

# The Economic Impact of the University of New Orleans Research and Technology Park

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# Table of Contents

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Executive Summary..... 1

About this Study..... 5

Economic Impact..... 6

Workforce Impact ..... 9

Business Impact ..... 11

    The IT and Cybersecurity Cluster ..... 12

    The Logistics and Lab Testing Cluster ..... 13

Research Impact..... 14

    Shell Stock Assessment for Sustainable Oyster Production ..... 14

    Geospatial Information Systems for Fish Tagging..... 15

    Use of Unmanned Aircraft Systems for Coastal Protection and Restoration Projects ..... 15

Methodology..... 17

Appendix 1: Tenant Companies by Cluster ..... 19

Appendix 2: UNO Alumni Employed by UNO RTP Tenants by Degree Type..... 20

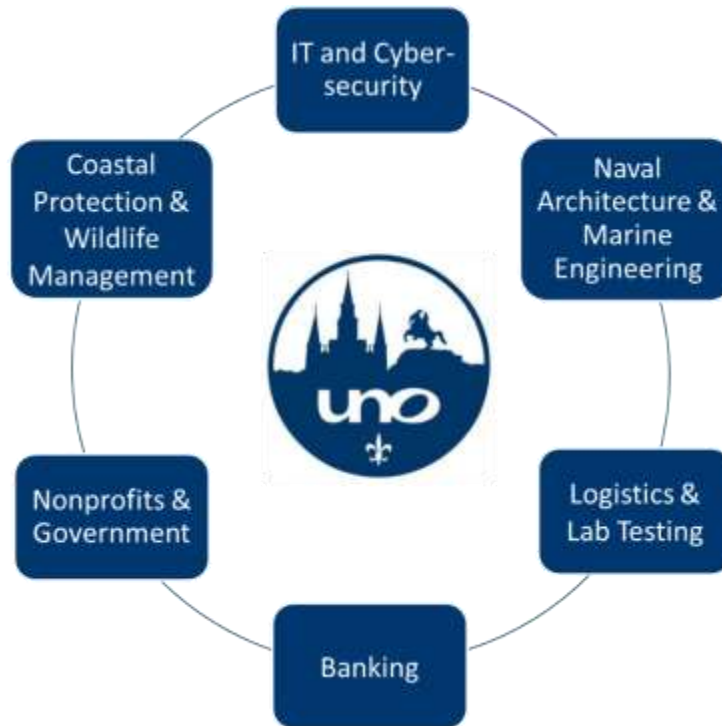
Appendix 3: Economic Impact Tables ..... 21

## Executive Summary

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The University of New Orleans Research and Technology Park (UNO RTP) is comprised of two campuses. The primary location, Lakefront Campus, is located along the southern shore of Lake Pontchartrain and occupies 30 acres of land adjacent to the University of New Orleans (UNO). It is home to the University of New Orleans Research and Technology Foundation, Inc. (Research Foundation) and 34 tenant companies and organizations.<sup>1</sup> A satellite facility, Avondale Campus, is located approximately 20 miles away on the west bank of the Mississippi River in Avondale, Louisiana. The Avondale Campus is approximately 4.5 acres and is occupied by a single tenant. The UNO RTP tenants include a mix of private companies, government agencies, and nonprofit organizations concentrated in six key clusters of research and economic activity, as shown in Figure ES-1.

Figure ES-1: UNO Research and Technology Park: Key Clusters Represented by Tenants



Source 1: TEconomy Partners, LLC








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<sup>1</sup> TEconomy did not include UNO operations in the UNO RTP in its analysis, since UNO's employment and expenditures are included in the recent economic impact analysis of UNO. See Division of Business and Economic Research (2016). *Economic Impact of the University of New Orleans 2014-2015*.

## Economic Impact of the UNO Research and Technology Park

In 2016, the Research Foundation and UNO RTP's 34 tenant companies and organizations directly employed 1,678 people, with total operating expenditures of \$235.0 million.<sup>2</sup> While this, alone, represents a sizeable impact on the New Orleans region, the research park's total economic impact extends well beyond these direct impacts when factoring in the combined effect of park operations and employment on other local businesses.<sup>3</sup> **UNO RTP generated \$472.1 million in total direct, indirect, and induced economic output, supporting 3,529 jobs with \$241.2 million in compensation, and \$15.6 million in state and local tax revenue across the eight-parish region.** TEconomy's estimates of these impacts are presented in Figure ES-2.

Figure ES-2: UNO RTP's Total Economic Impact on the Eight-Parish Region, 2016

Direct Impact		Total Impact	
Employment	 1,678	→ Employment	 3,529
Average Salary	 \$72,637	→ Wages and Benefits	 \$241.2M
Operating Expenditures	 \$235.0M	→ Economic Output	 \$472.1M
		→ State and Local Taxes	 \$15.6M

Source 2: TEconomy Partners analysis and calculation using Louisiana parish-level IMPLAN impact models.

What is the total economic impact of UNO and UNO RTP combined? UNO had an economic impact analysis conducted for the university in 2016, and the table below presents the direct and total economic impact estimates for UNO in fiscal year 2014-2015 and UNO RTP in calendar year 2016. The direct impact figures indicate that the specific drivers of each organization's economic impact are different. A significant portion of UNO's economic activity is driven by alumni expenditures<sup>4</sup>, whereas UNO RTP's impact is driven by tenant companies and organizations' employment and operating expenditures.

