





SECTORAL SHIFT: AN UNPRECEDENTED OPPORTUNITY IN WATER MANAGEMENT

WATER WORKFORCE DEVELOPMENT ANALYSIS COMPLETED BY GNO, INC., COMMISSIONED BY THE KRESGE FOUNDATION

April 2017

FOREWORD

Proactively addressing the environmental challenges of Southeast Louisiana has put the state and region in a "tip-of-the-spear" position as it relates to the protection and enhancement of critical coastal infrastructure assets. With the land-loss and subsidence challenges of the region placing it in one of the most precarious and vulnerable positions of any delta, nationally or internationally, resources and assets on which the nation is dependent energy, commerce and fisheries—are under threat from environmental uncertainties. Moreover, these sectors are important economic engines that have traditionally underpinned the coastal economies of Southeast Louisiana. Furthermore, flooding and subsidence in urban areas make our broader economy and communities vulnerable. Whether or not we protect our communities and economies is not a question being debated in the region; the issue at hand is how restoring our fragile environmental resources will build that necessary resilience.

Answering this question includes, but also goes beyond, the science-based projects and proposals outlined in such resources as Louisiana's *Comprehensive Master Plan for a Sustainable Coast* (Coastal Master Plan), *The Greater New Orleans Urban Water Plan*, or the *Resilient New Orleans* strategy. Though these guiding documents provide a clear path forward for restoring our fragile coast and combating our urban water challenges, they only take into account a fraction of the opportunities these new regimes of water management will provide.

As the economic development alliance for the tenparish region of Southeast Louisiana, Greater New Orleans, Inc. (GNO, Inc.) has a further perspective on the economic, business and workforce impacts the billions of dollars of water projects will bring to the region. These impacts include over 12,000 new job openings in the water management sector in the next 10 years, nearly half of which will be in middle-skilled positions, and all total an average median salary of over \$53,000/year.

This snapshot of the water workforce will be illustrated further in this report, but before addressing these metrics, it is imperative to note a few qualifying parameters:

- These jobs will be filled—either by local Louisiana talent or not
- New workers must be trained, whether through credentials or certifications, or via full PhD tracks

In recognition of these factors, GNO, Inc. has worked throughout 2016 with the Louisiana's Coastal Protection and Restoration Authority (CPRA), regional schools of higher education, and a wealth of other partners, to identify the strategies and activities which must take place today for two- and four-year schools in the region to maximize the economic opportunities in the water sector over the next generation.

If residents of Southeast Louisiana are going to be employed in the water jobs coming online in the next 10-years—taking full advantage of the wealth-building opportunity the water management sector provides—there must be aligned pathways and programs at our regional schools, addressing industry demands and ensuring new generations are employed in a high-growth field.

This report, made possible through a grant from the Kresge Foundation, provides a context for the higher education and workforce training landscape in the region. The content within illustrates the data around water contracting and hiring, and makes recommendations for a more sustainable, equitable future for water management in the region. On behalf of GNO, Inc., I hope readers will find it to be an informative and guiding resource to bring new market opportunities to regional businesses and schools of higher education, and new career pathways for students and our local workforce.

Sincerely, Michael Hecht President & CEO, GNO, Inc.

BACKGROUND

In 2016, thanks to the Kresge Foundation, GNO, Inc. undertook analysis and outreach to identify specific policy and program recommendations for transforming our environmental vulnerabilities into economic opportunities. This effort builds on prior research and efforts by GNO, Inc. on water and workforce, including the *State of the Sector: Water Management* and the *Analysis of Coastal Restoration Workforce Assets, Challenges, and Opportunities in South Louisiana* reports. Specifically, GNO, Inc. undertook the following activities:

- Augmented existing labor / job data and research to reflect the opportunities, project timelines, and potential barriers presented by the now-known BP settlement related to the Deepwater Horizon accident and oil spill
- Conducted a series of briefings and one-onone strategic planning sessions for leadership of regional two- and four-year higher education institutions to support and promote the vision of Southeast Louisiana as an education, training, and innovation leader in coastal restoration, urban water management, and disaster resilience
- Conducted a briefing for interested national and local funders, as well as higher education leadership, on the regional workforce development ecosystem, regional labor market data, higher education water management programming, and relevant funding opportunities.

Water management represents a growing regional job and innovation sector that is a subset of the larger Environmental Management Industry. Environmental management describes products and services that help companies create jobs and revenues by helping other companies, and governments, address environmental challenges. Environmental management consists of subsectors including energy, waste and water.

