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The Life Of A Lineman

It Takes A Village

Titans Of Technology



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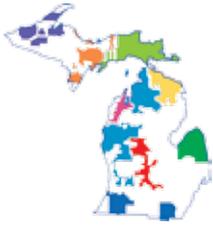
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Please notify your electric cooperative.
See page 4 for contact information.

IN THIS ISSUE

ON THE COVER*

The 4,300-square-mile Thunder Bay National Marine Sanctuary, located on Lake Huron in Alpena, protects one of America's best-preserved and nationally-significant collections of shipwrecks.

**Some co-op editions have a different cover.*

Photo courtesy of NOAA Thunder Bay NMS

IN YOUR WORDS

Our new question of the month section of *Michigan Country Lines*. Let us know your answer and it may appear in the next month's issue or on your electric co-op's social media site. Please answer the question in your own words at <http://bit.ly/1Mg17W5>.

Now the question:

What in your life are you most thankful for?

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OTHER INFORMATION

Date of Incorporation: Sept. 30, 1937

Fiscal year-end: Dec. 31

countrylines.com/coops/ontonagon

Ontonagon County REA is an equal opportunity provider and employer.

The Life of a Lineman



Debbie Miles
General Manager

They wake before the sun, pour steaming cups of coffee, and kiss their families goodbye. After swinging by the office to get the day's orders, seven men climb into their trucks and head out. Our Ontonagon REA lineworkers form a solid team with one job: to deliver safe, reliable electricity. But that job can change in a million ways when rough weather steps in.

We often take power—and the men and women who provide it—for granted. Let's take a moment and stand in their boots. Lineworkers have to work safely, smart, and efficiently—all while 40 feet in the air wearing sturdy, thick rubber gloves. On a typical day, lineworkers maintain electrical distribution lines or build service to new homes and businesses. They have a lot on their plates. But when our dispatch center calls crews with a problem, everything else takes a backseat. Power restoration takes precedence on a lineworker's to-do list. These brave workers are always on-call. We have crews standing by to serve you 24 hours a day, seven days a week. Can you imagine getting a call at 3 a.m. telling you to work outside in weather most people are not willing to face. Our lineworkers face harsh elements daily, all to serve you.

Lineworkers also focus on safety; the lives of their coworkers are on the line. Job safety is important to everyone, no matter your occupation. But for lineworkers, there can be no slip-ups or careless actions. Mistakes can cost a limb or life. When you put your life in the hands of co-workers every day, they become more than colleagues. They're family. The Ontonagon crews have not had a lost-time accident in over nine years.

That sense of family extends to electric co-ops across the nation. One of our principles is "cooperation among cooperatives." We help other co-ops in their time of need, and they extend that service to us, too. It's reassuring to know if a severe storm strikes, a national team of lineworkers stands ready to answer the call.

To be ready to respond no matter the situation or weather conditions, lineworkers are highly trained. At Ontonagon electric co-op, lineworkers go through regular training to ensure they can work safely with various kinds of equipment and the equipment gets tested regularly.

These highly skilled employees light our homes and businesses every day. They endure harsh weather and long hours, all to make our lives better. Today (and every day), please take a moment to thank them. Ontonagon co-op's lineworkers are the heart of the Co-op Nation, proud and strong. ■

Helping to Keep the Lights On

The trajectory some people take in their lifetime in regard to their career is not always a straight line and that certainly has been true for Ontonagon REA lineman Dony Ison. After graduating from Ontonagon high school in 1993, Ison entered the U.S. Navy for eight years (four years active as an electrician's mate 3rd class, four years reserve in the Seabees, where he



started as a shipboard electrician and concluded as a construction electrician). After that, he worked summers at the mill in Ontonagon for a couple of years while attending Gogebic Community College and also at Indianhead Mountain Resort. In August 2000, Ison was working as a kayak instructor at the Apostle Islands National Lakeshore Park when a friend told him that Ontonagon REA was hiring. Looking to get back closer to home, he applied, and after 15 years on the job says, "It's been the best decision I ever made." A sentiment he says is largely due to the fact that he gets to be outside all of the time. "I can't imagine working in a factory or sitting in a cubicle."

Ison, one of seven linemen employed by the co-op, works on the L'Anse-based crew which is also where he resides with his wife, Sarah. In his spare time the self-described "car fanatic" enjoys the reward of restoring cars and bringing them back to their original glory. "I love classic cars. So many of them are like a work of art."