<sup>2</sup> The total impact includes the partial-year impacts of two tenant organizations that left the research park in 2016: the Governor's Office of Homeland Security and Emergency Preparedness and the School Leadership Center of Greater New Orleans.

<sup>3</sup> Corporate operating expenditures are also known as indirect impacts; personal consumption expenditures are known as induced impacts.

<sup>4</sup> The economic impact study calculates alumni expenditures by estimating the proportion of Louisiana residents who are UNO alumni, who reside in the eight-parish region, who are assumed to not have obtained a degree if UNO did not exist, and who are assumed to have higher marginal incomes relative to Louisiana residents who only have a high school degree based on U.S. Census data reporting income for different educational attainment levels.

Taken together, the combined impact of UNO and UNO RTP on the region is nearly \$1 billion (\$942.6 million) and supports over 11,000 jobs. Both individually, and in concert, UNO and UNO RTP represent important economic engines for the New Orleans region and the State of Louisiana.

Figure ES-3: Comparison of UNO RTP and UNO Direct and Total Economic Impacts

Impact Type	UNO RTP (2016)	UNO (2015)
<b>Direct Employment</b>	<b>1,678</b>	<b>1,115</b>
Direct Operating Expenditures	\$235.0M	\$75.2M
Direct Alumni Expenditures	--	\$210.1M
<b>Direct Combined Expenditures</b>	<b>\$235.0M</b>	<b>\$285.3M</b>
Total Operational Employment Impact	3,529	2,978
Total Alumni Expenditure Employment Impact	--	4,635
<b>Total Employment Impact</b>	<b>3,529</b>	<b>7,613</b>
Total Operational Expenditures Impact	\$472.1M	\$127.2M
Total Alumni Expenditures Impact	--	\$343.3M
<b>Total Expenditures Impact</b>	<b>\$472.1M</b>	<b>\$470.5M</b>

Source 3: TEconomy Partners and Division of Business and Economic Research, University of New Orleans (2016), *Economic Impact of the University of New Orleans, 2014-2015*.

TEconomy also analyzed the park’s functional impacts in terms of the linkages between UNO RTP tenant companies and organizations and UNO. Research parks play an important role in many regional economies by providing park tenants with access to students and graduates with specialized skills, close geographic proximity to companies and organizations in a similar sector, access to specialized technical expertise and equipment for research collaboration, and office and laboratory space in a campus environment that fosters connections to the university and other park tenants. These characteristics are appealing to research and technology-intensive companies. A summary of UNO RTP’s functional impacts on tenant companies and organizations is described below.

**Workforce Impact**—UNO RTP tenant companies and organizations employ 235 UNO alumni, representing a variety of disciplines, with the highest concentration of graduates from:

- Business administration (45),
- Engineering<sup>5</sup>—all disciplines (37),
- Computer science (34), and

<sup>5</sup> Engineering includes graduates from the following departments: naval architecture and marine engineering, mechanical engineering, civil and environmental engineering, and electrical engineering.

## Economic Impact of the UNO Research and Technology Park

- Chemistry (30).

**Business Impact**—UNO RTP has supported a positive clustering, or agglomeration effect, wherein clusters of companies and organizations in similar technology and industry sectors have formed around an anchor tenant organization and is bolstered by UNO’s education and research capabilities. This is evident in the IT and Cybersecurity cluster, which is anchored by the U.S. Department of the Navy’s Space and Naval Warfare Command (SPAWAR) Systems Center Atlantic in New Orleans (NOLA). SPAWAR NOLA has attracted a number of homegrown and branch offices of large IT companies as tenants through its competitive technical contracts. Both SPAWAR NOLA and many of the IT companies work formally and informally with UNO’s Computer Science department.

**Research Impact**—A strong example of a productive research collaboration is that between UNO faculty from the Biology, Computer Science, and Civil and Environmental Engineering departments and the Louisiana Department of Wildlife and Fisheries (LDWF). On-going projects include the development by UNO faculty of algorithms and models for analyzing and interpreting shell and water salinity samples to predict sustainable catches, spacio-temporal information systems and web-based apps for tracking fish migration, and the use of drones for monitoring coastal restoration projects.

## About this Study

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The University of New Orleans Research and Technology Park is comprised of two campuses. The Lakefront Campus offers 600,000 square feet of office and lab/wet-lab space on 30 acres of lakefront property adjacent to the UNO campus. UNO RTP also encompasses a satellite campus that offers an additional 200,000 square feet of space along the west bank of the Mississippi River in Avondale, Louisiana. Managed by the University of New Orleans Research and Technology Foundation, a 501(c)(3) non-profit organization, the research park was established to increase the academic vitality of the University of New Orleans and surrounding academic institutions and to strengthen the economy of the City of New Orleans and the State of Louisiana. In particular, the mission of UNO RTP is to:

1. Develop collaboration between the public sector in research and development, technology advancement, training and educational opportunities;
2. Promote innovation and creativity through cultural and scientific interaction;
3. Strengthen economic competitiveness and workforce development in the City of New Orleans and the State of Louisiana; and
4. Create a community that fosters a spirit of inquiry and the exchange of ideas.

