

CAREER CURRENTS

Waterway Transportation Helps Move the Fuels That Power America

"Rollin' on the River" may be memorable words in the chorus of Creedence Clearwater Revival's hit song "Proud Mary," but it's also a good description of one of the most widely used and environmentally friendly ways of transporting fuels like coal and petroleum around the country on America's waterways.

If you'd like to be a part of this energy transportation system, there are dozens of different types of jobs ranging from management work in an office to being a deckhand on one of the boats. These jobs offer a variety of opportunities to help

plan and manage the barges and tankers as a dispatcher, fleet manager or logistics specialist, or working onboard as a captain, engineer, cook or in another hands-on capacity.



A hypothetical case study by the Texas Transportation Institute estimated that a shutdown of the Mississippi and Illinois Rivers near St. Louis would shift millions of tons of cargo from the river system and increase truck traffic on St. Louis roads by 200% and traffic delays by 500%, and more than double the cost of highway improvements over 10 years. Photo courtesy of the National Waterways Foundation.

It's no coincidence that many of America's (and the world's) major cities are located on waterways since it is often the availability of an inland waterway that makes it possible for commodities for food, power and other needs to be delivered from far distances. The Waterways Council, Inc., notes that our country's first president, George Washington, developed a map of proposed roads and canals that could connect the country. In the years that followed, a number of government officials recommended additional plans to use dikes and dams to deepen channels to make them more navigable, along with other suggestions for linking America's developing cities via a waterway system.

Probably the most significant event in creating an inland waterway system in the U.S. was President Thomas Jefferson's decision to send two young explorers named Meriwether Lewis and William Clark on the country's first

overland expedition to the Pacific coast, beginning in 1803. In a letter he wrote to them, the President said that the purpose of their mission was to explore the Missouri River and other waterways that would connect with the waters of the Pacific Ocean, including the Columbia, Oregon, Colorado or any other river that might "offer the most direct & practicable water communication across this continent for the purposes of commerce."

Thanks to the foresight of leaders like Washington and Jefferson and the work of pioneers like Lewis and Clark and many more explorers who followed after them, our country has a navigable inland waterway system that stretches more than 12,000 miles and links 38 states (primarily in the country's heartland and Pacific Northwest), making rivers the main thoroughfare of commerce in the U.S. Several of the country's largest ports are located on inland waterways, including New Orleans, St. Louis, Pittsburgh, Stockton (California) and Portland (Oregon).

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The National Waterways Conference explains that in addition to the rivers and ports, the waterway system includes related infrastructure such as locks and dams, navigation channels, harbor improvements, and flood prevention structures like dams, levees, and riverbank protection.

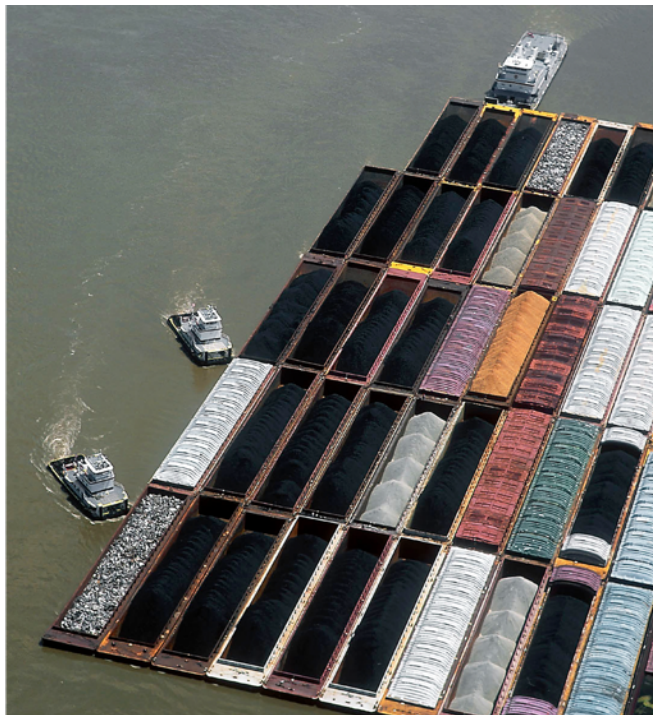
Transporting Coal

While this waterway system brings a wide variety of cargo like food, steel and other bulk commodities to many of our nation's ports and cities, one of its major impacts is on America's energy supply.