The same dedication he puts into car restoration apparently carries over into his work. Ontonagon's line supervisor, Bill Tucker, says of Ison, "Dony is a fun to be around. He is always upbeat and very positive. Just this week he had to dig up an underground secondary that had faulted. It was one of the few 90 degree days with high humidity that Yoopers don't deserve. Even after he found out that the fault was caused by the member installing a fence without calling Miss Dig, he was still laughing. Dony is active in his community by serving as a volunteer fireman. He and his wife enjoy traveling when they get a chance and I would not be surprised if he decides to participate in the NRECA International Program sometime in the future."

Ison is just one of the Ontonagon co-op's dedicated team of employees that works for you, the members, striving to provide you with reliable and cost-effective power every day. ■

“It's been the best decision I ever made.” A sentiment he says is largely due to the fact that he gets to be outside all of the time. “I can't imagine working in a factory or sitting in a cubicle.”

PORTABLE GENERATOR SAFETY TIPS



Always read the Owner's Manual and instructions for your generator. Do NOT cut corners when it comes to safety.

These tips are merely supplemental and are not intended to substitute reading of the Owner's Manual.

Carbon Monoxide and Ventilation

- Using a generator indoors CAN KILL YOU IN MINUTES. Exhaust contains carbon monoxide, a deadly poison gas you cannot see or smell.
- NEVER run a generator indoors or in partly enclosed areas, such as garages.
- ONLY use outdoors and far from windows, doors, vents, crawl spaces and in an area where adequate ventilation is available and will not accumulate deadly exhaust gas.
- Using a fan or opening doors and windows will not provide sufficient ventilation.
- It is recommended that you install battery operated carbon monoxide alarms/detectors indoors according to manufacturer's instructions/recommendations.

Gasoline, Fueling and Burn Safety

- If tank is over-filled, fuel can overflow onto a hot engine and cause fire or explosion.
- Do not overfill the fuel tank. Always allow room for fuel expansion.
- Never add fuel while unit is running or hot. Allow generator and engine to cool entirely before adding fuel.
- Never store a generator with fuel in the tank where gasoline vapors might reach an open flame, spark or pilot light.
- Many generator parts are hot enough to burn you during operation and while the generator is cooling after turning off. Avoid coming into contact with a hot generator.

Electrocution Hazard and Electrical Shock Hazards

- Connecting a portable electric generator directly to your household wiring can be deadly to you and others. A generator that is directly connected to your home's wiring can "back feed" onto the power lines connected to your home and injure neighbors or utility workers.
- Do not connect your generator directly to your home's wiring or into a regular household outlet.
- Always start or stop the generator only when no electrical loads are connected.
- Overloading your generator can seriously damage your valuable appliances and electronics. Do not overload the generator. Do not operate more appliances and equipment than the output rating of the generator. Prioritize your needs. A portable electric generator should be used only when necessary, and only to power essential equipment.
- Use the proper power cords. Plug individual appliances into the generator using heavy-duty, outdoor-rated cords with a wire gauge adequate for the appliance load. Overloaded cords can cause fires or equipment damage. Do not use extension cords with exposed wires or worn shielding.
- Do not operate the generator in wet conditions such as rain or snow.
- The generator must be properly grounded. If the generator is not grounded, you run the risk of electrocution. Check and adhere to all applicable federal, state and local regulations relating to grounding.

Generator Placement and Operation

- Allow at least five feet of clearance on all sides of the generator when operating.
- Generators can be used during a wide variety of weather temperatures, but should be protected from the elements when not in use to prevent shorting and rusting.
- Operate the generator only on level surfaces and where it will not be exposed to excessive moisture, dirt, dust or corrosive vapors.
- Inspect the generator regularly.
- Always disconnect the spark plug wire and place the wire where it cannot contact the spark plug to prevent accidental starting when setting up, transporting, adjusting or making repairs to the generator.

Source: American Red Cross with technical advice from the Centers for Disease Control and Prevention, the National Fire Protection Association (publisher of the National Electric Code®) and the U.S. Consumer Product Safety Commission. ■



Maintain Your Home's Heating System Efficiency

By James Dullely

With the heating season soon upon us, make sure your heating system is running at its maximum efficiency. Doing a simple heating system tune-up yourself improves its efficiency, resulting in significant annual cost savings.

However, don't skip your regular professional maintenance calls just because you have done your own heating system mini-tune-up. There are many areas within a heating system that only a qualified technician can evaluate and adjust properly.

The first items to check are for safety. With a gas or propane furnace, put several drops of soapy water on any gas-line fittings you find. If the water bubbles at all, there are leaks. Leave your house *immediately* and call your gas company to have it repaired. With a heat pump, check to make sure the insulation on all of the external wiring looks correct. You can inspect potential 'bad spots'—damaged or frayed areas—more carefully once you turn the circuit breaker off.