To mark the research park's 20<sup>th</sup> anniversary, the Research Foundation commissioned TEconomy Partners (TEconomy) to perform analyses to quantify the park's economic impact and profile its key functional impacts. Data inputs into the economic impact analysis include the direct employment, compensation, and operational expenditures of the UNO Research and Technology Foundation, as well as those of its tenant companies and organizations. TEconomy used these direct inputs (collected via surveys and interviews with UNO RTP tenants) to calculate the indirect and induced impacts of tenant organizations in terms of follow-on economic activity, jobs, and tax revenue generated for the State of Louisiana and the eight-parish New Orleans region.

This report presents TEconomy's analysis of the University of New Orleans Research and Technology Park's economic impact, as well as key functional impacts. The research park's functional impacts are those synergistic linkages between UNO and UNO RTP tenant companies and organizations that affect their overall economic competitiveness. TEconomy has categorized UNO RTP's key functional impacts into workforce, research, and business impacts. A description of the methodology is included at the end of the report, and full tables are included as appendices.



## Economic Impact

The University of New Orleans Research and Technology Park is home to the UNO Research and Technology Foundation and 34 tenant companies and organizations, which employ 1,678 people.<sup>6</sup> These tenants include a mix of private companies, government agencies, and nonprofit organizations, and are concentrated in six key clusters of research and economic activity, as shown in Figure 1:

- IT and Cybersecurity
- Naval Architecture and Marine Engineering
- Logistics and Lab Testing Services
- Coastal Protection and Wildlife Management
- Banking
- Nonprofits and Government

Not surprisingly, these sectors dovetail with the University of New Orleans research strengths in: computer science; naval architecture and marine engineering; chemistry and biology; civil, mechanical, and electrical engineering; environmental sciences; and business administration. A full list of tenants organized by cluster is included in the appendix.

Figure 1: UNO Research and Technology Park: Key Technology and Industry Clusters



Source 1: TEconomy Partners, LLC

<sup>6</sup> TEconomy did not include UNO employment and expenditures related to the space it occupies on the UNO RTP campus, because these direct economic impacts are already included in a recent economic impact analysis of the university. See Division of Business and Economic Research (2016). *Economic Impact of the University of New Orleans 2014-2015*.

## Economic Impact of the UNO Research and Technology Park

Many of these clusters are centered around an anchor tenant, which drives other economic activity in the research park. For example, the information technology and cybersecurity cluster is anchored by the Space and Naval Warfare Systems Command New Orleans (SPAWAR NOLA), a major IT support and data center for the U.S. Navy. Numerous IT companies located in the research park have won technical support contracts with SPAWAR, and some of these contractors have employees who work on-site at SPAWAR. Similarly, the Coastal Protection and Restoration Authority (CPRA) and the Louisiana Department of Wildlife and Fisheries (LDWF) support a variety of research and contracts related to coastal protection and restoration, as well as wildlife and fisheries management. CPRA is the single state entity authorized to develop and implement a comprehensive coastal protection master plan for the State of Louisiana.

Proximity to the Port of New Orleans and the Gulf of Mexico supports a range of activities from shipbuilding and ship retrofitting to logistics and lab testing services, all of which enable international trade and is reflected in the research park's tenant mix. The naval architecture and marine engineering cluster is represented by two tenants: Ingalls Shipbuilding and Technology Associates Inc. The logistics and lab testing services cluster is represented by Eurofins Analytical Laboratories, Intertek, and Russell Marine Group. Whitney Bank is the sole tenant representing the banking sector, but it has a significant presence occupying an entire 100,000 square foot building. Its operations at UNO RTP are technical in nature, and include distributed systems applications, telecom management, accounting functions, credit analysis, and training. Finally, there are several government agencies and nonprofit organizations located at the park with a diverse portfolio of activities.








**In 2016, the UNO Research and Technology Foundation and UNO RTP's 34 tenant companies and organizations directly employed 1,678 people, with total operating expenditures of \$235.0 million.<sup>7</sup>**

While the park's direct impact is significant for the region, the total economic impact generated by UNO RTP tenants extends well beyond their direct employment and expenditures. The park's total economic impact includes: (1) indirect, or secondary, economic activity generated when park tenants purchase goods and services from other Louisiana companies, and (2) induced, or tertiary, economic activity when tenant employees spend their personal income purchasing goods and services in the local economy. Both types of expenditures (i.e., corporate and personal spending) support a range of other economic activity in the regional and state economy. These positive secondary and tertiary impacts are referred to as "multiplier effects." Figure 2 summarizes UNO RTP's direct and total economic impacts.

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<sup>7</sup> The direct impact includes the partial-year impacts of two tenant organizations that left the research park in 2016: the Governor's Office of Homeland Security and Emergency Preparedness and the School Leadership Center of Greater New Orleans.

Figure 2: Total Economic Impact on the Eight-Parish Region, 2016

Direct Impact		Total Impact	
Employment 	1,678	Employment 	3,529
Average Salary 	\$72,637	Wages and Benefits 	\$241.2M
Operating Expenditures 	\$235.0M	Economic Output 	\$472.1M
		State and Local Taxes 	\$15.6M

Source 2: TEconomy Partners analysis and calculation using Louisiana parish-level IMPLAN impact models.