Consider the use of coal as a source of electricity. Though nearly half the states don't actively mine coal, they all need it. The U.S. Department of Energy estimates that about 92 percent of the coal used in the country is for generating electricity. That coal produces nearly half of America's electricity. Utility companies, industries and businesses around the country have power plants that burn coal to produce steam, driving turbines to generate electricity.

About one billion tons of coal are transported around the U.S. every year. Much of this goes to states that do not mine any of their own coal, while the rest delivers specific types of coal that may be needed far from where it is mined (for example, special coal is used to make steel, and some parts of the country require low-sulfur content coal to reduce sulfur dioxide emissions).

About 20 percent of the coal used to generate electricity in the U.S. is delivered by boat and produces 10 percent of all electricity used in the country every year. The American Coal Foundation explains that large volumes of coal are difficult to transport because of their heavy weight, so railways and rivers are the best options for transportation methods. While trucks are also used, they just can't carry enough coal each load to make it cost-effective. As a result, highways are typically used only for coal transportation of 50 miles or less. And even though it is cheaper to deliver coal by boat than by train, much more coal is transported over the rails because barges can't reach all locations where the coal is needed.



America's waterway fleet of almost 4,000 tugboats and towboats and more than 27,000 barges moves more than 800 million tons of cargo every year. Photo by Gregory Thorp.

Transporting Petroleum

About 22 percent of our domestic petroleum and petroleum products is transported by water. Tank barges are well-built, have an excellent safety record, and feature redundant systems to withstand extreme circumstances such as severe storms. They also use few natural resources.

One of the biggest benefits of tank barge transportation is they can carry petroleum and other fuels without adding to traffic congestion on the nation's highways. For the past 15 years, tank barges have moved an average of approximately 69 billion gallons of petroleum and petroleum products annually.

Benefits of Waterway Transportation

There are several major benefits of waterway transportation usually noted when comparing barges and tank barges to trucks and trains, including:

- One jumbo barge has the same capacity as 16 railroad cars or 70 trucks. One gallon of fuel used to power that barge can move one ton of cargo 576 miles, as compared to a gallon of fuel moving the same-sized load 413 miles by train or 155 miles by truck. Barges can also carry cargoes that are too large to fit into train cars or trucks.

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Spotlight on ...

RiverWorks Discovery

RiverWorks Discovery^(R), a Journey of Exploration and Imagination on America's Waterways, is a free, hands-on, trademarked educational program. RWD is designed to teach children and their families about the commerce, culture and conservation issues surrounding the great rivers and their watersheds.

The developers responded to the need for a fun but comprehensive educational overview of the rivers and their multiple roles in American life, targeted for children ages 8-12. RWD includes free multi-disciplinary outdoor programs, river-specific and nation-wide logbooks, activity sheets, and a patch program.

Since 2004, the program has reached more than 200,000 individuals through festivals, conferences, presentations to students, and hands-on workshops. Lessons on the great rivers and their watersheds include commerce (transporting goods used every day, helping our nation's economy), culture (how rivers and river trade have shaped history and inspired music, literature, and art; the underground railroad; settlements), and conservation (shipping supports clean water and healthy habitats; is the safest, cleanest, greenest and most energy efficient choice for transporting bulk goods).

All program elements are free and downloadable from the web. The web site is a distribution tool, not an entertainment destination. The goal is to get kids outside! For more about the RiverWorks Discovery program, visit www.riverworksdiscovery.org.

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Career Currents provides educators and students with resources to introduce energy careers. Each issue focuses on a different sector of the energy industry. No single issue is meant to be all-inclusive to either the sector profiled or all careers in energy.

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- EPA has estimated that one-third of the country's annual carbon dioxide emissions comes from transport-related activity. Using less fuel-per-ton-mile (how many miles one ton of product is moved using only one gallon of fuel) and emitting fewer hydrocarbons, particulate matter, carbon monoxide and nitrous oxide per ton-mile make barges a better transportation choice than trucks or trains from an environmental standpoint.
- Barges have a better safety record than trucks or trains, with fewer accidents and deaths. Using the waterways keeps trucks off the highways and reduces traffic accidents.

The Future

The good news is that inland waterways are under-utilized in America, with some experts estimating that it is operating at only about a 40 percent capacity. There is a huge amount of unused capacity to meet the country's future transport needs, especially for bringing coal, petroleum and other fuels to locations needing them to produce power.