Through this work, GNO, Inc. realized that regional higher education institutions were positioned to seize upon the generational opportunities being presented in the Environmental Management and water sector. By combining tailored outreach and engagement strategies to the two- and four-year schools with updated data and research, a collective vision for higher education in Southeast Louisiana has been collaboratively established.

While a unified goal is undoubtedly a first step in achieving robust, inclusive academic and workforce training programs, there are a number of benchmarks and objectives which must be advanced to make this collective vision a reality. The findings and recommendations outlined herein intend to set the region and the various entities working with higher education, K-12 education providers, at-risk youth, returning citizens, procurement and small business engagement on a pathway to success.

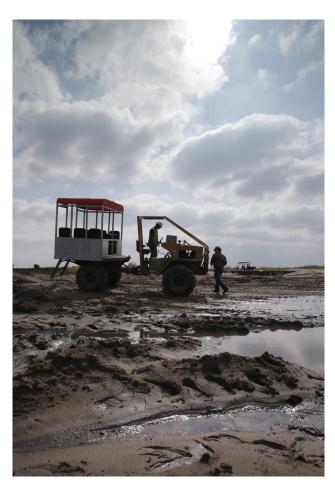
As Southeast Louisiana implements a new wave of innovative water management projects in both the urban and coastal contexts, there is a unique opportunity to maximize the economic impact of environmental restoration. To fully realize these dual benefits, a suite of partners must be aligned in vision, programming, and practices.



METHODOLOGY

GNO, Inc. updated and enhanced its existing research to include the latest job projections and occupational data in the water management sector. Working with partners at The Data Center, Coastal Protection and Restoration Authority (CPRA), and Sewerage and Water Board of New Orleans (S&WB), GNO, Inc. overlaid data updates and workforce needs with demographic trends to outline the lack of diversity and equity shortcomings in the sector. Additionally, in collaboration with CPRA, GNO, Inc. analyzed the project files and resumés of professionals currently working on coastal projects and created a timeline of project life-cycles and related job demands.

However, to truly assess workforce needs and opportunities, direct outreach to firms and higher education partners was vital. To that end, GNO, Inc. met with key leaders at universities and two-year colleges within the region (see Geographic Scope below), as well as with service providers, firms of various scales and sizes, and economic development partners, to fully vet and discuss onthe-ground barriers and opportunities.



GEOGRAPHIC SCOPE

As the economic development alliance for the 10-parish region of Greater New Orleans, the scope of this project included Orleans, Jefferson, St. Bernard, Plaquemines, St. John the Baptist, St. Charles, St. James, St. Tammany, Tangipahoa, and Washington parishes.

Additionally, the following colleges have representatives who serve as University Ex-Officio members on GNO, Inc.'s board of directors.

Four-Year Universities

- Dillard University
- Louisiana State University
- Loyola University New Orleans
- Tulane University
- Southeastern Louisiana University
- Southern University of New Orleans
- University of Holy Cross
- University of New Orleans
- · Xavier University of Louisiana

Two-Year Colleges

- Delgado Community College
- Northshore Technical Community College
- Nunez Community College
- River Parishes Community College
- South Central Louisiana Technical College

GNO, Inc. was also able to leverage its strong relationship with economic development partners in the Bayou Region to engage Fletcher Technical Community College, incorporating a critical partner in coastal areas into the scope of this project. Louisiana State University has also been involved in employer engagement conversations to discuss workforce opportunities and the connection between higher education and coastal & water management employers in the region.

The two- and four-year schools in the region are invested in growing the regional economy and creating opportunity for all.

OUTREACH - Unified Vision and Next Steps for Higher Education

As a result of the outreach and engagement with key leadership, schools in the region were positioned to coalesce around a unified vision for higher-education, benchmarked by three key metrics.

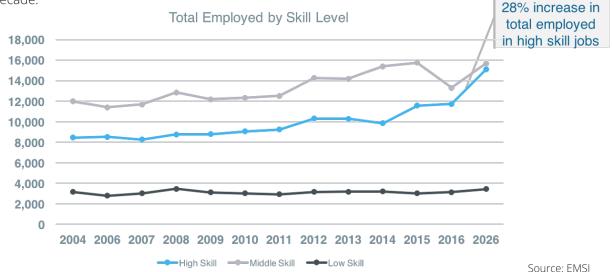
VISION: Greater New Orleans and Louisiana will be the global hub of Environmental Management, including Water Management.