When the research park’s secondary and tertiary impacts are factored in, the UNO Research and Technology Foundation and 34 tenant companies and organizations **generated \$472.1 million in total economic output, supported 3,529 jobs with \$241.2 million in compensation, and \$15.6 million in state and local tax revenue across the eight-parish region in 2016.**<sup>8</sup>

<sup>8</sup> The total impact includes the partial-year impacts of two tenant organizations that left the research park in 2016: the Governor’s Office of Homeland Security and Emergency Preparedness and the School Leadership Center of Greater New Orleans.

## Workforce Impact

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The University of New Orleans is a comprehensive urban research institution offering undergraduate through doctoral degrees. Not surprisingly, there is a robust link between the graduates produced by UNO and their recruitment by companies and organizations located in the research park. Many of UNO RTP's tenant companies and organizations have hired UNO students as interns and for full-time positions. UNO offers the only civil and mechanical engineering degree programs in New Orleans<sup>9</sup> and is also the only university in the Gulf Coast region with a School of Naval Architecture and Marine Engineering, where students are trained to design boats, ships, and offshore structures. Companies located in the park that draw on this niche talent pool include Ingalls Shipbuilding and Technology Associates Inc. With its faculty expertise in cybersecurity, UNO's Computer Science department is another UNO department producing talent in high demand. As demonstrated in the data below, SPAWAR NOLA and some of the IT companies located in the research park employ a large number of UNO computer science graduates.

As part of our analysis, TEconomy surveyed tenant companies and organizations to see if they employ UNO alumni and, if so, from which departments these individuals graduated. TEconomy and the Research Foundation collected data on 27 of the 34 tenants in the park and the Research Foundation staff. These tenant companies and organizations employ 235 UNO alumni, representing 14% of total full-time park employment.

The alumni represent a variety of UNO disciplines, with the four highest concentration of graduates from: Business Administration (45), Engineering—all disciplines (37), Computer Science (34), and Chemistry (30). Within Engineering, Naval Architecture and Marine Engineering (12) and Civil and Environmental Engineering (12) had the highest concentration of alumni followed by Mechanical Engineering (8) and Electrical Engineering (7).

The word cloud in the figure below presents data on the departments from which UNO alumni, who are working as full-time employees in the research park, earned their degrees. The size of the font in the word cloud is proportional to the number of UNO alumni from that department who are employees in the park, i.e., the larger the font, the more UNO alumni with a degree from that department.

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<sup>9</sup> In 2005, the Board of Tulane University voted to eliminate the departments of Civil and Environmental Engineering, Electrical Engineering and Computer Science, and Mechanical Engineering due to the cost of damages incurred following Hurricane Katrina and an undergraduate enrollment-related decline in income. For background information, see Jocelyn Kaiser (2005), "New Orleans Universities Slash Faculty," *Science*, 9 December 2005. <http://www.sciencemag.org/news/2005/12/new-orleans-universities-slash-faculty>

Figure 3: UNO Departments Represented by UNO Alumni Employed in the Park



Source 3: UNO Research and Technology Park tenant interviews.

Many other disciplines spanning the sciences, social sciences and humanities are also represented by UNO alumni employed in the park: Education (11), Biology (9), English (5), Interdisciplinary (5), Marketing (5), Communications, Film & TV (4), Earth Sciences (4), Finance (4), and History (4).

In addition to hiring UNO alumni talent, UNO RTP companies have worked with UNO faculty on curriculum development and new classes. For example, the CEO of an IT company in the park stated that he has suggested the addition of a new class based on the evolving needs of his clients. The faculty at UNO are receptive to these suggestions, and evaluate the merits of each request. The Computer Science department has added, on occasion, a new class based upon a recommendation. The executive said he was very happy with the caliber of students graduating from UNO's Computer Science department whom he has hired. Similarly, Eurofins has worked closely with UNO Chemistry department faculty providing input on curriculum, especially the labs, to provide students with practical experiences that are aligned with the type of work they will be doing if they enter the analytical testing industry upon graduation.

In another example, the CEO of one of the two shipbuilding firms located in the park stated that UNO students are unique, because many of them have had practical experience working in a shipyard. Specifically, for employees hired from UNO's Naval Architecture and Marine Engineering program, one had previously been a welder and another had been a pipe fitter. The difference between students who have largely studied ships and shipbuilding in a classroom versus those who have worked on actual ships is significant.

## Business Impact

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A second key functional impact of UNO RTP is generated from the many ways in which research parks support business growth and competitiveness. TEconomy asked UNO RTP companies and organizations about the benefits of being located at the research park vis-à-vis other possible locations in New Orleans or across the eight-parish region. Respondents cited the following reasons as being important to their decision to locate in the UNO research park:

**Branding**—being located within the university research park communicates to clients that the research or technology-intensive company brings similar objectivity, rigor, and fresh ideas to their products and services

**Access to talent**—enables tenant companies and organizations to engage a diverse group of students and faculty with expertise across many disciplines

**Proximity to companies and organizations in the same sector**—facilitates easy interaction and collaboration among companies and organizations in related sectors. The Coastal Protection and Wildlife Management cluster and the IT and Cybersecurity cluster are good examples of this kind of interaction.