Turn off the electric power to the heating unit at the circuit breaker panel. Remove its side cover to gain access to the blower. Using a vacuum cleaner brush attachment, clean any dust deposits off the blower. You may find bearing oil cups on the blower motor of older systems. Put a drop of oil in each cup.

Find the fan control switch and adjust the temperature setting lower. Common settings are on at 135 degrees and off at 100 degrees. Try using 110 and 90 degrees. This starts the blower sooner and

keeps it running longer as the heat exchanger heats up and then cools down.

Replace the cover and make sure all the cabinet screws are tight. Also, check the tightness of any cabinet screws you can find. Having the cabinet well-sealed improves efficiency by maintaining the proper air flow through the coils or over the heat exchanger surfaces. With a heat pump, also check the cabinet screws on the outdoor condenser unit.

Set up the thermostat so the furnace starts. Hold a stick of lighted incense near all the joints in the ductwork, both return and supply air ducts, to check for air leaks. If you find leaks, wipe dust off the surfaces and use mastic (a gooey, non-hardening material) around the leaking joints.

This is a good time to change your furnace filter or clean a central air cleaner element. Consider installing a more effective filter element than the low-cost fiberglass ones that many systems use. This may not help indoor air quality much, but it can keep the air-flow paths cleaner for more efficient heat transfer.

Check the accuracy of the wall thermostat. You may actually be keeping your house warmer than you realize. Tape a bulb thermometer on the wall next to your furnace. Check the thermometer reading when the furnace shuts off and note the difference between it and the thermostat setting. Now you will know where to set the thermostat to get the indoor temperature you desire. If it is inaccurate, replace it with a new electronic setback model. ■



SEAFOOD FAVORITES

Flavorful seafood recipes you will love!

Lobster Mac & Cheese

Doreen Zuznis, Clio

- kosher salt
- vegetable oil
- 1 lb. cavatappi (tubed corkscrew pasta)
- 1 qt. milk
- 8 T. (1 stick) unsalted butter, divided
- ½ c. all-purpose flour
- 12-oz. Gruyere cheese, grated (4 c.)
- 8-oz. extra-sharp cheddar, grated (2 c.)
- ½ t. freshly ground black pepper
- ½ t. nutmeg
- 1½ lb. cooked lobster meat (langostinos)

Preheat oven to 375°. Drizzle oil into a large pot of boiling salted water. Add pasta and cook according to the directions on the package, 6 to 8 minutes. Drain well. Meanwhile, heat the milk in a small saucepan, but don't boil it. In a large pot, melt 6 T. of butter and add the flour. Cook over low heat for 2 minutes, stirring with a whisk. Still whisking, add the hot milk and cook for a minute or two more, until thickened and smooth. Turn off the heat, add the Gruyere, Cheddar, 1 T. salt, the pepper, and nutmeg. Add the cooked macaroni and lobster meat and stir well. Place the mixture in a large casserole dish. Melt the remaining 2 T. of butter, combine them with the fresh bread crumbs, and sprinkle on the top. Bake for 30 to 35 minutes, or until the sauce is bubbly and the macaroni is browned on the top.



Crab Casserole

Virginia Rubingh, Ellsworth

- ½ lb. fresh/frozen crab meat
- ½ c. sour cream
- 1 T. lemon juice
- pinch garlic salt
- 1¼ c. cheddar cheese, divided
- 8-oz. pkg. cream cheese, softened
- 2 T. Hellman's® mayonnaise
- 1¼ t. Worcestershire® sauce
- 1 T. milk

Mix all ingredients together in a casserole dish. Sprinkle half of the cheddar cheese on top. Bake at 325° for 25–30 minutes.

Seafood Pasta Salad

Betty Poradek, Stephenson

- 8-oz. pkg. imitation crab meat, cut up
- 8-oz. bag frozen mini shrimp, thawed (optional)
- ½ cup chopped celery
- 1–2 T. chopped green onion (including some tops)
- 1 can water chestnuts, chopped
- 8-oz. frozen peas, thawed
- 1 lb. bag rotini noodles, cooked
- dash dill weed
- 1½ c. Miracle Whip®
- 8-oz. sour cream

Mix all pasta together and chill for several hours. Keeps up to three days in fridge.

Dilly Fish

Gertrude Romanchuk, Traverse City

- fresh pan fish
- dill pickle juice
- instant potato flakes
- peanut oil

Wash fish and dry well with paper towels. Soak fish in dill pickle juice for 15–30 minutes. Roll in potato flakes and fry in peanut oil, turning once. Fry until golden brown. Very tasty!

SUBMIT YOUR RECIPE!

