the St. Louis River to Cloquet. It includes the cities of Wrenshall, Carlton, Scanlon, Thomson, Proctor, Hermantown, Duluth, Two Harbors, Silver Bay, Beaver Bay and Grand Marais. Some of its work also takes place in the larger Lake Superior watershed, which covers significant portions of Carlton, Cook, Lake and St. Louis counties.

It is home to about 150,000 people and contains about 742,000 acres of land.

More than 80 percent of pre-settlement wetlands in the Lake Superior watershed remain. The northeastern portion of



Minnesota is the most heavily forested in the state. The area contains 290 designated trout streams and protected tributaries, according to lakesuperiorstreams.org, and eight state parks, including some with the highest use rates in the state park system.

Much of the economy – shipping, timber and tourism...revolves around these resources.

People from other areas of the state and country consider the North Shore's natural places pristine, its wildlife abundant.

Collins cringes when he hears the word pristine. "It's easer to get people interested in restoring something that's messed up, rather than protecting something that's seen as pristine," the Coastal Program manager says.

"Pro-active is hard," agrees Brian Fredrickson of the Minnesota Pollution Control Agency. It takes the fish kills, the rivers on fire to get people's attention, he says. Then it's too late.

In reality, the area isn't pristine Collin says. It's been altered in many ways: Plant communities have changed due to invasive species and more than 100 years of logging. Development has fragmented forests. Wildlife populations are different. Fishing, invasive species and stocking have changed fish communities. Increased stormwater runoff from impervious surfaces is causing erosion and affecting water quality.

"It's true that we have good examples of large-scale functioning ecosystems, but it is just as true to say that the impacts of development have led to some pretty serious problems too," Collins says.

For 10 years, Minnesota's Lake Superior Coastal Program has been helping the North Shore care for its coastal resources. It has brought $12.2 million in federal funding to the watershed, nearly $9 million of which has been awarded in grants for projects such as developing a harbor-front park, replacing hiking trail bridges, nominating shipwrecks to the National Historic Register, collecting GIS data about the communities in its service area, and installing a green roof on a building in downtown Duluth. Minnesota's 190-mile coastline and its natural areas inland face great pressure from climate change and development. Even though seen as pristine, there's a lot of care that needs to be tendered so that the area's ecological and socio-economic systems are sustained.

SIGNIFICANT PRESSURES

Climate change and development are the two biggest pressures facing the lake and watershed, according to Schomberg. From his Sea Grant office at the University of Minnesota Duluth, he details some of the trends and concerns about climate change:

- Water temperatures are increasing in Lake Superior and its tributaries. What will that mean for specific fish populations and other creatures living there?
- The lake is experiencing less ice cover, which could mean rapid increases in evaporation. Predictions are for fewer but larger storms, likely with more runoff. How quickly will water levels change? Will they go lower and stay low, or will they fluctuate? If so, maybe we should be building our infrastructure differently.

"Knowing specifics, so you can plan, is great. Not knowing is difficult," Schomberg says of the uncertain future of our climate. "There are a lot of questions right now we can't answer real well."

Communities are making decisions on infrastructure for the

next 50 years, based on information that's the average from the past. But communities, like Grand Marais, have had two or three 100-year storms in the past eight years. "We don't have that data redone, even to plan for today's climate," Schomberg says.

"We're building stormwater infrastructure based on a climate that doesn't exist anymore," Collins says. "When we're having these larger storms, it's an infrastructure that's inadequate."

Development has a great impact on stream temperatures, Schomberg says, noting that Tischer Creek in Duluth experiences 12-degree temperature jumps after a rain, due to runoff from parking lots. Development reduces the forest canopy and the shade protecting the stream. It also reduces groundwater retention, which in turn causes greater volumes of runoff.

A lot of times when people think about stormwater runoff, they think about nasty stuff in the water." Schomberg says. "Yes, you clean up pet waste, don't use herbicides, don't dump your oil."

"But those aren't the biggest issues anymore – it's the volume of water that's running off."

With increased volumes, the streams start to rip themselves apart, causing erosion, pushing sediments into Lake Superior, smothering habitat, and carrying things with it. And with wider channels and more sunlight, streams are shallower. Fish need to find a new place to live, Schomberg's voice trails off.

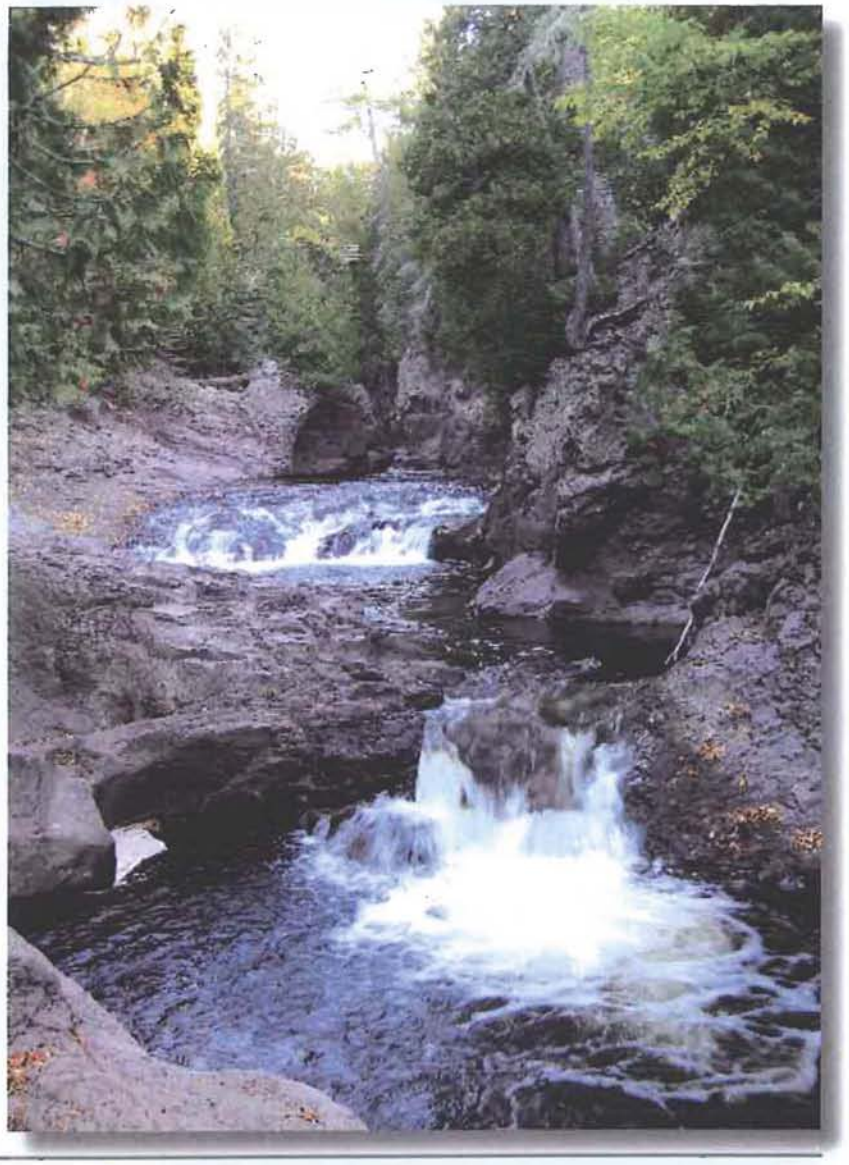
"People aren't making decisions that are bad for Lake Superior because they want to be bad to Lake Superior," Schomberg says. "They might not see the consequences, understand the consequences or simply know any other way to get something done."

When Erin Monroe was in the fourth grade, she received her first set of Duluth Stream Cards – Bugs Edition. A Coastal Program grant of $5,725 funded two editions of the cards that the City of Duluth distributed to students so they could learn about Duluth's streams. That summer and next, with a second set of cards, Erin, her mother Cindy and brother, Sean, explored Duluth's myriad creeks and rivers.

They checked on the condition of Miller Creek, a trout stream that has undergone tremendous stress from commercial development, at points behind the mall and near Lake Superior College. That was before the Costal Program helped install a sediment trap to collect sand behind the mall.

Near the mall, the water was sludgy and contained a lot of algae. They couldn't see bottom, her mother recalled. By the college, it was clean and clear.