On the other hand, the industry is certain to undergo some change as many of the ports and waterways used today are in need of renovation. For example, more than half of the country's lock sites (devices that use gravity to raise and lower boats between stretches of water of different levels, making a river more easily navigable), which handle more than 630 million tons of freight every year, are more than 50 years old, putting them beyond their economic design lives. Unless these locks can continue to operate, the reduced use of the waterways will lead to cargo shifts to trains and trucks, resulting in more traffic on the roads, more fuel used, and an increase in pollutants into the air. Modernizing the waterways' infrastructure is a major need in the coming years, leading to even more opportunities for careers in the waterways field.



The inland waterways system includes 12,000 miles of commercially navigable channels and approximately 240 lock sites. Photo courtesy of the National Waterways Foundation.

Sources: National Waterways Foundation (www.nationalwaterwaysfoundation.org); Waterways Council, Inc. (www.waterwayscouncil.org); National Waterways Conference (www.waterways.org); American Waterways Operators (www.americanwaterways.com); American Petroleum Institute (www.api.org); U.S. Department of Energy, Energy Information Administration (www.eia.doe.gov); American Coal Foundation (www.teachcoal.org), and the Library of Congress (www.loc.gov).



Inland waterways in the U.S. transport about 22% of domestic petroleum and petroleum products and 20% of the coal used in electricity generation.

America's "inland marine highways" move commerce to and from 38 states throughout the nation's heartland and Pacific Northwest, serve industrial and agricultural centers, and facilitate imports and exports at gateway ports on the Gulf Coast.

Map graphic courtesy of the National Waterways Foundation/Howell Creative Group.

Q&A

Ginger Duncan, Ingram Barge Co.



Ginger Duncan is Manager of Training and Development for the marine group of Ingram Barge, the leading carrier of cargo on the country's waterways with nearly 4,000 barges and more than 1,800 employees in the marine division. Ginger has undergraduate degrees in education and psychology from the University of Massachusetts in Boston, and master's degrees in human services and in guidance and counseling from Murray State University.

Tell us a little about your job and what you do.

My office is responsible for all the training of the marine staff at Ingram. I coordinate training programs and manage the trainers in a variety of programs like leadership training, coaching and developing, supervisory skills and other specialized activities. Our work includes orientation for new hires, training on the computers on board our vessels, radar, crew endurance management systems, leadership training, and just about anything needed by the people working on the boats. One of our prime goals is to help our associates move up to higher positions, so we're constantly working with them to identify new career opportunities and help train them for these jobs.

How did you decide to go to work in this field?

I spent the first part of my working life teaching at all levels, actually from kindergarten through college, and I think my experience will show students how an education degree can take you to a lot of places you might not have thought about. My mother was a business consultant and I worked with her part-time, which got me moving in some new directions. I went to work for a community college in their business and industry department which is where I started my relationship with Ingram Barge Company. I've now been with them for five years full-time, and find I'm using all the skills and experience from my previous teaching and training jobs.

What technology have you used that has helped you the most in your work?

Computers are certainly an integral part of our toolkit. We do many presentations, video conferences and other programs where computers are absolutely essential. We even have a technology trainer on our staff who works with the crews of our vessels, helping them learn about the high-tech equipment that is so important to the performance and safety of their work.

What is a typical day at work like for you?

I spend a lot of time actually teaching in our training programs, of course, but when I'm back in the office, I am involved in researching classes for upcoming programs, planning for new courses, meeting with our staff, and doing other things to help

develop training activities. I also do a lot of one-on-one coaching with our employees which I enjoy a great deal. Because we teach in many different locations, I find I'm in a lot of different places and that keeps it exciting. We have a very active program – offering 15 or more classes every month, ranging in length from two days to one-week programs – so I'm involved in some aspect of training just about every day.

What is the most rewarding part of your job?

The coaching and development is something I really enjoy. For example, I'll be doing a lead man supervisory class tomorrow for people who are getting ready to be promoted to a supervisory position for the first time in their careers. I'll talk to them about goal-setting, what they might want to do long-term, and other aspects of career planning. I find many young people who work on our vessels took the job for the immediate opportunity, and they don't know very much about what they might be doing in just a few years to move upward in the company.

What advice would you give to a young person interested in energy who sees opportunities in the waterway industry?