Thanks to all who send in recipes. Please send in your favorite "Easy Chicken" recipes by **Sept. 10**, "Chili" recipes by **Nov. 1** and "Gluten Free" recipes by **Dec. 1**.

Enter your recipe online at countrylines.com or send to (handprinted or typed on one side, please): *Country Lines* Recipes, 201 Townsend St., Suite 900, Lansing, MI 48933. Please note the co-op from which you receive your electric service.

Contributors whose recipes we print in 2015 will be entered in a drawing and *Country Lines* will pay the winner's January 2016 electric bill (up to \$200)!

Dill Shrimp Salad (pictured)

Mary Babcock, Port Austin

- 4 c. cooked small shells or penne pasta
- 1 lb. cooked fresh shrimp, diced
- 1 c. frozen peas
- 1 c. small diced celery
- ½ c. chopped green onions, including tops
- ¼ c. minced fresh parsley
- 10 oz. plain Greek yogurt
- 1 c. mayonnaise
- ¼ c. fresh lemon juice
- 2 T. snipped fresh dill
- ½ t. salt
- ¼ t. white pepper

In a large bowl combine pasta, tuna, celery, onions, peas and parsley. In a small bowl combine yogurt, mayonnaise, lemon juice, dill, salt and pepper. Pour sauce over pasta, toss gently. Cover and refrigerate at least two hours. Serves 10.



STATE OF MICHIGAN

BEFORE THE MICHIGAN PUBLIC SERVICE COMMISSION

Case No. U-17784

In the matter on the Commission's own motion, regarding the regulatory reviews, revisions, determinations, and/or approvals necessary for Ontonagon County Rural Electrification Association to fully comply with Public Act 295 of 2008.

NOTICE OF OPPORTUNITY TO COMMENT

On November 24, 2014, in Case No. U-17770 et al, the Michigan Public Service Commission (Commission) ordered Ontonagon County Rural Electrification Association to file an Energy Optimization (EO) Plan on or before August 1, 2015 to comply with the "Clean, Renewable and Efficient Energy Act" (2008 PA 295, MCL 460.1001, et seq.). Because August 1, 2015 fell on a Saturday, Ontonagon County Rural Electrification Association was allowed to extend the filing deadline to August 3, 2015. On August 3, 2015, Ontonagon County Rural Electrification Association filed its Energy Optimization Plan with the Commission.

Any interested person may review the filed Energy Optimization Plan on the MPSC website under Case No. U-17784 at: www.michigan.gov/mpscedockets, or at the office of the Commission's Executive Secretary, 7109 West Saginaw, Lansing, Michigan, between the hours of 8:00 a.m. and 12:00 p.m. and 1:00 p.m. and 5:00 p.m., Monday through Friday, or at the offices of Ontonagon County Rural Electrification Association, 500 James K. Paul Street, Ontonagon, Michigan.

Written and electronic comments may be filed with the Commission and must be received no later than 5:00 p.m. on October 5, 2015. Written comments should be sent to the: Executive Secretary, Michigan Public Service Commission, P.O. Box 30221, Lansing, Michigan 48909, with a copy mailed to: Ontonagon County Rural Electrification Association, 500 James K. Paul Street, Ontonagon, Michigan 49953. Electronic comments may be e-mailed to: mpscedockets@michigan.gov. All comments should reference Case No. U-17784. Comments received in this matter become public information, posted on the Commission's website, and subject to disclosure. Please do not include information you wish to remain private.

The Commission will review the energy optimization plan together with any filed comments and provide a response within 60 days of the filing of the application indicating any revisions that should be made. If the Commission suggests revisions, the Cooperative will file a revised EO plan no later than 75 days after the filing of the application. A Commission order will be issued on or before the 90th day following the filing of the application.

POP QUIZ

ENERGY USERS

Can you rank the following appliances based on energy use?