- Local, national, and International students will seek environmental management educational offerings in Greater New Orleans
- Schools of higher education will provide students, job seekers, and workers with middle- and high-skills for career paths in high-wage occupations that match employer workforce demand
- Commercialization of university research will create additional jobs and business opportunities for experts in the region, leading to exportation of new technologies and services

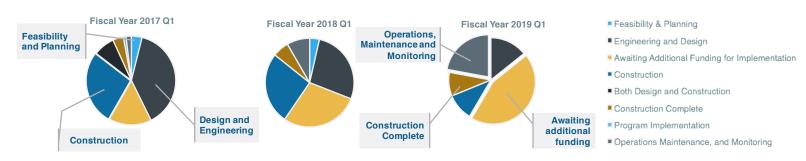
DATA - Environmental Workforce Profiles and Project Timelines

Building on a firm foundation of research and analysis in the Water Management area, GNO, Inc. updated its analysis of jobs and industry opportunity in this sector to further illustrate the emerging growth, gaps and landscape. Key findings from this data update include:

- **High-Skill Job Growth:** Data from EMSI, a national source of labor market data and analysis, indicates that there will be a 28% increase in the number of people employed in high-skill jobs in Water Management in Greater New Orleans over the next ten years. These jobs include—but are not limited to—various types of engineers, construction managers, project managers, and accountants.
- **Middle-Skill Job Growth:** Jobs such as welders, pipefitters, sales associates, and maintenance and repair workers all fall into this category, and are expected to increase by over 5,000 opportunities in the next decade.



• **Project Flows:** Job growth is directly related to the ebbs and flows of projects. In both coastal and urban water management, projects move through three distinct phases: design and engineering, construction, and maintenance, as indicated in the flow diagram below. Each of these phases requires different labor and workforce; the length of these phases is dependent on the type of project, agency and funding available. Though projects may be designed and planned, additional funding may be required to move to the construction and operations phases. A snapshot of projects across multiple fiscal years, categorized by project status, is illustrated below.



• Racial and Equity Discrepancies: The aforementioned middle-skilled landscape is racially diverse, with ratios of white labor to people of color falling nearly along 1:1 lines. In high-skill occupations, however, the gap between races and income levels differ dramatically: people of color are disproportionately underrepresented in this sector, with a scan of high-wage occupations showing over 9,000 white people employed in three top job sectors, compared to 2,268 people of color employed in the same jobs. As indicated in the example of water occupations in the two charts below, the average wages contrast starkly between middle-skill and high-skill job occupations.

Middle-Skill

Description	White Employed	People of Color Employed	Avg. Median Wage
Helpers	472	572	\$14.42/hr
Laborers	6,948	7,101	\$12.66/hr
Landscapers	1,428	1,232	\$11.57/hr

High-Skill

Description	White Employed	People of Color Employed	Avg. Wage
Construction Managers	934	158	\$41.76/hr
Landscape Architects	322	64	\$36.92/hr
Operations Managers	7,817	2,046	\$54.42/hr

Source: EMSI

• Lack of In-State Education: In GNO, Inc.'s analysis of 30 resumes submitted by firms competing for CPRA contracts, only five resumes reviewed noted Louisiana-based higher-education. Key schools and programs included University of Texas, University of Illinois, University of Wisconsin, Indiana University, University of Miami, East Carolina University—though no one program or university dominated the education landscape.

FINDINGS & RECOMMENDATIONS

Based on the outreach and data collection, a clearer vision of the opportunity has been established, and the existing challenges to achieve the regional higher education vision have been identified. In light of the overall mission of our higher education institutions in the region, and clear policy, equity and institutional gaps currently inhibiting holistic progress, the following recommendations seek to create meaningful long-term goals, paired with actionable, short-term progress, which will collectively position philanthropic funders, diverse nonprofit partners, government entities, private firms and university partners to fully realize the beneficial impacts forthcoming environmental investments will bring to Southeast Louisiana.

Clear frameworks must be in place for local firms to take advantage of water management opportunities

FINDINGS

For businesses looking to pursue opportunities in water management, clear expectations around procurement processes and project flows are critical in order to appropriately hire staff and add capacity. To that end, scoring criteria around water management contracts at the state and local level should replicate standards and best practices used in other government entities which prioritize local firm use and engagement. Scoring rubrics and initiatives to ensure firms with local addresses, specialized local services, and Louisiana-educated or trained workforce should be included and prioritized in local and state procurement processes if Louisiana based and trained labor is to fully benefit from these environmental investments.