They know more about Duluth, especially these creeks and the lake, and why we have to be careful about what runs into it, Cindy Monroe said, reflecting on their outings. "That means a whole lot more when you see an unhealthy creek rather than a healthy one."



DETERMINING THE BALANCE

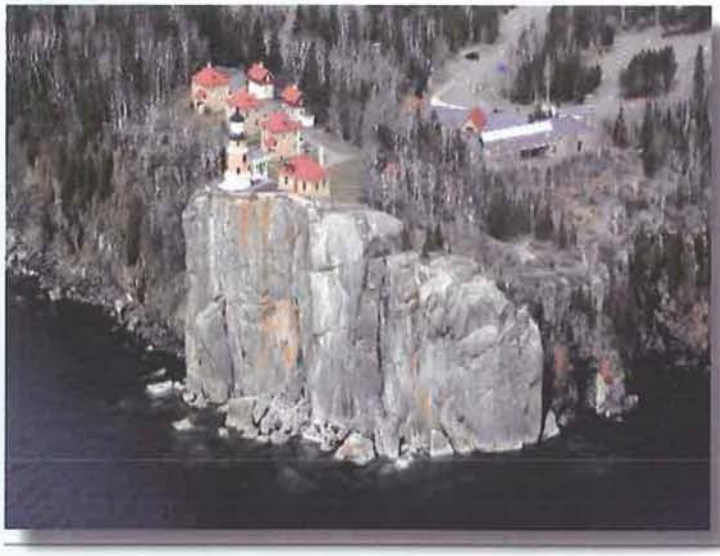
Collins is careful to point out that it isn't development, but the impacts of development that the Coastal Program is trying to address.

"What we're trying to do is to protect the ecosystem services and the communities' social-economic systems," Collins says. The distinction is about sustaining those resources that allow us to live here, rather than preserving something by keeping people out, he explains.

"The important work we're doing is helping these local communities care for the resources," Collins says. "We're doing it in a multitude of ways."

Among them:
- "Increasing capacity" through the use of GIS and other tools for community decision makers to do their work.
- Helping people who live in these communities understand what their choices mean and to make better choices.
- Giving individual communities the dollars to create projects that make a difference.

Over the 10 years, the Coastal Program has awarded $8,959,776 in grants for 351 projects in the following focus areas:
- Coastal outreach and education
- Coastal land use, planning and development
- Public access and recreation
- Enhancement, protection and management of natural resources
- Protection, preservation of cultural and historic coastal resources
- Support of coastal economic activities and analysis



Administrated by the DNR, the Coastal Program announces the new grant application cycle in the summer and holds grant-writing workshops each fall. Grant applications are due in December and reviewed in January and February. The Governor's Council on Minnesota's Coastal Program, a 15-member citizen advisory council, makes its final recommendations in March and forwards the recommendations to the DNR. The Coastal Program then submits them to NOAA for approval. Projects usually begin in July.

"Coastal Program keeps an eye on the big picture: Lake Superior and its North Shore"

Al Katz, a founding member of the Coastal Council, cites a couple of key bylaws crafted when the Coastal Program was established in 1999.

"We said we would consider every grant on its own merits," he said. And every council member would consider Lake Superior, not the geographic area they represented, as its constituency, Katz said.

Molly Hoffman of Harbor Friends was surprised when her nonprofit was awarded its first Coastal Program grant of $4,969 to publish and distribute a field guide on birds in Grand Marais' 100-acre outdoor classroom, an area of boreal forest, wetlands and shoreline.

"We were in the middle of this huge battle," she said. The advocacy group had formed a year earlier to fight a marina and safe harbor the DNR had proposed to build in Grand Marais. But it soon added an educational component to its mission. "We had some concerns, some mixed feelings," Collins recalled.

But after candid discussion with Harbor Friends, the Coastal Program became convinced of the value in the group's work to develop the guide book and its outdoor classroom program.

"If you don't get people to really care about something, they're not going to become a steward," Hoffman said.

Harbor Friends since has received $89,083 in grants to publish other field guides, youth activity books and coloring books, develop guided tours of the outdoor classroom, and create a learning trunk.

"It's our job to look at the big picture," Collins says.

Brian Fredrickson watches taconite being loaded onto a ship in Two Harbors. The Minnesota Pollution Control Agency official is collecting data on the amount of spilled cargo for an Environmental Impact Statement.

For years, the U.S. Coast Guard has allowed ships to sweep debris and rinse down their holds into the lake. But because of a federal consistency rule in the Coastal Zone Management Act, the MPCA has a tool to encourage the Coast Guard to tighten up its dry cargo residue rules.

"Federal consistency, from our point of view, is one of the best parts of the program," Fredrickson said.

CULTURAL HERITAGE BENEATH THE WAVES

When Ken Merryman started scuba diving in Lake Superior 40 years ago, a lot of his colleagues would take artifacts off the shipwrecks they explored.

"That was the whole purpose," recalled Merryman, a founding member of the Great Lakes Shipwreck Preservation Society. Over the years, diver attitudes and ethics regarding shipwrecks have changed.


photo by Ken Merryman, GLSPS

Today, he and his fellow divers are actively preserving that underwater heritage, with the nomination of three Lake Superior shipwrecks to the National Historic Register completed and two in the works.

Nomination of the *Robert Wallace*, a wooden bulk freighter that sank in 1902, is moving through the review process. The application for nomination of the *Mayflower*, a scow schooner that sank in 1891, is being prepared. Both ships lie in Minnesota waters.

Minnesota's Lake Superior Coastal Program is playing a role, contributing $28,114 for site investigations and documentation, historical research, and in the case of the *Mayflower*, an archaeological evaluation.

"The *Wallace* was interesting structurally – it's the most intact wooden bulk freighter in Minnesota waters," Merryman said. "The *Mayflower* is a little different. It's a chance to make a nice contribution to maritime history."

"No one's ever documented this type of scow schooner in the lake," he said.

The *Mayflower* was carrying sandstone for the construction of Duluth's old Central High School. It was either sailing or being towed by a tug into Duluth when the stone shifted and the ship capsized. The captain went down with the ship; three crew members were rescued.

Discovered in 1991, the *Mayflower* lies 500 feet off the shipping lane about four miles from the Duluth Entry, in about 90 feet of water.

Great Lakes Shipwreck Preservation Society members dove on the site in 2008, but only had 15 feet of visibility. They made a sketch from an earlier video and managed to get a good site drawing.

But when they realized the significance of the wreck, they proposed bringing Keith Meverden, an underwater archaeologist for the Wisconsin Historical Society, to do a detailed archaeological site map. That work likely will begin this fall.

Because it's so lightly built, a lot aren't intact, Merryman said of the scow schooner.

The *Robert Wallace* was carrying 1,600 tons of iron ore bound for Cleveland. It sank shortly after leaving Superior. Its stern pipe broke, and the ship began taking on water. The captain ordered his crew to abandon the vessel. All did so safely.

Discovered in 2006, the *Robert Wallace* rests 7 miles out of Knife River in about 235 feet of water.

As a wooden bulk freighter, it's a good example of the evolution of ships on the Great Lakes, Merryman said. "It hasn't got an amazing story, but it is representative of a class of


photo by Ken Merryman, GLSPS

transitional construction, when ships were going from schooners to steel bulk freighters."

According to the National Historic Register nomination, "They were the prototypes of a commercial vessel class that still serves American commerce, and the *Robert Wallace* gives a rare glimpse into the developmental years of this unique style of Great Lakes' vessel that continues to play an important role in our economy and culture."

The Great Lakes Shipwreck Preservation Society conducted eight dives of the *Robert Wallace*, shooting video, documenting the site and developing a drawing. Meverden wrote up the site description and did the historical research.


photo by Ken Merryman, GLSPS

Minnesota has 10 Great Lakes shipwrecks on the National Register of Historic Places.

The listings started in the 1990s when Scott Anfinson was archaeologist for the Minnesota Historic Preservation Office.

The federal government had passed the Abandoned Shipwrecks Act, which gave states jurisdiction of abandoned historic shipwrecks in their waters. And Anfinson received $500,000 in state gambling revenues to conduct an inventory of the state's shipwrecks.

"We looked at lots of vessels," Anfinson said. "Some we couldn't find. Some were too destroyed." Significant wrecks were nominated for the National Historic Register.

"At the time, with the technology, we had gone as far as we could," Anfinson said of when the project ended.