Historically, UNO RTP has had a variety of anchor tenants which have formed the nucleus for the emergence of particular industry and technology clusters in the park. These have included Ingalls Shipbuilding (a division of Huntington Ingalls Industries), the Governor's Office of Homeland Security and Emergency Preparedness (GOHSEP), the Coastal Protection and Restoration Authority (CPRA), and the Space and Naval Warfare Command (SPAWAR).

Ingalls Shipbuilding Avondale Operations (formerly Avondale Industries) served as the anchor for the Naval Architecture and Marine Engineering cluster at UNO RTP. When the Avondale campus was established in 1997, Avondale Industries employed 6,000 people and was the largest manufacturer in the state. Ingalls closed the shipyard facilities in 2014; today only the UNO/Avondale Maritime Technology Center of Excellence (MTCE) ship design facility remains in operation on the site. The MTCE is located approximately 20 miles from UNO as a satellite campus of the park. In the past, the company sponsored endowed chairs and research at UNO, hosted classes on-site, and provided applied research experiences for UNO engineering students.<sup>10</sup>

The devastation caused by Hurricanes Katrina and Rita (both of which hit New Orleans in 2005) resulted in the Governor's Office of Homeland Security and Emergency Preparedness and the Coastal Protection and Restoration Authority locating at UNO RTP. Their presence helped spur the emergence of the coastal restoration side of the Coastal Protection and Wildlife Management cluster, which focuses on designing, implementing, and managing projects to rebuild public infrastructure and restore coastal areas. The Louisiana Department of Wildlife and Fisheries is also an important tenant located in the park, which is part of the Coastal Protection and Wildlife Management cluster, and will be discussed in more detail in the Research Impact section of this report.

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<sup>10</sup> Ingalls Shipbuilding built its last Navy warship at the Avondale site in 2014 and has shifted most of its employees and activity to its Pascagoula, Mississippi, headquarters. UNO RTP retains the UNO/Avondale Maritime Technology Center of Excellence which houses approximately 250 people, including contractors.

Over the past five years, as Ingalls Shipbuilding has shifted and consolidated its U.S. Navy shipbuilding efforts to the company's headquarters in Pascagoula, Mississippi, and other locations, and as New Orleans' hurricane reconstruction and coastal restoration projects have wound down, there has been a commensurate downsizing of economic activity in the Naval Architecture & Marine Engineering and the Coastal Protection & Wildlife Management clusters. This has impacted the size (measured by employment) and number of engineering, environmental consulting, and shipbuilding companies in the park. However, other clusters have maintained their presence or are expanding, and this section details two case studies of how UNO RTP provides both the physical space and linkages to UNO that has helped catalyze the emergence of new clusters around an anchor tenant: (1) the IT and Cybersecurity Cluster and SPAWAR NOLA and (2) the Logistics and Lab Testing Cluster and Eurofins.

### The IT and Cybersecurity Cluster



SPAWAR NOLA is the U.S. Department of the Navy's full-service provider of information technology services and integrated enterprise solutions. The organization offers a comprehensive range of information technology products and services from requirements identification and analysis, systems and production engineering, and telecommunications support to architecture design, quality assurance, product testing, and advanced networking operations to support the U.S. Navy.

SPAWAR NOLA is responsible for supporting legacy Navy personnel and pay systems. In addition, they provide support for other activities such as: Commander, Naval Reserve Force; Navy Recruiting Command; Navy Personnel Command; Department of Homeland Security; Business Transformation Office; and the Veterans' Administration. SPAWAR NOLA, which reports to the SSC Atlantic headquarters in Charleston, SC, has been located at UNO RTP on the Lakefront Campus since 1998.<sup>11</sup>

The SPAWAR NOLA Office employs over 700 people, including contractors who are employees of several IT and cybersecurity companies located in the park. Some of these IT companies, such as the Louisiana Technology Group (LATG) and GCR, Inc., are home-grown, small and medium-sized enterprises (SMEs) that have expanded by winning significant technical support contracts with SPAWAR NOLA. These contracts have provided a base of business to these small/medium enterprises, enabling them to grow and diversify their offering for other private and public sector clients. Others IT companies at UNO RTP that have found it strategically beneficial to have a research park presence in close geographic proximity to SPAWAR NOLA include Geocent, Accenture, and CoSolutions. As mentioned in the Workforce Impact section, SPAWAR NOLA currently employs over 60 UNO graduates and runs an internship program, in addition to supporting a range of science, technology, engineering, and mathematics (STEM) programs for New Orleans K-12 students.

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<sup>11</sup> The 2005 Base Realignment and Closure (BRAC) process resulted in the reorganization of SPAWAR New Orleans into SPAWAR Systems Center Atlantic Detachment New Orleans, with Detachment New Orleans reporting to the SSC Atlantic headquarters in Charleston.