Yet, even after contracts are let and firms secured, the projects must flow unencumbered to ensure staff — especially contract labor — is not laid off or redeployed to other projects or geographic areas. One of the greatest barriers to project flows and stability are permitting and regulatory processes through government agencies. As the vast majority of water management projects are contracted by local, state or federal entities lengthy permitting at any level can delay advancement of a contract and interrupt the workflow and hiring practices of a private contractor. Thorough project permitting and review, which is an essential part to the regulatory process, must be made more efficient to mitigate costly project delays and interruptions.

Additionally, for local firms and contractors to have an advantage in this landscape, they must be positioned to not only pursue these opportunities, but execute them to the highest standards. Training on local/regional level around green infrastructure and coastal restoration opportunities is important not only from a general awareness front, but also to ensure design standards, execution and project management are in line with the expanded goals of green infrastructure and coastal restoration projects. Pipeline design and safety, for instance, have been mentioned in outreach meetings as a key concern in coastal restoration projects: contractors must be aware of best practices and standards for restoring/protecting wetlands around existing pipeline infrastructure to avoid further oil spills.



Clear frameworks must be in place for local firms to take advantage of water management opportunities

RECOMMENDATION

Ensure Project Permitting Flows Without Significant Delays

Thorough permitting and regulatory processes are essential. However, delays at the federal level threaten to slow down significant coastal construction projects by months to years if not appropriately coordinated and overseen. These delays in the regulatory and permitting process have a trickle-down effect, impacting the hiring of new staff and posing the potential for staff layoffs as well.

REGULATORY ADVOCACY

Through the advocacy efforts of CPRA, GNO, Inc., and a host of environmental and philanthropic partners, an inter-agency Memorandum of Understanding (MOU) has been signed by key federal agencies to expedite these permitting processes. It is now critical to ensure this MOU is enacted and maintained for large-scale restoration projects.

RECOMMENDATION

Maximize Local Firms and Workforce Participation in Water Management Projects

To fully realize the economic opportunity of environmental restoration, local firms and workforce should be positioned for success in this area through further education opportunities and prioritization in procurement. Momentum at the state, local and organizational level is helping to increase advocacy of and advance changes in improving the landscape for small firms: for instance, Governor John Bel Edwards and the CPRA have publicly stated their intent to prioritize Louisiana-based firms in forthcoming bids. As CPRA is the key implementer of coastal projects—overseeing the implementation of the state's Coastal Master Plan— their leadership and engagement on this front is critical.

CONTRACTOR OUTREACH AND ENGAGEMENT

Outreach events and platforms should be created to inform contractors and firms of new opportunities in coastal management and green infrastructure, as well as best practices in implementing these projects.

PROCUREMENT ADVOCACY

To ensure businesses are relocating or expanding operations in Louisiana, as well as support the existing network of businesses currently located here, local firms should be prioritized in project scoring processes.

Colleges and universities should take advantage of and bring to scale frameworks

FINDINGS

As noted in the "Data and Research" section of this report, Louisiana-educated professional workers are woefully underrepresented in our coastal workforce landscape. The expertise to address Louisiana's workforce is being cultivated overwhelmingly in places outside of the region, such as Texas, North Carolina, or even the Midwest area. The current workforce profiles mentioned illustrate an extraordinary opportunity for our local universities to align with industry and environmental needs and create specialized workforce training and research opportunities. The disconnect of regional two- and four- year colleges can be attributed, in part, to the significant resource challenges they are currently facing due to budget constraints across Louisiana. However, these budget challenges are also creating opportunities for higher education to become innovative and market-driven in order to attract local and national students, as well as additional resources to campuses. Greater collaboration and leveraging of resources provides one such pathway to address challenges.

Fortunately, universities in the GNO region already have a model at their disposal: immediately following Hurricane Katrina, Dillard University, Loyola University, Tulane University and Xavier University of Louisiana developed a university consortium in which Dillard and Xavier students attended classes on Loyola University and Tulane University campuses. While this post-Katrina model still exists and is functional, higher education presidents and chancellors recognize challenges the scaling-up of the current consortium framework would present. Further, the model in place currently extends only to four-year schools. If the equity discrepancies noted in the above research are going to be mitigated, clearer pathways must be established between two- and four-year schools.



Colleges and universities should take advantage of and bring to scale frameworks

RECOMMENDATION

Expand/Implement Water Management Consortium

Develop a Water Management Consortium among higher education institutions in the greater New Orleans region in which students and professionals are able to take relevant courses across institutions.