1 = uses the most energy

4 = uses the least energy

- Refrigerator
- Clothes washer
- Microwave
- Hair dryer

Answers: 1. Refrigerator 2. Microwave 3. Clothes washer 4. Hair dryer

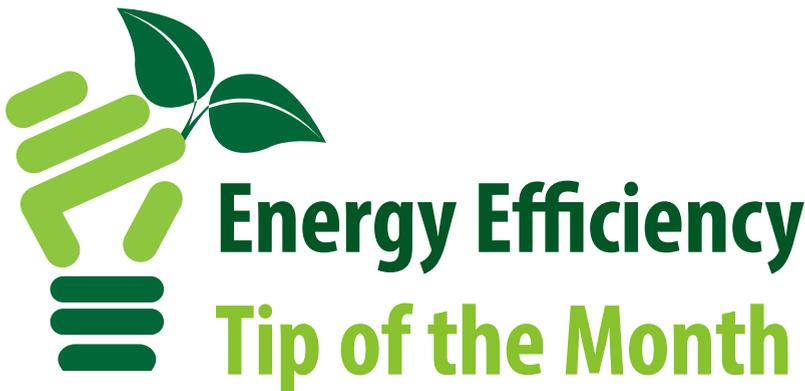
Source: energy.gov

Public Act 295: The Clean Renewable and Efficient Energy Act

2014 Annual Energy Optimization Report Ontonagon County Rural Electrification Association MPSC Case Number U-17371

Ontonagon County REA contracted with the Michigan Electric Cooperative Association (MECA) to administer the Energy Optimization efforts in order to comply with PA-295. MECA filed a 4-year Energy Optimization plan with the MPSC on Aug. 1, 2011, as required by PA 295. This EO plan was approved by the MPSC on Nov. 10, 2011, and we began implementing the plan Jan. 1, 2012. The Wisconsin Energy Conservation Corporation (WECC) was selected to implement all Residential, Commercial, and Industrial Programs, and the Energy Optimization website michigan-energy.org. WECC has subcontracted with JACO, Michigan Energy Options, Franklin Energy, Morgan Marketing Partners, and Honeywell to assist with the implementation of the EO Programs. MECA contracted with KEMA as the independent 3rd party evaluation contractor for the certification of kWh savings.

In 2014, Ontonagon County REA collected \$68,338 through the Energy Optimization Surcharge and spent \$43,648 resulting in an over-collection of \$24,690 which will be applied towards the 2015 EO Program delivery expenses and goal achievement. Ontonagon County REA achieved 182 MWh of energy savings in 2014. For every dollar spent on energy efficiency programs, customers will save \$3.61 in avoided energy costs. The full report can be obtained at michigan-energy.org or <http://efile.mpsc.state.mi.us/efile>.



Periodically inspect your dryer vent to ensure it is not blocked. This will save energy and may prevent a fire. Manufacturers recommend using rigid venting material—not plastic vents that may collapse and cause blockages.

Source: energy.gov

Fuel Mix Report

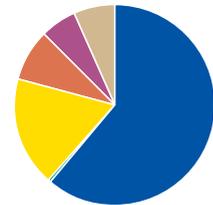
The fuel mix characteristics of Ontonagon County REA as required by Public Act 141 of 2000 for the 12-month period ended 6/30/15.

COMPARISON OF FUEL SOURCES USED

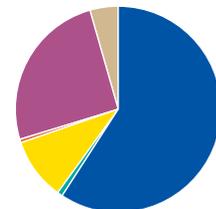
Regional average fuel mix used		
Your co-op's fuel mix		
FUEL SOURCE		
Coal	61.27%	60.4%
Oil	0.21%	0.7%
Gas	17.94%	8.9%
Hydroelectric	8.24%	0.54%
Nuclear	5.78%	24.6%
Renewable Fuels	6.56%	4.87%
Biofuel	0.16%	0.69%
Biomass	0.94%	0.40%
Solar	0.01%	0.04%
Solid Waste Incineration	1.64%	0.05%
Wind	3.68%	3.17%
Wood	0.12%	0.5%

NOTE: Biomass above excludes wood; solid waste incineration includes landfill gas.

Your Co-op's Fuel Mix



Regional Average Fuel Mix



EMISSIONS AND WASTE COMPARISON

TYPE OF EMISSION/WASTE	lbs/MWh	
	Your Co-op	Regional Average*
Sulfur Dioxide	0.67	7.6
Carbon Dioxide	1,480	2,170
Oxides of Nitrogen	0.64	2.0
High-level Nuclear Waste	0	0.0083

*Regional average information was obtained from MPSC website and is for the twelve-month period ending 12/31/14.

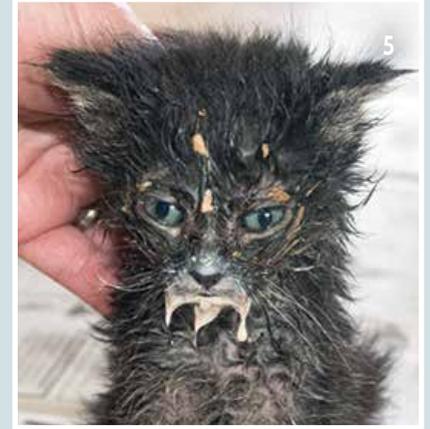
Figures for Ontonagon County REA are based on those of its principle power suppliers, WPS and WE Energies.