Since then, new technology and cheaper prices on side-scan sonar, has allowed sports divers to locate shipwrecks in deeper waters and dive to greater depths. These are shipwrecks divers are seeing for the first time, shipwrecks that haven't been stripped bare.

Merryman's band of shipwreck hunters had a "hot streak" in 2004 when they found four shipwrecks. They had to decide what to do with them.

Should the Great Lakes Shipwreck Preservation Society claim ownership under admiralty laws? Knowing preservation groups have a short life, relative to history, they opted for state governments and the National Historic Register, he said.

Minnesota no longer had money available to nominate shipwrecks, so the Coastal Program became involved.

"Shipwreck nominations preserve North Shore's cultural fabric"

Shipwrecks are an important part of local history, part of the fabric of the coastal community, Program Manager Pat Collins said, noting that most of the Coastal Program's previous efforts to preserve historically significant resources have been for things above water.

"The cold, nutrient poor waters of Lake Superior preserve some of these old wooden vessels better here than anywhere else in the world. Because of the nature of Lake Superior, the shipwrecks don't deteriorate very fast and they don't get a lot of biological growth on them like they would see in warmer, more productive bodies of water," Collins said. "As a result, many of the shipwrecks in Lake Superior are really well preserved examples of wooden ship building."

"The National Register is the standard of importance," Anfinson said, citing a list of reasons why a historic site should be nominated: public recognition, it kicks in an automatic environmental review if a project might adversely affect a site, and the nomination itself provides a wealth of information for historians.

"A people without a history are a people without a heritage," Anfinson said. "Shipwrecks are a part of our heritage. You can't understand iron mining. You can't understand tourism. You can't understand the grain trade without them."

And while the nomination doesn't stop people from pilfering artifacts off a shipwreck, establishing ownership does provide a way for the state to prosecute those who do.

A lot of times, preservation still comes down to the divers' ethic – take only pictures, leave only bubbles – Merryman admits.

That ethic is improving.

When sports divers started, back in the 1950s, they would dive on these pristine wrecks. But over the years, they stripped the wrecks bare, Anfinson said. "They were like big game hunters, except they took artifacts to prove their expedition."


photo by Ken Merryman, GLSPS

Now, many of them realize that they've given their kids a lesser experience than they had, he said. "It's really up to the generation at hand to preserve and manage these sites," Merryman said.


photo by Ken Merryman, GLSPS

"People who dive shipwrecks all enjoy different parts of them: the story of the tragedy, the history, the structure, exploring the artifacts," Merryman said. "I really enjoy seeing something for the first time. I know no one's touched this. It's just like it came down."


photo by Ken Merryman, GLSPS


photo by Ken Merryman, GLSPS


Ken Merryman, GLSPS
photo by Steve Daniel

The "Sinking of the *Robert Wallace*," as per the National Historic Registry nomination

On Monday, 17 November 1902, the *Robert Wallace* departed Superior, Wisconsin, around 7:00 PM after loading 1,600 tons of ore at the Allouez Number 1 ore dock (Evening Telegram 1902). With the schooner *Ashland* in tow, the pair was bound for Cleveland. About 11:00 PM, approximately 13 miles southeast of Two Harbors, Minnesota, the *Robert Wallace* developed a heavy vibration, and a few minutes later the second mate informed Captain Nicholson that the vessel was taking on a large amount of water in the stern. A hasty examination revealed that the *Robert Wallace's* stern pipe had broken and Captain Nicholson ordered the vessel abandoned. The *Robert Wallace's* crew packed their belongings and anything else they could carry. The towline was severed, the lifeboats were launched and rowed to the *Ashland*, and the *Robert Wallace* was left to meet her fate with all her lights burning. The *Ashland* lit distress signals that alerted the tug *Edna G*, who took the Ashland in tow to Two Harbors (Bowling Green State University 2008c; Evening Telegram 1902; Wolff and Holden 1990).

As the *Ashland* was being towed to Two Harbors, the steamer *Whitney*, bound for Superior to load grain, came across the *Robert Wallace* 16 miles from the Superior entrance. As the *Whitney* approached within 1,000 feet, the *Robert Wallace's* stern slipped beneath the surface and she slid silently out of site. Captain Charles T. Gunderson of the Whitney described it as a "pretty sight to see her slide into the lake as if she were just sliding from the stays in a shipyard" (Evening Telegram 1902). Captain Gunderson lowered his lifeboats to search the area but found no trace of the vessel or her crew.

After getting the *Ashland* safely tied up in Two Harbors, the *Edna G* returned to the lake and made a long search for the *Robert Wallace* in hope that they could tow her to shallow water before she sank, but they found no trace of the vessel (ACGNFPL 2008c; Bayfield County Press 1902; Port Huron Daily Times 1902). The following morning, however, Captain B. F. Howard of the steamer *Argo* reported he had passed the *Robert Wallace's* Texas house floating on the lake with her navigation lanterns still burning, apparently having detached from the vessel on her descent (Evening Telegram 1902; Wolff and Holden 1990). The *Robert Wallace* had an estimated value of $40,000 and was insured for $35,000 by the Smith, Davis & Company in Buffalo, New York. Her cargo was insured for its full value of $5,600 (Bayfield County Press 1902). On 30 January 1903 the *Robert Wallace's* final enrollment was surrendered at Cleveland (Bureau of Navigation 1900). *National Registry*

A VERY SUPERIOR HIKING TRAIL

Best known for its breath-taking views from the ridgeline, the Superior Hiking Trail offers one more way for people to experience Lake Superior and its natural areas inland.

It's another economic niche, another form of recreation, another opportunity to get out on the North Shore, describes Gayle Coyer, executive director of the Superior Hiking Trail Association.

Of the five corridors along Lake Superior's Minnesota coastline (North Shore State Trail for snowmobiles, U.S. Highway 61, the Gitchi-Gami State Trail for bikes, and the Lake Superior Water Trail for kayaks), the Superior Hiking Trail offers the most remote and varied access.

Built and maintained by volunteers, the 205-mile footpath extends from Two Harbors to within sight of the Canadian

border. Work continues to connect it to a 42-mile segment through Duluth. Once completed, the trail will be more than 300 miles long.

It traverses boreal, hardwood and re-growth forests, ascends to rock outcroppings and cliffs, descends into river and creek valleys. It connects seven, and eventually eight, state parks, allowing access to some of their most remote areas. It offers spectacular views.

"You are very much aware you are above this big lake," said Jan Green who hikes the trail.

"The Superior Hiking Trail offers an opportunity for people to experience a wilder part of Lake Superior, its tributary streams and the bedrock hills that form the North Shore," said Pat Collins, manager of Minnesota's Lake Superior Coastal Program. "Because of the trail, people can get to waterfalls, secluded river gorges, forest ecosystems shaped by the climatic influence of the lake, and views of Lake Superior that would otherwise be inaccessible."

The Coastal Program has given $148,536 for the trail, including $124,403 to replace four bridges.

"It's a nuts and bolts issue," Coyer said. "Do you have safe bridges on the trail?"

An inspection of the major bridges in Minnesota's state parks and waysides showed five Superior Hiking Trail bridges were "prone to failure," said Phil Leversedge, Tettegouche State Park manager.

"There were concerns," he said. "Safely, you couldn't put more than one or two persons on the bridges at a time."

The Department of Natural Resources, Superior Hiking Trail Association and Coastal Program worked to transfer ownership of the bridges to the state and replace them.

Since 2004, three bridges, across the Caribou, Manitou and Cross rivers, have been replaced with pre-manufactured fiberglass structures. Work on replacing a fourth bridge, across the Kadunce River, is scheduled to start this fall.

"We put those bridges in to the best of our ability," Coyer said, describing structures made of fallen logs found on the remote sites and small pieces of lumber that could be carried into them.

"Superior Hiking Trail lets people experience remotest areas of the North Shore"

Coastal Program funding paid for the fiberglass modular bridges, which are lighter than steel and can be carried in pieces, and for major materials such as timbers and concrete.

The DNR provided the labor and equipment, including the use of its firefighting helicopters to airlift nearly 30,000 pounds of bridge parts, concrete, water and tools to each site. The helicopters even were used to set and hold the bridge trusses in place while crews bolted them onto abutments that are firmly anchored into rock.

"It's the difference between what I would hike out into the woods and build, versus what an engineer would design," Leversedge said in describing the new bridges.