RESEARCH AND DEVELOPMENT

Per feedback from university leadership, specific—yet significant--challenges such as cost-share, student transportation, and course scheduling still exist to make this type of model fully functioning. Laying out a plan and pathway around these nuanced barriers is critical to move forward.

STRATEGIC PLANNING

In addition to working through these specific barriers, higher-level strategy identifying niche programs, courses, and assets at each university is critical to avoiding redundancy and identifying points of leverage and strength.

RECOMMENDATION

Institutionalize Applicable and Relevant Two- and Four- Year Articulation Agreements

The consortium model currently only extends to four-year colleges. Inclusion of two-year schools into this landscape is vital, and to that end establishing two- and four-year articulation agreements in Environmental Management that connect and reconnect students to various pathways is essential in addressing equity concerns.

DOCUMENT AND REPLICATE BEST PRACTICES

Northshore Technical Community College and Southeastern Louisiana University, as well as community colleges and universities outside of the GNO region, have developed best practices for reengaging and retaining university students in the higher education system: these practices should be documented and shared across the region as a replicable model. Furthermore, additional national best practices should be explored.

REPLICATE SUCCESS

Based on the model above, develop a set of articulation structures and pathways between universities and two-year colleges that helps to inform how two- and four-year college programs connect across institutions.

Clearer channels must exist for workforce needs to be reflected to higher education

FINDINGS

Funding of coastal restoration and urban water management projects in the Southeastern Louisiana region over the next several years will create workforce opportunities for high-wage, high-demand jobs. To ensure we are able to fill these workforce needs with local talent, higher education courses and certifications must be tied to industry needs. Employers must work to engage — in real time — the workforce constraints and opportunities, so education partners in the GNO region can fully prepare the future workforce.

Clear collaboration between universities and employers should be established to make certain that programs and training offerings at the higher education level are adequate, effective and aligned. There are not only opportunities for targeted program creation for workforce needs but also opportunities to reduce redundancies in demand-driven programs at institutions. To make these programs truly successful, however, real-time data collection and dissemination is crucial. Currently, data collection lags the needs of universities, creating a barrier to strategic program development in both the short- and long-term.

Beyond creating a data platform — informing stakeholders of job types and projected number of job openings — schools must be aware of the specific industry needs, and the ways their programming could and should be designed to fully address them. While platforms do exist for engagement between higher-ed and the private sector, there are frameworks and formats which will create more meaningful feedback and constructive conversation. These models, in which Industry can inform immediate short-term and long-term needs through strategic convenings with higher education partners, should be employed with greater frequency across the region. Specifically, this will ensure that higher education comes together with employers to understand constraints and opportunities through facilitated "industry-in-the-round" sessions (a national best practice creating a fish bowl styled conversation with employers and higher education partners- in which employers sit at the center of conversation and inform higher education on needs, obstacles and opportunities).

Through creative solutions and restructured engagement, industry can collaborate with higher education to address needs and meet demands

Clearer channels must exist for workforce needs to be reflected to higher education

RECOMMENDATION

Incorporate Real-Time Water Management Workforce Data Collection

Centralize and provide access to real-time workforce data to better inform higher education and water workforce stakeholders of occupational and job needs within the sector.

RESEARCH AND ANALYSIS

Create data platforms and dissemination mechanisms to ensure that schools of higher education, and other workforce trainers, have real-time labor market data & analysis and best practices around Water Management workforce training.

RECOMMENDATION

Develop Strategic Direction of Employer and Higher Education Partnerships

Convene relevant employers and higher education/training providers to discuss strategic direction and capacity of employers to better align employer needs with institutional capabilities.

ENHANCED ENGAGEMENT MECHANISMS

Replicate successful models, such as "Industry-in-the-Round" for universities and training providers to candidly hear industry needs.

COMMUNICATE SPECIALIZATIONS

Higher education specialized core offerings must be developed with industry input and communicated to industry partners to ensure recruitment of students and endorsements of the programs.

RECOMMENDATION

Streamline Employer-to-Higher Education Program Development

Connect individual water management employers to specific higher education institutions in an effort to develop aligned courses, certifications, mentorship/internship opportunities, and/or workforce training/education programs that meet the needs of employers.

PROGRAM DEVELOPMENT

Coordinate employer-led, higher education programs that work to develop specific educational programs that are tailored to employer needs in water management.