First of all, I hope they see that our industry is an integral part of the energy field, as transportation by water is a critical element in getting energy fuels around the country -- for example, coal is the largest commodity that we ship. If someone likes the excitement and challenges of working in the marine industry, they need to consider their education plans beyond high school. Employees who come to work for us right out of school usually start out as deckhands and do many jobs on the boats and find out about all the different jobs on our vessels. Starting wages are pretty good, especially when you consider that they'll be working 28 days on the boat, then off for 28 days, so they actually work only six months a year. By the time they move up to the rank of mate, which might take around five years or so, they can make a very good salary, and can see good increases in salary as they move up even further. Obviously, it can be tough being away from home for 28 days at a time, but being on our vessels is really a lot like being with a family. The same crew typically works together. This industry offers a real future to young people. I've got two guys working in my office right now, for example, who started out as deckhands and now work as training specialists. If a student is interested in college, I urge them to pursue courses like logistics, or anything related to transportation. We've got a local community college in Paducah, Kentucky, that is just starting a new degree program in wheelhouse management, engineering, logistics and related topics. There are some other programs like this around the U.S. A good education can help a lot in higher-level job opportunities.

Q&A

Tommy Woosley, Crounse Corp.



Tommy Woosley is Manager of the Maysville (KY) Division of the Crounse Corp., a river transportation company whose service area includes the Ohio River and its connecting tributaries. After taking some college classes, he joined Crounse 23 years ago as a deckhand, was promoted to pilot in 1990, went into management in the traffic department in 1996, and was promoted to his current job in 2007.

Tell us a little about your job and what you do.

The division manager in our company wears several different hats. My basic duties are to oversee eleven line haul boats and two harbor boats, all properties in this division, and assist in sales and customer service.

How did you decide to go to work in this field?

I went to college for a while and decided that wasn't for me, so I went to work farming for my dad and it was a 7-day a week job. I had some friends who were working on the river and I really liked how much time they had off with the kind of schedules boats have. I talked to them and they really liked the work, so I applied and got a job as a deckhand. What an adventure! There's really nothing at all like work in the river industry. You get to see a lot of the country, but I guess the biggest obstacle to this kind of work is being gone from home for an extended period of time. These were what are called line haul boats, traveling from Pittsburgh to Paducah on the Ohio River as well as many other rivers, and they stay out for weeks at a time, unlike the harbor boats where the crew works 12-hour shifts but stay in the local area with no extended trips and they go home every night. Crews on line haul boats are out for 21 days at a time and travel to wherever they are needed for the most efficient movement of the barges.

What technology have you used that has helped you the most in your work?

When I first started in the mid-1980s, cell phones were not widely used. When you wanted to call home, you had to wait for a layover at a dock or hope you'd stop some place that had a phone like when you took on fuel or if there was a delay at a lock or other situation. It's a lot different today, and the crew members can keep in touch with their families and friends all the time.

What is a typical day at work like for you?

I wear so many hats that it's hard to think of a typical day. I usually start out by prioritizing what has to be done first.

For example, I've been working on a couple of projects but just got pulled off them to work with the Army Corps of Engineers on some permitting issues. We bought a piece of property on the river that had been used for unloading barges but has since been abandoned, and want to use it to fleet our barges, so there's a lot of work to get all this figured out. I also get involved working up rates for customers, reviewing costs on different items, and basically helping any customer who needs a problem resolved.

What is the most rewarding part of your job?

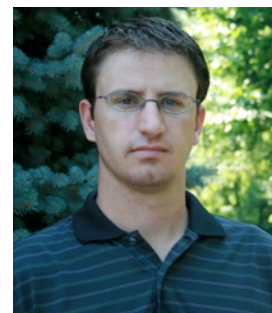
It feels great when I see people in our company get promoted. We recently had two deckhands who made their way up to pilot, and they worked pretty hard to get there. It's a nice feeling when you see the people who do more and do it better get to move up into more responsible positions.

What advice would you give to a young person who sees career opportunities in the river transportation industry?

In our industry the opportunity to move up the ranks is unlimited. It all depends on how hard you want to work. Starting jobs offer good pay, and most companies in our field have pretty good benefits, too. It can be a very rewarding career. I think this is a great field for someone who is interested in energy, since we play a very important role in the whole process of getting fuels like coal to the places where they need to be used. My company normally moves 30 million tons of product a year, with the majority of that being coal and some scrubber stone that we bring to utility plants that use coal. We have boats out on the river that will go from Pittsburgh down the entire length of the Ohio River to the Tennessee River and then connect with waterways taking them on to Mobile, Alabama, delivering coal to power plants all along the way. I'd tell a young person that a job like this can be a great one, and those three weeks working are pretty good but the three weeks off after them are absolutely terrific! Also, there are many other marine related jobs that do not require a person to be gone for extended periods. I would urge a young person not to cut their education short just to start their career a few years early. And by the way, there are women working in the industry, too. It's not all men. There are female pilots, female cooks, and I know a port captain who is a woman, so there are opportunities for everyone.