"I don't know if it's changed the hiking experience, but it's definitely improved the aspect of trail maintenance," Coyer said, noting that the association's hand-built bridges often washed out during spring runoff.

Other Coastal Program grants funded:

- $2,512 for GPS mapping of the trail, a process that revealed the trail wasn't always on the property it was supposed to be and allowed for the creation of accurate maps. (All private land issues have been resolved, Coyer noted.)
- $12,511 to site the trail through Duluth.
- $9,110 to publish 1,500 copies of the booklet, "Natural History and Geology along the Superior Hiking Trail through Duluth."

"Having helped scout the trail through the city, I became impressed with the wonderful natural areas that it was opening up to people," said author John Green, a retired geology professor, naturalist and hiker. "It was a great opportunity to show people the great areas that can be accessed along the hiking trail."

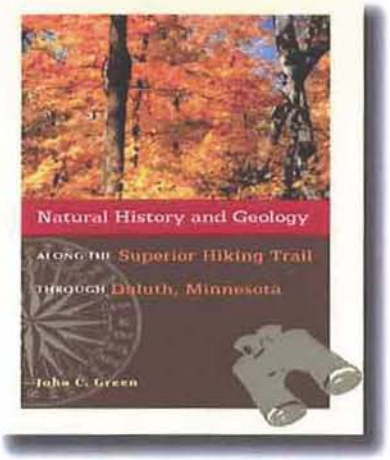
Green's book details the geology, native plants and wildlife hikers see along Duluth's segment of the trail, suggests what to look for in each season, and takes you on a historical and cultural tour of 12 specific trail sections.

The book is available through the Superior Hiking Trail Association, as well as at Northern Lights and Gifts, the UMD bookstore and Hartley Nature Center, all in Duluth.

"Trail enthusiasts have run into it, and they like it." said Green's wife, Jan.

How many people use the trail?

"It's so difficult to get any handle on that. You can't put a turnstile at the trail heads," John Green said.



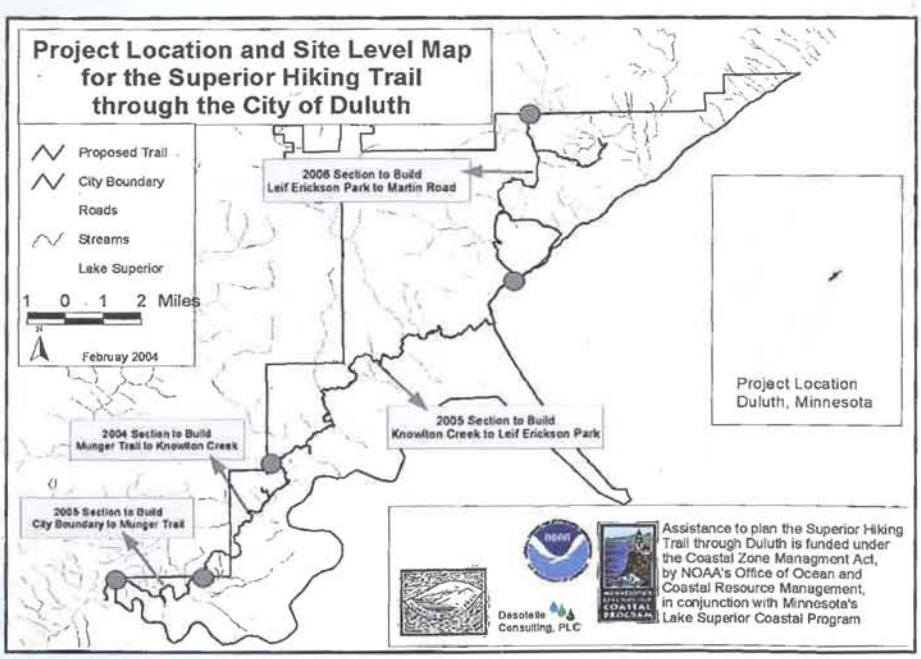
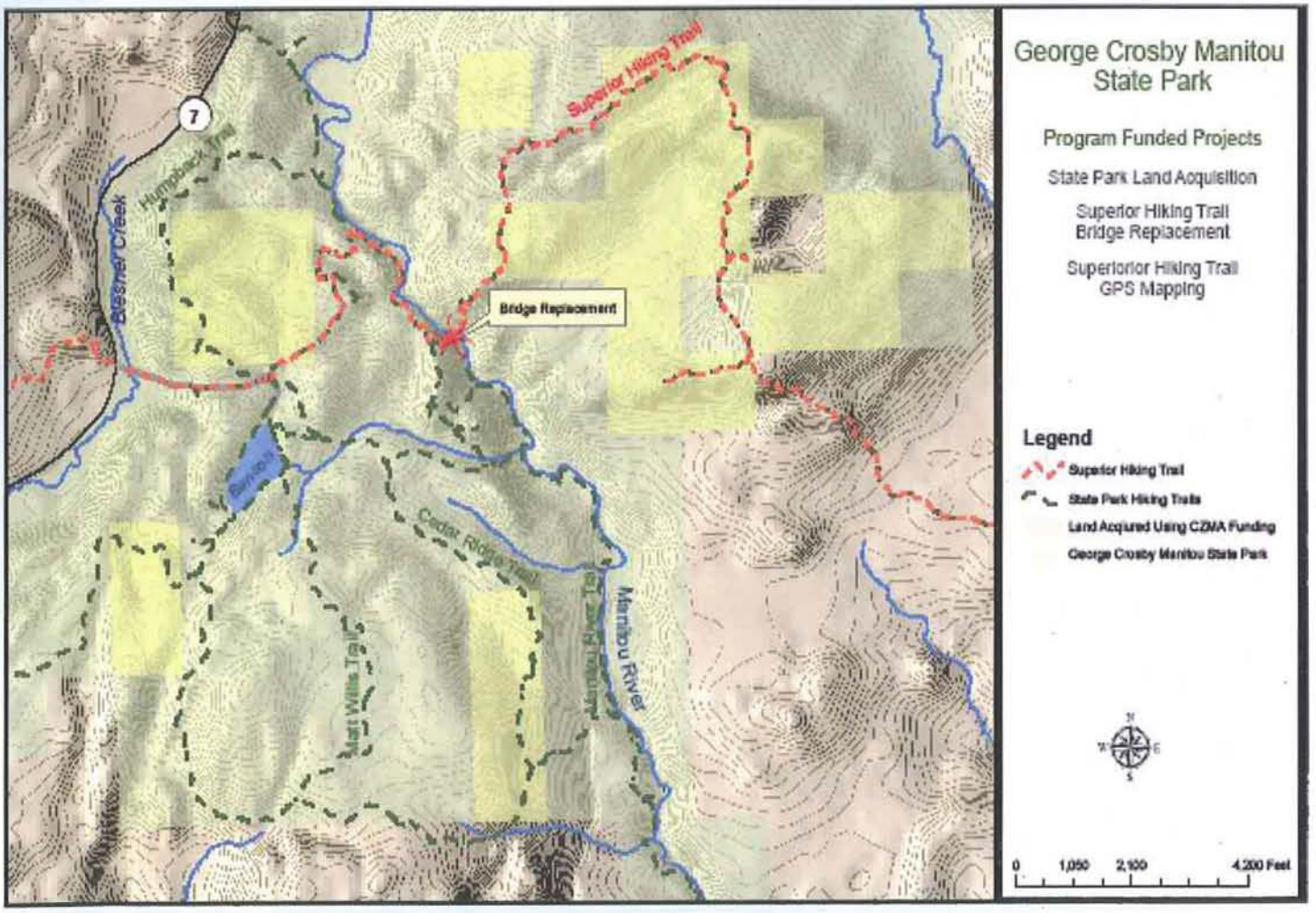
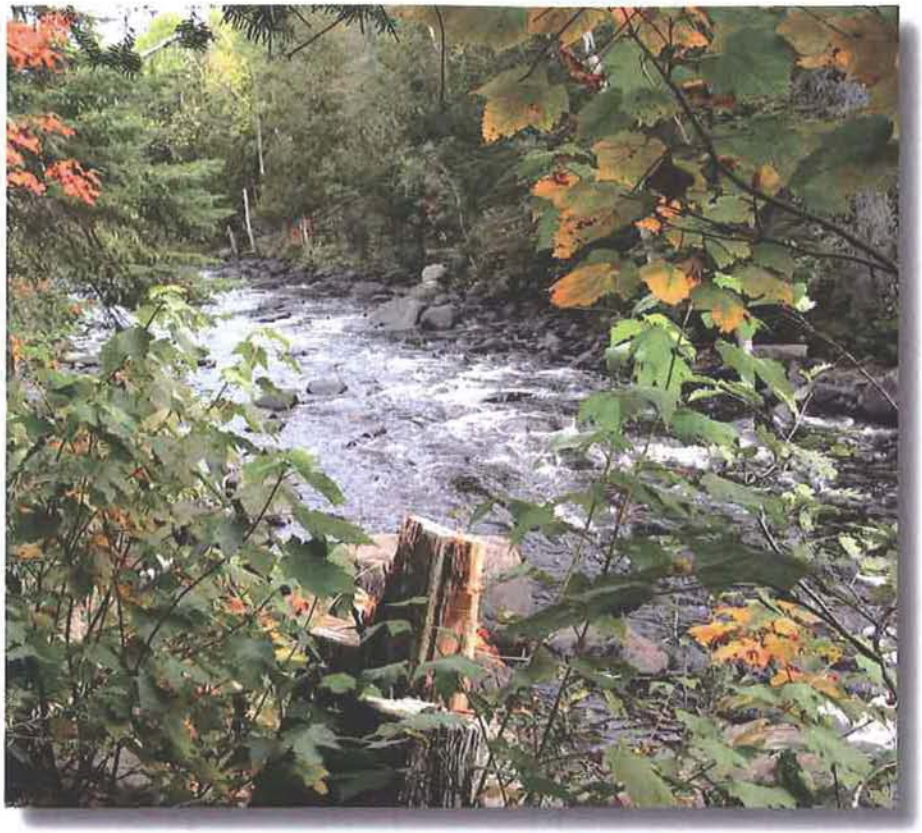