1



2

1. Recent OCAP resident Teddy. Just one of the cats available for adoption.
2. OCAP cat coordinator Janet Wolfe pictured with Whitley and Gretchen in the cat room at the shelter.
3. OCAP shelter cats are very intelligent as is evidenced here as three of them use an ipad.
4. OCAP dog coordinator Anne Lundberg and her daughter, Maisey Pollard, pictured with Ky, a 4-year-old shepherd mix who is searching for his forever home.
5. Three-week-old Lucca, learning how to eat from a dish. This is what taking care of tiny kittens looks like.



It Takes a Village

By Yvonne Whitman

The heart of a small community is usually the people who live in it, and in the case of Ontonagon County Animal Protection (OCAP), it is evident that the community has a large and generous heart. The all-volunteer organization currently operates a no-kill shelter in the village of Ontonagon that provides a clean and safe environment for up to 20 cats and 12 dogs waiting for their “forever homes.”

Prior to 2010, however, things were different. “Cats were kept in a shed located downtown on a benefactor’s property, and dogs were housed in another shed at someone else’s house.” explains OCAP President Dot Phillips. In 2007, work began on the current shelter using capital from fundraisers, donations, and a bank loan. Labor was provided largely by volunteers who donated their time and energy to the project. In 2008, county residents approved a millage, providing three years of stable funding for the shelter. In 2010, the shelter opened. In 2013, another millage passed that is providing funding for four years. The millage income, along with memberships, donations and fundraisers, helps to pay for utilities, shelter maintenance, food, and veterinary services for Ontonagon’s domestic animals in need of care and a home.

Janet Wolfe started volunteering at the shelter in 2008. The retired UPPCO community relations leader, currently the cat coordinator for the shelter, recognizes what the support of the community means to the animals. “We’re very fortunate that Ontonagon County residents agreed to another millage. We could not do what we do without their support.” Help also

comes from many other quarters—in 2014, OCAP received an anonymous grant to put up a double fence around the dog yard, giving the dogs a secure area in which to run, play and exercise.

The shelter is always looking for foster families who can care for animals that cannot be placed in the shelter. It could be a nursing mother that needs a quiet place to raise her newborns or an injured, old, or special-needs animal that requires one-on-one attention. It could also be that the shelter is full, and they need somewhere for an animal to live until a spot opens up. A prime example of what a foster family can mean to a needy animal can be seen in what they called “the chocolate kittens.” Six tiny tabby kittens were found by a local farmer between two bales of hay in a barn. When the mother cat didn’t return, OCAP took them. Because neonates need to be kept warm until they’re old enough to regulate their own body temperatures, and because they need to eat many times a day, it was very difficult to care for them properly in a shelter without round-the-clock staffing. The kittens went to an experienced local foster mom who raised them to be confident, sociable pets that all found loving homes. “Foster families willing to put in this kind of time and love are so important to the success of shelters. The support we receive is why we think of ourselves as a community shelter. It really does take a village—or in our case, a county—to do what we do.” Wolfe says.

To learn more about the shelter or find out how you can help, contact OCAP president Dot Phillips at 906-869-9291 or by email at ddodobird@aol.com. ■

SUNKEN TREASURE

THUNDER BAY NATIONAL MARINE SANCTUARY

By Emily Haines

The eerie romance of a shipwreck is something that seems saved for epic adventure novels or blockbuster Hollywood movies. But just off the coast of Lake Huron, near unassuming Alpena, MI—is one of the most treacherous stretches of water in the Great Lakes—a place called Thunder Bay.

If the name itself sounds ominous, it's because Thunder Bay offers up unpredictable shifts in weather, alarming gales, fog banks and notoriously rocky shoals that play ghostly host to an area fittingly called—Shipwreck Alley. There lies the remains of over 200 ships, only about 100 that have been physically discovered. While it's difficult to imagine the friendly beaches of the Great Lakes as anything but welcoming, these deep and traitorous waters were once bustling byways for both recreational and business mariners, not all that ended at their intended destination.

"It's easy to stay motivated and excited in your work when you're dealing with such a robust historical landscape," said Stephanie Gandulla, maritime archeologist and media coordinator for Thunder Bay National Marine Sanctuary. "There are so many stories lying just below the surface of the Great Lakes."

Those stories just increased substantially as the marine sanctuary has grown from 448 square miles to a remarkable 4,300 miles as of last September. This means expanding both research and educational programs as well as a multi-year plan to "characterize" every known shipwreck in the sanctuary. Characterizing can mean a variety of informational components including having a site map, photography, data and sonar images, or even knowing the name and vessel information.

"It's no wonder our student programs appeal to our younger visitors," said Gandulla. "You don't have to be able to scuba dive 300 feet to have an interaction with maritime history. We provide and encourage hands-on experiences both in and on the water."