In the past, SSC Atlantic has collaborated with several UNO academic departments on a variety of sponsored projects. Notable among these are research contracts awarded for the following projects:

- Enterprise solutions (Electrical Engineering and Management departments);
- Dynamic civilian career planning and management (Naval Architecture & Marine Engineering and Computer Science departments);
- Geo-acoustic and secure communications (Electrical Engineering, Computer Science, and Physics departments);
- Legacy system renovation (Computer Science department); and
- Electrochemical treatment of bilge water/electro-disinfection of ballast water (Civil & Environmental engineering department).

A second example of the mutually reinforcing positive business dynamic enabled by UNO RTP is the Logistics and Lab Testing cluster, which is anchored by the global analytical testing company Eurofins.

### The Logistics and Lab Testing Cluster

Eurofins is a global corporation, headquartered in Belgium, with 190 analytical testing laboratories located in 35 countries and over \$2 billion in annual revenue.<sup>12</sup> These labs serve clients across multiple life sciences industries from agriculture to food to pharmaceuticals. At the UNO RTP, Eurofins Analytical Laboratories performs analysis that enables clients to establish the safety, identity, authenticity, origin, and purity of biological substances.

This type of testing enables “buy-sell” transactions of grain and grain by-products via analytical assessment and verification before export from the Port of New Orleans. Examples of Eurofins clients include agribusiness heavyweights such as ADM, Cargill, and Bunge, among many others. The company also provides food safety consulting and environmental testing for a wide range of local, regional, and international clients.

Eurofins’ ongoing development of proprietary, analytical testing methods has supported the company’s impressive growth, from 45 employees to over 125 employees, in the last five years at its location in the research park. Seventy-five percent of Eurofins’ employees are staff scientists, and 90% of these are analytical chemists and biologists. The company draws on graduate talent from UNO and other local universities for entry-level hires and currently, Eurofins employs nearly 25 UNO alumni—primarily graduate students from UNO’s Chemistry and Biology departments.<sup>13</sup>

The company has a particularly strong working relationship with the UNO Department of Chemistry. Eurofins scientists serve as informal advisors on curriculum development for the UNO Chemistry program. The company has provided funding for an endowed professorship in analytical chemistry, sponsors a joint-PhD program, and offers paid internships to provide UNO students with applied

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<sup>12</sup> D&B Hoovers database.

<sup>13</sup> Interview with John Reuther, President, Eurofins Central Analytical Laboratories, January 12, 2017.



analytical experiences while also enabling Eurofins to get a firsthand look at up-and-coming graduate-level talent. Eurofins has also provided the private funding for a professorship in Molecular Biology.

Other companies in the emerging Logistics and Lab Testing cluster include Intertek, a multinational inspection, product testing and certification company headquartered in the UK, and Russell Marine Group (RMG), a one-stop shipping and logistics company. RMG supervises, inspects, books/forwards freight, tests (through its relationship with Eurofins) and coordinates shipping logistics.

## Research Impact

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In addition to the business impacts described in the previous section, a primary reason that research- and technology-based companies and organizations choose to locate within university research parks is to be near the accompanying large pool of interdisciplinary faculty and research talent. The number of university research parks in the United States has continued to rise, as large companies continue to downsize their internal R&D labs, as tech transfer and spinout activity from universities increases, and as technology companies realize the benefits of clustering among related firms and human capital. In each case, the potential for establishing working relationships with faculty who bring specialized subject matter expertise is an important draw. Whether formal or informal, these relationships are valued both by companies and other tenant organizations.

One example of a productive research collaboration is between faculty from the UNO departments of Biology, Computer Science, Civil and Environmental Engineering, and Planning and Urban Studies and the Louisiana Department of Wildlife and Fisheries. LDWF's mission is to manage, conserve, and promote the sustainable use of Louisiana's renewable fish and wildlife resources. In the case of fisheries management, LDWF monitors boats, assesses the amount of fish and oysters collected, and decides the point at which access to sea grounds needs to be restricted. LDWF is currently engaged with UNO faculty on several on-going contracts and projects to maintain sustainable levels of oysters, shrimp, and various species of fish along the Gulf Coast.

### Shell Stock Assessment for Sustainable Oyster Production

Historically, Louisiana has accounted for nearly half of the Gulf oyster harvest and about a third of U.S. oyster production.<sup>14</sup> The state has more than a dozen naturally producing public oyster bed areas occupying more than 1.7 million acres of sea bottom in the Gulf of Mexico, and it's the LDWF that sets oyster seasons, monitors harvest levels, and implements projects to improve oyster habitats. To strengthen its annual oyster stock assessment, which informs LDWF's estimate of sustainable allowable catch each year, LDWF engaged faculty from the UNO Biology and Computer Science departments to help them improve the efficiency and precision of their oyster stock assessment process.

Samples were taken from different public oyster beds and inputted using an automated data entry form. The UNO Biology and Computer Science team developed a model that estimates the number of sacks of seed and sack oysters that can be removed during a season without a loss of cultch (i.e., fossilized shell,

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<sup>14</sup> National Marine Fisheries Service, National Oceanic and Atmospheric Administration.

coral, and other similar materials produced by living organisms that provide points of attachment for oysters).<sup>15</sup> The UNO Computer Science team then developed the algorithms to analyze and interpret the data from the sample collection. Through a Gulf-wide grant, the UNO Biology team also provided training to oyster crews on how to conduct the sampling, input the data, and analyze the results which indicate the number of oysters that can be safely harvested.