photo by Superior Hiking Trail Association





Mid-spring through mid-fall, Superior Shuttle picks up and drops off hikers at trail heads and locations along the trail on a regular route, Fridays through Sundays, and makes special runs outside the route or on other days. The van transported about 1,100 passengers in 2008 and expects to do the same or better in 2009.

The Superior Hiking Trail Association has 3,200 members, 70 percent of whom are from the Twin Cities area.

Member Tom LeMay discovered the trail in 1997 while on a bed-and-breakfast trip up the North Shore with his wife. He started with day hikes then worked up to overnight backpacking trips.

"It offers just about all the challenges you like," said LeMay, who likes the trail most for its scenic variety – rocks, rivers, valleys, forests and, especially, any ridgeline view of Lake Superior.

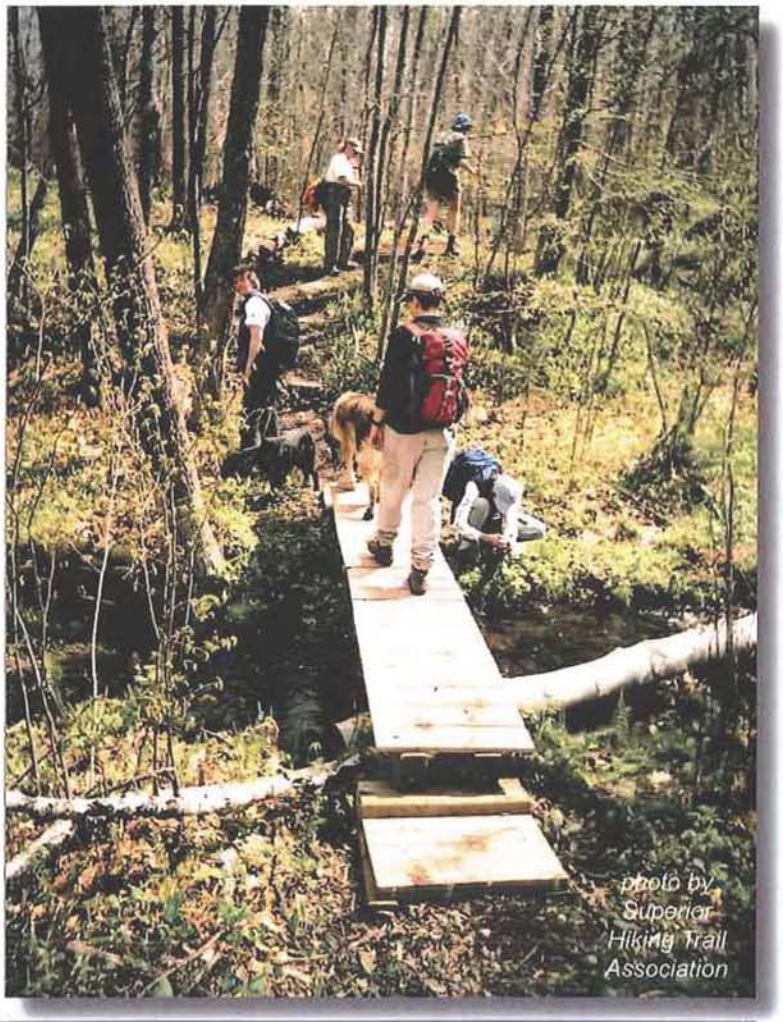
"It turned into a passion," said LeMay, who's on the trail 12 to 15 days a year. He did a through hike in 2007 when he retired and one day plans to do a tour of the trail's spurs.

LeMay leads trips on the trail and does presentations about the trail at REI stores in the Twin Cities.

"My mission is to spread the word," he said. "It's such a great place – that North Shore."

That word could spread farther.

Federal legislation is pending that would make the trail part of the North Country National Scenic Trail, a 4,600-mile trail that crosses seven states from New York to North Dakota.



MANAGING COASTAL INFORMATION

Some of the most important work Minnesota's Lake Superior Coastal Program is doing involves the accumulation of GIS data about its coastal communities.

In 10 years, the Coastal Program has spent nearly $2 million to acquire, analyze, develop and distribute that data. Communities actively use GIS for planning, identifying and fixing problems, and projecting scenarios into the future.

"We're trying to help communities make better land use decisions..." says Coastal Program Manager Pat Collins. "We're trying to help them do their jobs better."

"It's important to understand with a little more clarity just what we have up here... to map it all out at a current-day level," says Stacy Radosevich, a member of the Coastal Program's advisory council. "That's a piece of the funding that isn't exciting, but it's nuts and bolts to know what we have to protect."

A planning director can look at GIS data about a piece of property and say "yes" or "no" to issuing a land use permit. Or city officials can take GIS data and use it on a broader scale to develop a stormwater management plan.

Using GIS analysis, Duluth Township updated its land use plan and developed a zoning ordinance that provides additional protections for "sensitive" land near Lake Superior and its tributaries.

GIS is helping residents throughout the coastal watershed deal with problems like stream bank erosion and flooding on their properties.

Clinton Little, the Coastal Program's GIS support specialist, collects the layers of information that already are available about a community, identifies what data is missing, helps communities obtain resources and tools to generate that missing data, and provides the technical assistance the communities need to use that data.

The possibilities of data to be collected are endless. Little rattles off a list of "administrative" layers: zoning districts, parcel maps, and infrastructure maps showing roads, sewage lines, storm sewers, culverts, wells. Then there are the "environmental" layers: inventories of wetlands, streams, land cover, soils, topography, land imagery.

Collins likens GIS to trying on different lenses so you can look at something in different ways and being able to put several different lenses on at the same time.

"With a good map, you can really relay a lot of complex information to people in a way they can understand," Collins says. "It's a powerful tool."

And GIS makes it easier to update the information, distribute it, and even ask questions of the map, Collins says.

As Duluth Township updated its land use plan and developed a new zoning ordinance, Little would bring "live" GIS to meetings and public hearings. "I'd present the zoning layer using GIS," Little said. "If someone didn't like a boundary, we could change it right there."

Little's GIS demonstrations added the powerful dimension of bringing what the township was trying to accomplish home to people, according to Sue Lawson, Duluth Township's planning director.

"People could look at their parcel and see how close it is to streams, see what their land looks like in relation to woods," Lawson said. "And they could see what was being proposed for it."

At the time, concerns were growing about development in the township, especially along the ridgeline and down to Lake Superior, where the land is steep, the rivers can be flashy with runoff and a lot of soils are erosive. Arguments were being made to increase lot sizes from the current 4 acres to 9 acres.