Non-traditional approaches and partnerships must be established to remedy equity gaps

FINDINGS

The data update included in this report illustrates a stark discrepancy between racial diversity and middle-skilled jobs, compared to racial diversity in high-skilled jobs — with the latter lacking the parity of the former. The data affirms that though people of color are employed in the water sector, they are not accessing or exposed to the career pathways that exist for job and wealth advancement.

This challenge, however, presents an opportunity to enhance the awareness and understanding of students currently evaluating career paths, as well as to connect existing two-year students to programs at four-year schools, and current workers to further credentialing or education programs. The success of these endeavors will clearly depend on the availability of programs, but there are steps which can be taken now to strategically align missions and institutions, creating a foundation for further advancement and inclusion of people of color in the water landscape.

Of note, Greater New Orleans is home to two premier Historically Black Colleges and Universities: Xavier University and Dillard University. Both of which can drive further diversity in this sector.



Non-traditional approaches and partnerships must be established to remedy equity gaps

RECOMMENDATION

Create Targeted Pathways Between Two- and Four-Year Schools

Linking the offerings of two-year schools with four-year schools is vital to establishing viable career pathways for students and amending existing equity gaps in the water sector. Career pathway development in the water sector can be a replicable model for other sectors.

RECOMMENDATION

Expose Regional Educators and Students to Career Opportunities

High school teachers, and nonprofit organizations working with opportunity youth, must be aware of the range and pathways to career options in the water sector, so that they are able to effectively direct students to programs at relevant institutions as well as increase awareness of full-career ladders available through continued credentialing and training.

PROGRAM DEVELOPMENT

Develop apprenticeship and internship programs for both secondary and post-secondary students in occupations that lack diverse representation and that will expose students to a range of career options in the water sector to create awareness of regional opportunities.

RECOMMENDATION

Incorporate Models of "Wrap-Around Services" in Two-Year Schools

Regional and national schools that have incorporated wrap-around services, such as child-care, transportation, family engagement, and/or mentorship, are increasing retention and graduation rates for students with unique barriers and constraints. Two-year colleges should replicate regional and national student engagement models and best practices to ensure student completion at the community college level and beyond.

CREATE NONPROFIT PARTNERSHIPS

Two- and four-year schools should partner with nonprofits whose missions are focused on college student retention and success to both enhance limited capacity for wrap-around services at two- and four-year schools and to ensure critical needs are met for minority and non-traditional students.

Colleges and universities must position themselves collectively as a premier global hub of water research and programming

FINDINGS

Attracting the best and brightest minds from around the region and the world to colleges and universities in the Greater New Orleans region will develop an elevated workforce as well as an enhanced base of academia, producing leading research and commercializable technologies.

The opportunity that presents itself through this positioning is then two-fold: firstly, to create a dynamic workforce of middle- and high-skilled labor, expertly trained in regional institutions. Secondly, to advance the coastal landscape by fostering innovation in college settings with leading professors, researchers, and graduate students.

While there is significant opportunity to export the unique expertise gleaned from implementing these projects, heightened revenues and business generation are further created by developing and producing technologies, processes and innovations which permanently disrupt the water management business.



Colleges and universities must position themselves collectively as a premier global hub of water research and programming

RECOMMENDATION

Promote a Unified Marketing and Communications Strategy Aligned with Business and Career Opportunities

Advance a unified public relations and marketing strategy designed to promote environmental management education and training in the Greater New Orleans region locally, nationally, and globally and which attracts business, expertise, and investment from across the globe.

MARKETING AND OUTREACH

Ensure public relations and communications strategy focuses on creating awareness and education through unified and engaging materials, a website, and other vehicles for communicating educational assets within water management to the local workforce. Public relations and communications strategy should be culturally competent, accessible to all students and persons, and responsive to employer demand.

RECOMMENDATION

Advance Tech Transfer at Universities

Existing and incoming academics must be able to effectively and seamlessly commercialize the research that they are producing. Meaningful partnerships can be extended to create pathways between small business accelerators and university, allowing accelerators, which foster entrepreneurship and connect start-ups to capital and resources, to mine for data, facilitate business opportunities, and promote unique innovations.

ADDRESS UNIVERSITY BARRIERS

As internal and policy barriers around tech transfer arise, identify solutions that benefit researchers and universities in the long run. Often, prohibitive cost share agreements create a disincentive for moving research beyond a university campus. Furthermore, having common templates for contracts and other agreements will serve to streamline transactions.



GREATER NEW ORLEANS, INC. 1100 Poydras Street Suite 3475 New Orleans, LA 70163

Phone 504.527.6900

www.gnoinc.org