The experiences are anything from a class trip to the sanctuary's impressive Visitor's Center, with over 10,000 feet of exhibits, participating in a program on shipwreck archeology, or building underwater robotics. There are also glass bottom boat tours that allow visitors to view shipwrecks without ever getting their feet wet. Gandulla says it's not uncommon for students who have had a field trip in elementary or high school or invested themselves in a Shipwreck Alley class to later become a volunteer as an adult.



Twisted hull of the German freighter Nordmeer (1954-1966).



The bow of the schooner E.B. Allen (1864–1871).



The Florida (1889–1897) still sits upright with its package freight still inside.

While all of this is available in our state's backyard, people from around the world come to marvel at these maritime catacombs, as well.

"Beyond the rich and special maritime history of this area, it's also a remarkable place to vacation," said Gandulla. "We have world class recreational opportunities available to us in Michigan and we feel very strongly about sharing them with people from around the globe." ■



The Monohansett, lies only 18 feet below the water's surface.

Visit

If you're interested in a trip to the Visitor's Center, visit thunderbay.noaa.gov/visit. Or, to book a glass bottom boat tour go to alpenashipwrecktours.com/. For more information call 989-356-8805.

Project Shiphunt

On July 13, 2011, the Thunder Bay National Marine Sanctuary (NMS) announced the discovery of two Great Lakes shipwrecks. The discoveries were part of Project Shiphunt, an exciting archaeological expedition, sponsored by Sony and the Intel Corp, that included five high school students from Saginaw. For more on the project, visit thunderbay.noaa.gov/shiphunt.html

Monohansett Site

For a sneak peek at the kind of discoveries you can expect, take a look at the Monohansett, a ship wrecked in 1907 that lies in three sections just 18 feet below water. thunderbay.noaa.gov/shipwrecks/monohansett.html

Photo below: With the hull broken just forward of the boiler house and the ship listing hard to port, the wreck of the Norman, which claimed the lives of three sailors, is an intense dive experience.

Photos by NOAA, Thunder Bay NMS

TITANS OF

TECHNOLOGY



Over three decades ago, Lake Superior State University (LSSU), Sault Ste. Marie, established the first bachelor's degree in robotics in the nation. The program was created as the combined result of both a state grant and a visionary department chair that recognized the opportunity of getting in on the ground floor of emerging technology. Since then, robotics education and training at LSSU have evolved into a concentration for students in mechanical, electrical and computer engineering degrees, and as a robotics minor for students in the manufacturing and electrical engineering technology degrees. This robotics concentration (or minor) continues to be unique with only a handful of public universities in the nation offering such an option for undergraduate students.

"Through our training, our graduates can design and implement robotic processes for the manufacturing industry that will help to keep jobs here in the United States, and by using automation, keep it competitive

from the transfer of labor to outside of the U.S.," explains LSSU Professor Jim Devaprasad.

According to a July 2014 article in the *Washington Post*, industrial robots have advanced to the point at which they can do the same physical work as human beings. The operating cost of some robots is now less than the salary of an average Chinese worker. The more processes that can be automated, the less it makes sense to outsource activities to countries where labor is less expensive. For example, Foxconn, the world's largest contract electronics manufacturer, best known for manufacturing the iPhone®, recently announced it will spend \$40 million at a new factory in Pennsylvania, using advanced robots and creating 500 jobs.

With over \$1.5 million in state-of-the-art industrial robotics at their disposal, it is no surprise that LSSU engineering graduates in this field typically secure good full-time jobs well before graduation. Careers are typically in the design and implementation of innovative automation solutions for the

By Yvonne Whitman



LSSU Prof. Jim Devaprasad goes through the steps of the Stäubli work cell with summer robotics camp staff members Trace Hill (mech. eng), background, and Brittany Wallo (computer science), foreground. The workcell, comprised of 4 Stäubli robots, 3 shared rotary index tables, and a Bosch conveyor system, assembles and disassembles model zambonis. Witness software is used to program the procedure.

LSSU photo/John Shibley.

Professor Devaprasad with members of recent LSSU senior project teams Automation Innovation Renovation (AIR) and Precision Automated Systems (PAS).

LSSU photo/John Shibley.



LSSU students Patrick Davis (seated) and Trace Hill demonstrating the FANUC LR-Automate 'grocery bagging' robot. A Cognex vision sensor takes a picture of the object. Once the shape is recognized, the system determines the best way to attempt to pick up the item. The robot picks up the item and places it into a grocery bag using an articulated suction gripper developed by the team.

Photo—Yvonne Whitman.

Professor Jim Devaprasad, Coordinator of Manufacturing Engineering Technology at LSSU.