GIS enabled the compromise: a sensitive area overlay. Characteristics of land in the overlay include steep slopes, shallow soils, high-erosion potential, flood plains and wetlands, limited groundwater recharge areas, limited wastewater treatment capacity.

Property owners in the sensitive area overlay are required to limit impervious surfaces to 5 percent of their total lot size. They also are required to develop a mitigation plan if sensitive areas or resources are identified on their property and outline measures or actions they will take to protect those resources or minimize the impact on them.

"You have to look at development more comprehensively in the sensitive area overlay," said Jan Green, a planning commission member.

Additionally, the Coastal Program paid for a computer for GIS applications, a printer, a computer projector, powered speakers and a screen to involve township residents in updating and implementing the land use plan at public hearings. At

Planning Commission meetings, information about a piece of property can be brought up on the screen, while members decide on issuing conditional use permits or zoning variances.

"You get a better informed decision," Lawson said.

When Tristan Beaster of Cook County Soil and Water Conservation District gets a call from a property owner seeking a wetlands determination or advice on how to deal with stream bank erosion or flooding, he heads out to explore the site. He takes a GPS unit and, depending on the type of call, books to help him identify soils or wetlands plants and an eye level to calculate slope.

"Most people are willing to listen to reason," says Al Katz, a founding member of the Coastal Council. "People are persuasible if you have the information."

"I use GIS to link the things I see on the ground with some sort of map," he explains. He sends the map as well as any preliminary recommendations to the property owner. "It's a tool for the property owner to use to make a better decision."

On a recent call, a stream had overtopped its banks and was flooding a homeowner's gardens. There hadn't been a major storm or flooding at other streams, so indications pointed to a nearby beaver dam that had failed. Beaster noted the location and condition of a road culvert and ditch.

"For this homeowner, there's not a lot he can do on his property," Beaster said. "It becomes a public infrastructure issue." However, he notified the county's road engineer about the culvert that, if realigned, might alleviate future flooding.

For another property owner, Superior National at Lutsen, Beaster was able to recommend solutions to an erosion problem. To accommodate new homes that were being built, the golf course had moved the overflow pipe in its irrigation pond.

With spring snowmelt, runoff from the pond created a gully about 8 to 10 feet deep and 10 feet across.

"We were in danger of losing the bank of our irrigation pond and our entire irrigation pond," said Mike Davies, grounds superintendent. "I didn't know what we were going to do with it."

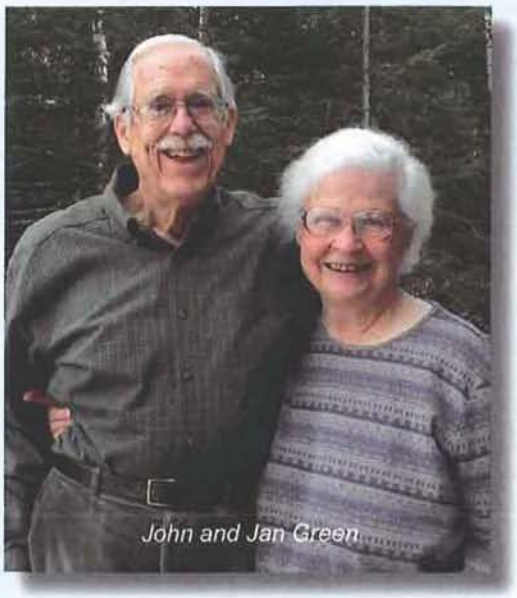

John and Jan Green


photo by Cook County SWCD

Beaster and Keith Anderson, an engineer with the Lake Superior Association of Soil and Water Conservation Districts, visited the site, developing a map and set of plans to mitigate the problem. They provided three different options.

The golf course extended the 18-foot overflow pipe to 85 feet and ran it from the top of the pond all the way down the slope where it drains into wetlands and then into the Poplar River.

Site visits can really make a difference in a landowner's decision-making: how to handle stormwater, how to build a septic system, where to put or not to put a driveway, Collins says.

Rebecca Wiinanen, Cook County's Soil and Water Conservation District Manager, sends a visitor to check out a demonstration rock-check dam that's been built alongside 4th Avenue West, just below the courthouse in Grand Marais, to slow stormwater runoff.

With Coastal Program funding, her office will build two demonstration rain gardens. And later this year, it will target a group of landowners and build a series of projects aimed at reducing stormwater runoff down through a section of the city.

GREENING A ROOF

Tony Mancuso pulls weeds out of a patch of sedum as he touts the benefits of extensive green roofs – they capture rainwater, lengthen the roof's lifetime, lower repair costs, save on utilities, lessen the heat off a building, and improve the aesthetic experience for people in higher buildings.

"We're giving it a test drive," the St. Louis County property manager says from atop the county motor pool garage in downtown Duluth.

About 10,000 square feet of roof is covered with contiguous flat containers of red, yellow and green sedum. At maturity, they will overlap, and the roof virtually will become one big sedum plant.

The succulents should be able to retain 3/4 - to 1-inch of rainwater before any water hits the roof drains.

"We look at these older buildings downtown and there's not a speck of green to consider," Mancuso said. "It's all roofs, streets and sidewalks. There's very little pervious surface."

So Mancuso decided to create some.

Armed with research on ways a green roof could save money and an argument that the county should be a leader in green building, he convinced the County Board to consider installing one.

A $50,000 grant from Minnesota's Lake Superior Coastal Program to help defray the cost tipped the scale.

"This is very new to this region, and the county is very fiscally conservative," Mancuso said. "Having the Coastal Program grant available was really key. It softened the financial premium on the price difference between a standard roof and a green roof."

Mike Ecklund of AW Kuettel and Sons managed the $162,465 project.

"There's a great opportunity there, to try to demonstrate some green building concepts to the community,"

Ecklund's crew laid an additional layer of roof membrane as a "root barrier" on the garage's two-year-old rubber roof, then installed aluminum edging around the garden areas, concrete pavers for walkways and the containers of sedum.

His company has installed other green roofs, mostly dirt and sod. This was probably its largest and one of a few using live roof modules, he said.

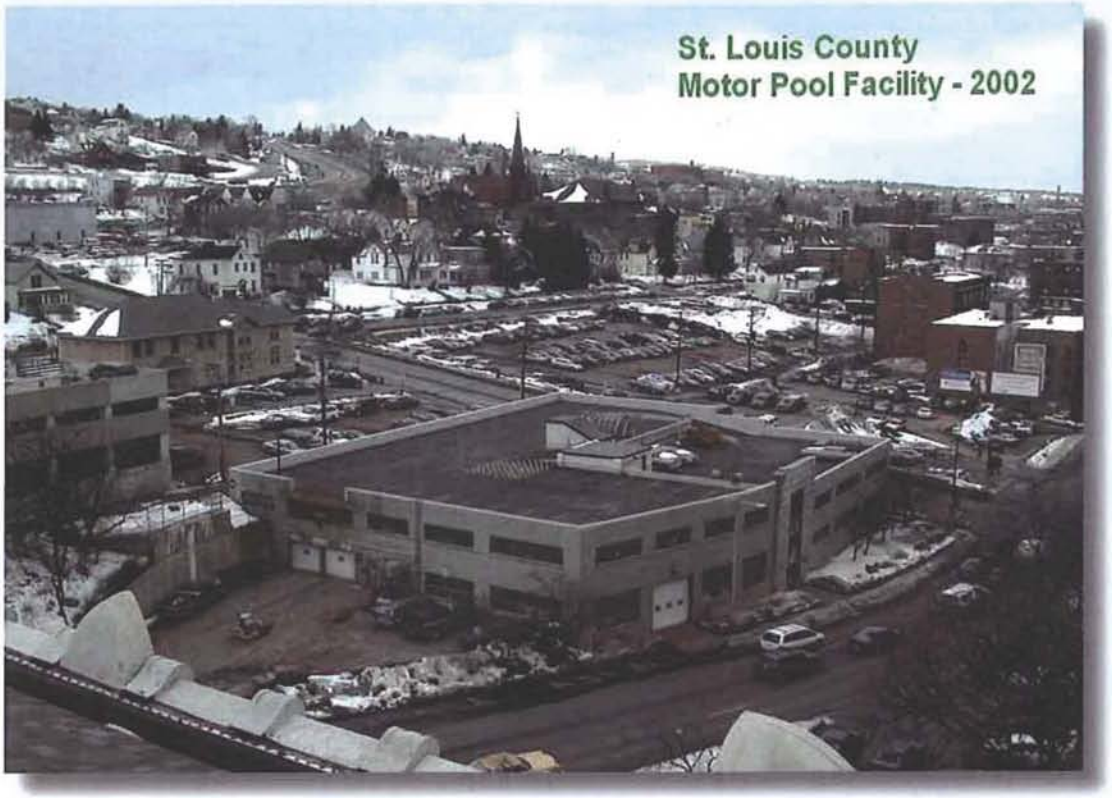
"It's something coming of age here," he said. "The trend is more toward something green."