### Geospatial Information Systems for Fish Tagging

In addition to monitoring oyster production and harvest, LDWF establishes quotas and monitors catches for sustainable fishing of various species in Lake Pontchartrain and off the Louisiana coast. To help with this effort, LDWF engaged the UNO Computer Science and Biology faculty to design a spacio-temporal information system (STIS) for an acoustic telemetry-tagging project on Lake Pontchartrain, i.e., the remote tracking of fish via a small sound-emitting device. The project collects real-time data on the movement of individual speckled trout, as well as associated environmental data, and the goal is to use the remote tracking and information system to study seasonal migration patterns of speckled trout in Lake Pontchartrain.

For a more traditional fish tagging effort, UNO Computer Science faculty built the interface (i.e., the mobile app) and the spacio-temporal information system for a voluntary program aimed at a better understanding of the movement patterns and habitat use of targeted fish species. This STIS includes a geospatial portal that enables LDWF to perform data entry, content management, and report generation. The portal also enables anglers to perform on-line submission and manage their own captures/recaptures. Further, submission can also be performed via the UNO-designed app while the angler is still on the water.<sup>16</sup>

### Use of Unmanned Aircraft Systems for Coastal Protection and Restoration Projects

Research involving drones to characterize and monitor the Louisiana coast is being led by faculty in UNO's Civil and Environmental Engineering department, as well as the Planning and Urban Studies department. The research is funded by Louisiana Sea Grant, part of the National Oceanic and Atmospheric Administration's (NOAA) National Sea Grant Program. UNO faculty engaged Coastal Protection and Restoration Authority staff to select project sites.

Annually, the coastal Louisiana and the Mississippi River basin lose approximately 16 square miles of marsh land. Unmanned aircraft systems, commonly known as drones, can be used for rapid acquisition of high-resolution aerial surveys and collection of geospatial data for coastal protection and restoration

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<sup>15</sup> Soniat, T.M., Ed. (2015). Synopsis of the Fourth Annual Louisiana Oyster Stock Assessment Workshop. University of New Orleans, New Orleans, LA.

<sup>16</sup> Interview with Mark Schexnayder, Director, Fisheries Habitat Division, Louisiana Department of Wildlife and Fisheries. May 5, 2017, and Gulf States Center for Environmental Informatics, University of New Orleans. "Environmental Geospatial Information Systems Development for the Louisiana Department of Wildlife and Fisheries," Blog. November 3, 2015.

[http://gulfscei.cs.uno.edu/research/environmental\\_geospatial\\_information\\_systems\\_development\\_for](http://gulfscei.cs.uno.edu/research/environmental_geospatial_information_systems_development_for)

projects. Plus, they have many advantages over airplane and satellite images. One big advantage is that a drone can fly at a very low altitude, enabling extremely high-resolution imagery. When processed with ground positioning information, drone photography can produce 2D and 3D geospatial models with accuracy of less than an inch. Secondly, a drone can accurately repeat flights over a specific area, which allows monitoring of change over time—e.g., flooding, beach erosion/restoration, changes in vegetation or wildlife utilization, the success or failure of mitigation projects, and pre- and post-storm conditions. A drone can also be used to detect infrastructure problems along levees, dikes, and floodwalls. All these capabilities allow the project team to survey areas where traditional surveys would be very time-consuming and expensive.<sup>17</sup>

In each of these three research collaborations, it is clear that the location of companies and organizations with important needs, in close proximity to UNO, can drive innovation through applied research. Interdisciplinary research collaboration by UNO faculty resulted in novel, technology-based approaches to solving challenges related to shell stock assessment, sustainable fishing through fish tagging, and monitoring of coastal areas and infrastructure.

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<sup>17</sup> Center for Natural Resource Economics and Policy, Louisiana State University (2016). Conference Program/Abstracts. Challenges of Natural Resources Economics and Policy 2016: 5th National Forum on Socioeconomic Research in Coastal Systems. Held March 20-22, 2016, in New Orleans, LA.

## Methodology

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Driven by the internal and external factors that impact the overall levels of consumption, production, investment, government spending, and net exports, regional economies expand and contract over time. Economic impact analysis seeks to estimate how the economic activity generated by a particular investment, or through the expansion or contraction of particular organizations or industry sectors affects the local and regional economy.

For example, studies have been conducted that measure the economic impact of a university expansion on a local economy, or conversely, the economic impact associated with the decline of a manufacturing industry. TEconomy's study builds on this body of work to measure the "economic footprint" of the University of New Orleans Research and Technology Park on the eight-parish region and on the State of Louisiana.

TEconomy used an economic input-output (I/O) model to analyze the relationships between UNO RTP tenant companies and organizations and other economic actors in the regional and state economy. These relationships are linked through expenditures. UNO RTP and its tenant companies and organizations directly employ individuals and have operational expenditures that generate business for other companies in the region. In addition, UNO RTP employees generate demand for goods and services through their personal spending in the local economy.