LSSU photo/John Shibley.

manufacturing industry. Companies that have hired LSSU graduates include Ford, GM, Boeing, FANUC and Kawasaki. According to Devaprasad, companies arrive on LSSU's campus in the fall seeking students that will graduate the following spring. Each graduating student typically receives two or three job offers with starting salaries averaging about \$60,000. "There are more job opportunities and positions to fill than we have graduates for," says Devaprasad. "We would welcome and love to educate many more motivated, incoming students."

With a curriculum heavily weighted in math and science, incoming students typically display an aptitude in these areas. But there is also the factor that cannot be defined, but is best personified by a statement from Patrick Davis, an LSSU senior engineering student from Chicago, IL. "When I was five years old my parents bought me a LEGO® Mind Storm kit and I just sort of never stopped." Fast forwarding 17 years, "I just applied to graduate school and my ultimate goal now is to work in the field of nanoelectronics."

The LSSU robotics staff and students also take their knowledge and skills into the Cloverland Electric Cooperative community by serving as mentors for local high school First Robotics Competition (FRC) teams in Rudyard, Brimley and the Sault Area Schools. FRC, the varsity Sport for the Mind™, combines the excitement of sport with the rigors of science and technology. Under strict rules, teams of students are challenged to build and program robots to perform prescribed tasks against a field of competitors. It's as close to "real-world engineering" as a student can get, and volunteer professional mentors who lend their time, talents and guidance are critical to a team's success.

For over 30 years, LSSU has led the pack in the robotics field and plans to continue leading well into the future. Contact Jim Devaprasad at jdevaprasad@lssu.edu or call 906-635-2131 for more information. ■

Communicating in the Age of the Emoji

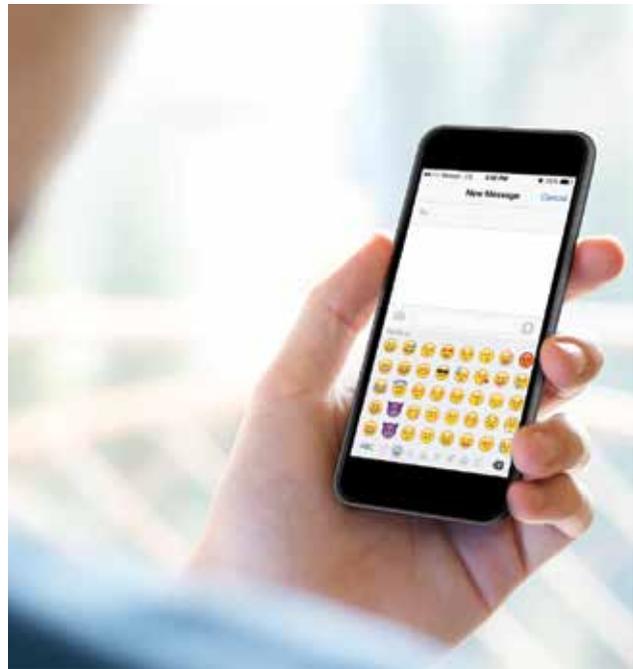
By Jack O'Malley

A few years ago my son stood before a display of old rotary phones in an antique store, puzzled by the seemingly ancient devices. "How did people text with those?" he asked. I chuckled before the thought occurred to me. An entire generation now exists who've never known life without mobile phones, text messages, Google or social media.

In today's world of technology a new digital language based on acronyms and emojis has emerged, allowing people to communicate instantly with little more than a few letters and characters. In the old days, we huddled around the handset during a long-distance call, everyone listening and talking at the same time because the calls were too expensive for everyone to have a separate turn talking. I guess I'm officially an old fogie! LOL

Mobile phones have become such an essential part of our lives, we have a hard time functioning without one. Like an extra appendage, we rely on a cell's convenience, intelligence and sheer ability to do almost anything. Want to play Scrabble? Download the app. Want to enhance a photo? Download an app. Want to check Facebook? Download the app. Want to shop? Download an app. There are apps (short for "applications," programs designed specifically for use on portable devices) for everything. Just ask my wife. She'll tell you. SMH (that's **s**haking **m**y **h**ead for all you rookies out there.)

Our reliance on digital technology can only be ascertained when we forget our cell. Ever reached for your phone to make a quick call or send a text



only to realize you left your cell on the charger at home? Panic ensues. I've actually broken into a sweat and driven an hour round trip just to have my phone on hand! :)



Jack O'Malley

Times have sure changed since I was a lad. These kids might run circles around me when it comes to their smart phones, but I had something they didn't. The most popular rotary phone ever made, an original Fisher-Price Chatter Telephone toy. And let me tell you, it was GR8! ■



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