Q&A

Garrett Honaker, Crounse Corp.



Garrett Honaker is a towboat Captain with Crounse Corp. He has 10 years experience in the inland towing industry. Garrett started with Crounse Corp. seven years ago as a deckhand and has been a captain for the past year. He studied business management at Ohio University, and is working toward finishing his degree there.

Tell us a little about your job and what you do.

As a captain, I oversee the day-to-day operations on my vessel as I navigate it up and down the river. My job involves spending six hours, twice a day, navigating the boat, then I hand it over to the pilot who navigates it between my shifts. One of my key tasks is to oversee all activities to make sure that we are operating safely and efficiently. My responsibilities range from budget management to training. I work with my crew to perform various tasks related to our job. My vessel is a tow boat, 102-feet long by 26-feet wide, and capable of pushing 15 barges. When that many barges are attached, I'm navigating tows that stretch for more than 1,000 feet in length and are more than 100-feet wide, with well over 20,000 tons of cargo onboard. Though we carry all kinds of cargo, our number one commodity is coal.

How did you decide to go into this work?

I think that Mark Twain played a key part in attracting me to the river transportation field. When I was younger, I read his book *Life on the Mississippi* about his days as a steamboat pilot that made this life sound pretty romantic. As it turned out, it isn't quite as romantic as he made it out to be. There is actually a lot of hard work to get done. I grew up near a major river port where my brother-in-law works as a pilot, so seeing the opportunities that the river industry provided his family was another influence. There are a lot of great things about the job, though, but I like to describe it as a tough job being done by tough people. Because of the great history of riverboats in our country's development, we all take a lot of pride in what we do.

What technology have you used that has helped you most in your work?

Technology in general is becoming more and more a part of our lives in this industry. We have computers on board our vessels that let us send and receive emails from our company. We have computer-aided navigation, and some of the newer boats we're getting even have computers in the engine room monitoring fuel use and other activities.

What is a typical day at work like for you?

I come on watch for my first shift at 6 a.m. I talk with the pilot about his watch and he lets me know what is happening in the area we are transiting. I e-mail the daily log of activity to the office and pour a cup of coffee. I'll steer the vessel for the next six hours. During this time, we might be in a landing, assembling barges, picking up or dropping off barges, making a lock or steering a treacherous part of the river, and I'm taking input from the engineer on the condition of the vessel, talking with the cook about supplies, or basically gathering any other information that might affect what I am doing and what the pilot needs to know when he comes on watch after my shift.

What is the most rewarding part of your job?

Knowing that I am part of something bigger than myself. The tow industry keeps America going. Our contribution may be small, but it is not insignificant. If we stopped doing our jobs, people would notice.

What advice would you give to a young person who sees opportunities in the riverboat transportation industry?

I think anybody who is considering the industry should keep a positive attitude and be prepared to work very hard. There is a whole lot more to this field than just working on barges. If you are willing to work hard you can get ahead and move into a variety of other jobs. For example, there are people in shipyards building and repairing our vessels. Some work in design or fabrication or welding. A person can travel the world by working in the maritime industry. There are vessel jobs on major rivers all around the world and freighters travel to places one could only dream of visiting.

Any other comments on career opportunities in this field?

This is an industry that is very stable. People will always need to move products in bulk capacity. The barge industry is the most cost-effective and environmentally sound way to do this, and it's also the safest mode of transportation. The industry changes as our customers' needs change, and we're ready to move whatever goods need to be moved. It's good to know that we're in an industry that changes and there will always be jobs in our line of work.

New NEED Curriculum on River Transportation Coming This Fall

NEED and RiverWorks Discovery are partnering to develop a new curriculum on river transportation that will be available this fall. Targeted for middle school and high school audiences, the curriculum will integrate science and social studies. Included in the module will be background information on forms of energy, energy transformations, and sources of energy. The text will go more in-depth into the energy sources that are transported on our inland river highways. Students will also learn about river formations, the historical impact of rivers on economic growth and river communities, and how rivers have been used for transportation historically and in the current-day context.

Like all NEED materials, the background information is accompanied by hands-on, high-interest activities. There will be lessons appropriate for both science classrooms and social studies classrooms that connect science, social studies, math and language arts. Activities being developed include map reading and analysis, investigations reinforcing learning about how rivers flow, and a barge design challenge.

Keep checking NEED's website (www.need.org) for more information.