Back on the rooftop, Mancuso rights a thermometer that monitors the air temperature above a sedum bed. A second thermometer on another section of the garage monitors the air temperature above black rubber roof.

On a 90-degree day in summer, the air temperature 30 inches above a black rubber roof can reach 140 to 175 degrees, he said. On a green roof it's only 5 degrees above ambient, or 95.

No direct sunlight hits the rubber membrane.

"The roof isn't expanding and contracting during the day," he said. "Movement will kill a roof."



He estimates the lifespan of a traditional black rubber roof to be about 20 years. He believes the green roof will expand the life of this one to about 60 years.

"It will pay for itself."

Mancuso and other experts cite a 25 percent insulation factor from the dead air space the plants create and about a 50 percent reduction in the amount of heat wind strips off the building.

Tony Mancuso wanted to install a green roof atop St. Louis County's motor pool garage. He was convinced of the benefits – the cost-savings incurred by extending the life of the rubber roof and lowering the heating costs of the building, environmental preservation created by eliminating stormwater runoff into Lake Superior, the educational opportunity to show private contractors a model green roof, the improved aesthetics (unintended) for occupants of nearby tall buildings see. But with a fiscally conservative county board and a process that was untested in the region, it took money from the Coastal Program to "tip the scale."

MINNESOTA'S LAKE SUPERIOR COASTAL PROGRAM

"With utilities costs going up, I'm putting my money on that," Mancuso said.

The Minnesota Pollution Control Agency plans to install monitors to measure stormwater runoff from the building.

"It's all about slowing down the water and letting it cool off, before it gets into the stream or the lake," said Pat Collins, Coastal Program manager.

"When water falls on a regular roof, it gets treated as waste," Collins explained. "They're re-creating this vegetated system that absorbs water and puts it back into the atmosphere through evaporation. It helps reduce the heat-island effect common in urban landscapes. It helps reduce the flow of stormwater. It's cycling back around, more like the way it would in a forest."

"Green roof a model of stormwater control"

Mancuso and a co-worker have led 100 people to the roof's viewing deck for tours this year.

"There's a great opportunity there, to try to demonstrate some green building concepts to the community," Mancuso said.

AW Kuettel and Sons will be installing a green roof on the University of Minnesota Duluth's new Bagley Nature Center, after university officials looked at St. Louis County's.

"It was good exposure for us," Ecklund said.

"We need to take a few chances to kind of set the stage, and then have the information available," Mancuso said.

And he's not done yet.

The county is teaming up with others to install raised garden beds and recycled deck pavers on the motor pool garage's remaining 8,000 square feet of rooftop.

Interns from UMD's environmental studies program will install the pervious pavers, which are 95 percent recycled pop bottles, milk jugs and tires, and the raised beds.

Bob Olen of the University of Minnesota Extension Service in St. Louis County and his group of Master Gardeners will help select the plants and make sure there's a good mix of soil to support quality growth.

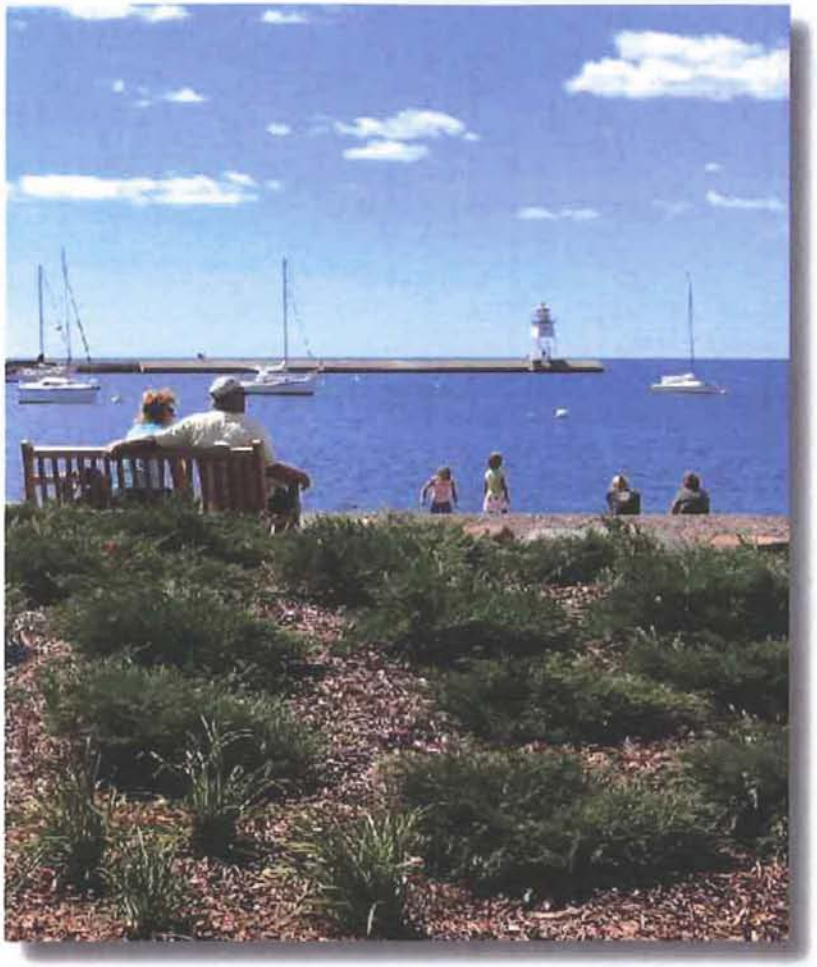
The Duluth Community Garden Program should be able to grow food on the downtown rooftop as early as 2010.

"A deer-free, sun-filled spot seems like heaven to me," said Executive Director Carrie Slater Duffy, whose organization received a grant from the Northeast Minnesota Regional Sustainable Development Partnership for the project. She envisions developing a rooftop educational program geared toward teaching young people how to grow food for the market and sell it through a local farmer's market or cooperative.

Slater Duffy is sold on the environmental benefits an extensive green roof offers. "To add an element of food production – it just blows you away," she said. "It's a great solution – energy-wise, food-wise. I'm excited to be on the forefront of it."

There's a need for more local foods grown in an urban setting, Mancuso said. "The Coastal Program also offered us a springboard and opportunity to explore this."

A HARBOR PARK IN GRAND MARAIS



For years, the Standard station was a landmark for people traveling to Grand Marais.

Mike Hanafin remembers seeing its lighted sign as he drove off the Gunflint Trail around midnight one night, low on gas after dropping off his son for a camping trip. "I was saved," he said.

Some 30 years later, Hanafin and his wife Lori sit on a park bench looking out at Lake Superior. Six sailboats are anchored in the fog-enshrouded harbor. Children skip rocks from the beach. Dark clouds move and bright sunlight breaks through, creating a dramatic, shifting backdrop.

"It's food for the soul," says Hanafin, now of Phoenix. His family has vacationed in Grand Marais since 1967.

He misses Gene Erickson's full-service gas station that was staffed with mechanics even on weekends and summer holidays, but he likes the new park that has replaced it.

Minnesota's Lake Superior Coastal Program provided two grants for Harbor Park: $27,500 for planning and design in 1999, and $100,000 for construction in 2005.

The park is a graceful yet practical transition from downtown to the harbor.

At its main entrance, you step onto a circular concrete pavilion where the community stages events like Fisherman's Picnic. Footings are in place for an eventual tent, and there are ample electrical outlets, water outlets and concrete walls that double as seats.

Crushed granite sand walkways, which can accommodate bikes, strollers and wheelchairs, lead visitors past groupings of native plants and strategically placed boulders. A low rock berm

separates the park from the beach and provides a natural seat from which to watch the lake.

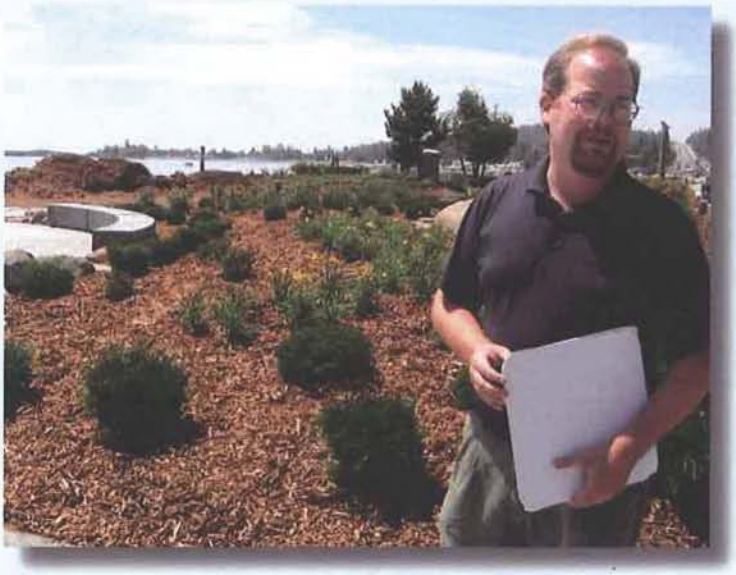
A handful of Minnesota Pollution Control Agency monitoring wells remain, a reminder of the contaminated soils and underground storage tanks that have been removed.

Former property owner Erickson was facing the need to remove his old tanks then spend about $1 million on new pumps, new tanks and upgrading his station. For years, his station had sold the most gasoline in town. But a lot of that business had moved to U.S. Highway 61.

He considered building condos on the site.

When the community heard Erickson was thinking about retiring, residents rallied around the idea of making the prime piece of waterfront land a public space.

Erickson met with Grand Marais' then mayor. "I had a price: $760,000," Erickson recalled. "We came down to $700,000.



Then I came down another $100,000." A deal was struck and a purchase agreement signed with the Trust for Public Lands.

Erickson closed his station on June 22, 2000. He had been in business 34 years.

Erickson worked with the MPCA to remove the tanks and clean up the contaminated soils, a job that officially has been completed.

Before the paved highway up the North Shore, ships brought gasoline to Grand Marais and unloaded it into above-ground storage tanks on the shore. That was in the 1920s, long before Erickson owned the site.

"To take these industrial parts of the harbor and transition them has been a goal of the community in the comprehensive plan since they had one," City Administrator Mike Roth said.

The service station was removed.

"Everyone felt good about that," Roth said. "They could see the harbor."

The community began designing its park.

"Part of the grand design for Grand Marais, the master plan, had been that the shoreline becomes something everyone could use," said Betty McDonnell, who worked on the park. "We wanted it to be open, open land for everyone to use. That's what it has become."

Pat Collins, Coastal Program manager, agrees.

"This is the kind of thing we really get excited about being able to fund, because it's such a direct connection between people and the lake," Collins said. "Plus, it's such a big improvement to land use. And, it's what people wanted to see there."

Still, the Coastal Program rejected the city's first grant application for money to build the park.

"They turned us down," Roth said. "But they gave us some really good feedback. They were convinced our budget wasn't doable."

Plans were scaled back. Concrete replaced cut stone. Trellises were eliminated. Spigots replaced a drip irrigation system. Buying the tent was put on hold. The total cost was brought down.

For years, the iconic Standard station had been a landmark in Grand Marais. Today, that last vestige of industry in the harbor is gone. The station, and its contaminated soils and underground tanks, have been removed. Coastal Program grants helped the community design and build a park on the site.

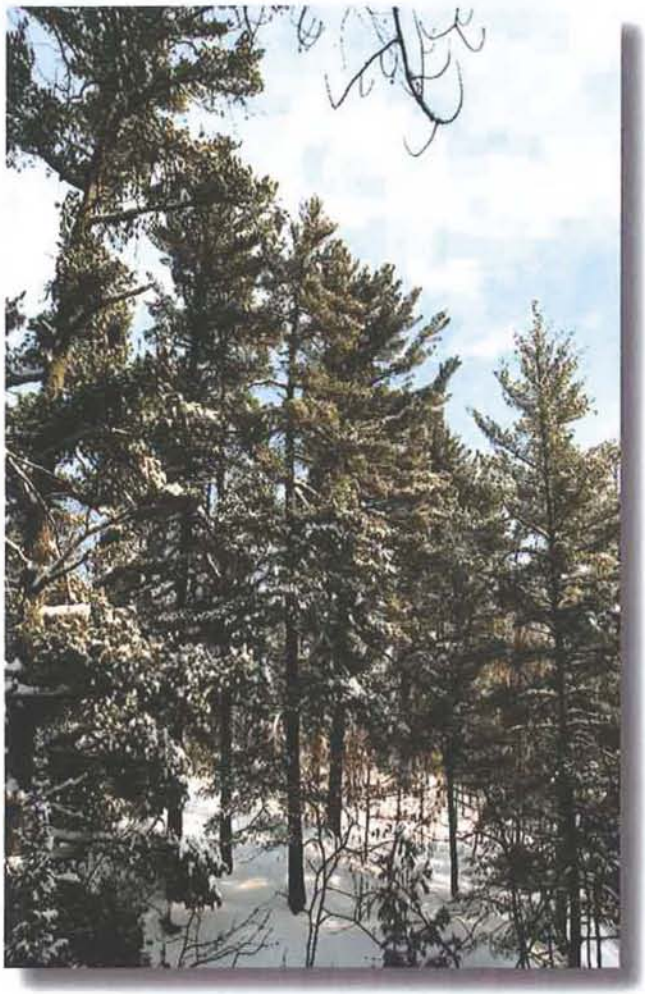
The project ended up getting more community support, about $125,000, in the way of donations and effort, Roth said.

"A rejection can be a disincentive or an incentive," said Jim Shinners of Harbor Inn, a motel and restaurant across the street from the park. "We made it an incentive."

Four different restaurants held a fundraiser that sold out. Some people who didn't get tickets decided to hold private dinners in their own homes and collect donations for the cause, he recalled.

Buck's Hardware supplied all of the plants at cost. Hedstrom Lumber donated the bark mulch. Cook County's Master Gardeners coordinated the volunteer planting effort.

The Coastal Program money was the key that allowed us to leverage the rest of the money needed to build the park, Shinners said. "But there could be condos there now, if Gene hadn't had the foresight to make the commitment he did."



ABOUT THE COASTAL PROGRAM

Minnesota's Lake Superior Coastal Program is funded by the U.S. Department of Commerce's, National Oceanic and Atmospheric Administration, through the Office of Ocean and Coastal Resource Management. The Program is administered by the MN Department of Natural Resources - Waters with offices at 1568 Hwy 2, Two Harbors, MN 55616. The Coastal Program website is mndnr.gov/waters/lakesuperior.

Our mission is to preserve, protect, develop and where possible restore, and enhance coastal resources for current and future generations.

We provide technical and financial assistance for local communities to balance protection of coastal resources with providing residents and visitors places to work, live and play.

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THE GOVERNOR'S COUNCIL ON MINNESOTA'S COASTAL PROGRAM

A fundamental component of Minnesota's Lake Superior Coastal Program (MLSCP) is the Governor's Council on Minnesota's Coastal Program. This Coastal Council is a key part of the mechanism through which MLSCP implements its pass-through grant program. The Coastal Council helps establish program priorities, recommends projects for funding, reviews the budget, and conducts a biennial review of the Coastal Program. The Coastal Council consists of fifteen members, with three persons from each of the four counties located within the coastal boundary. The remaining three members are selected from an at-large pool of names. Members are appointed by the governor.

Coastal Council Members		
Carlton County	**Lake County**	**At-Large**
Dan Belden	John Eaton	JoEllen Hurr
Dick Brenner	Rick Goutermont	Stacy Radosevich
Vacant	Jim Linscheid	Tim Rogers
St. Louis County	**Cook County**	
Kelly Cooke	Jim Johnson	
Al Katz	Bonnie MacLean	
Mary Ann Sironen	Keck Melby	

Past Coastal Council members include Howard Rosted and Bob Pokela from Carlton County, James Hall and Thomas Spence from Cook County, Arnold Overby and Louise Thureen from LakeCounty and Joanne Fay and Helena Jackson from St. Louis County.