In general, higher wage industry sectors will generate more economic activity (through higher personal incomes and larger personal consumption expenditures) than lower wage industry sectors. This means that the expansion of companies in high-tech sectors will tend to have a larger economic impact than, say, new retail activity. Similarly, an industry's purchases of goods and services from within the region will result in more economic activity by stimulating local demand, while imports of goods and services from outside the region will result in less economic activity.

Economic impact or I/O models measure three types of impacts:

- **Direct effects:** the direct employment and other economic activity generated by a firm or industry sector's operations and expenditures;
- **Indirect effects:** the economic activity generated for supplier firms by the target firm or industry sector, and
- **Induced effects:** the additional economic activity generated by the spending of direct employees and the employees of the supplier firms in the overall economy.

The sum of these three effects is referred to as **total economic impact**. TEconomy estimated the total economic impact of UNO RTP and its tenant companies and organizations using regional I/O models available from IMPLAN. IMPLAN is one of the most widely used and respected I/O software platforms and provides highly detailed data tables representing 536 economic sectors at the national, state, and county levels.<sup>18</sup>

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<sup>18</sup> IMPLAN provides the ability to combine county or parish data into models that represent a specific geographic area, such as a multi-county service region or a metropolitan statistical area (MSA).

## Economic Impact of the UNO Research and Technology Park

TEconomy collected and analyzed employment, payroll, and operating expenditures data for the Research Foundation and its tenant companies and organizations in the UNO RTP. TEconomy then used the IMPLAN system to develop impact estimates for the eight-parish region and the State of Louisiana.

## Appendix 1: Tenant Companies by Cluster

Coastal Protection and Wildlife Management	
Coastal Environments	Consulting company
Louisiana Coastal Protection & Restoration Authority	Government
Lake Pontchartrain Basin Foundation	Non-profit
Louisiana Department of Wildlife & Fisheries	Government
IT and Cybersecurity	
Accenture Federal Services	IT company
aVenture	IT company
CoSolutions	IT company
GCR Inc.	IT company
Geocent	IT company
Global Technical Resources	IT company
Louisiana Technology Group	IT company
U.S. Navy Space and Naval Warfare Command (SPAWAR)	Government
Wizz Systems dba IDScan.net	IT company
Naval Architecture and Marine Engineering	
Ingalls Shipbuilding	Shipbuilding company
Technology Associates Inc.	Maritime design company
Logistics and Lab Testing	
Eurofins Analytical Laboratories	Lab testing company
Intertek	Lab testing company
Russell Marine Group	Shipping logistics company
Banking	
Whitney Bank	Bank
Other Government and Nonprofits	
City of New Orleans – Crime Lab	Government
City of New Orleans – Police Academy	Government
Louisiana Office of Community Development	Government
Louisiana Legislative Auditors	Government
New Beginnings Foundation	Non-profit (charter school)
New Orleans Educational Telecommunications Consortium	Non-profit
Smoking Cessation Trust (SCT) Management L3C	Low-profit (court established)
Representative Cedric Richmond	Government
Other Companies	
Allit Hospitality	Employment service
BPDC Inc.	Political consulting
HNTB Corporation	Engineering company
Unocity	Engineering services
Virage Community Services	Family/rehabilitation services
Partial Year Tenants	
Governor’s Office of Homeland Security and Emergency Preparedness	Government
School Leadership Center of Greater New Orleans	Non-profit

## Appendix 2: UNO Alumni Employed by UNO RTP Tenants by Degree Type

Department	# of alumni
Business Administration	45
Computer Science	34
Chemistry	30
Education	14
Civil and Environmental Engineering	12
Naval Architecture and Marine Engineering	12
Biology	11
Mechanical Engineering	9
Electrical Engineering	7
English	5
Interdisciplinary	5
Marketing	5
Communications, Film, and TV	4
Earth Sciences	4
Finance	4
History	4
Fine Arts	3
Political Science	3
Urban Studies & Public Affairs	3
Accounting	1
Economics	1
Mathematics	1
Philosophy	1
Physics	1
Sociology	1
Degree not specified	15
<b>TOTAL</b>	<b>235</b>

Source: TEconomy survey of UNO RTP tenant companies and organizations

## Appendix 3: Economic Impact Tables

Three direct operational inputs are used to drive the economic interactions within the impact models (when available): **employment** (conservatively and more precisely captured as full-time equivalent employment), **total compensation** (including wages, benefits, and other compensation), and total operating **expenditures**.<sup>19</sup>

For each operational component, TEconomy's data analysis and calculations provide estimates of the following types of economic impacts, or effects:

**Direct-effect** values driving the model—based upon the employment, compensation, and expenditure data provided by UNO RTP tenants and/or estimated by TEconomy and Research Foundation staff.

Estimated **indirect** and **induced effects** capturing the secondary and tertiary effects of UNO RTP-based employment and expenditures on the regional economy; and

**Total impacts**, which is the sum of the direct, indirect, and induced effects.

These different types of impact effects are presented for six impact metrics: (1) employment, (2) labor income (compensation including both personal and proprietor income), (3) value added (the difference between a company or industry's total output and the cost of its intermediate inputs—also known as contribution to GSP), (4) economic output (revenue or the dollar value of production), (5) state and local tax revenue, and (6) federal tax revenue (including employer and employee contributions to Social Security and Medicare).

For the four non-tax revenue metrics, an impact multiplier is also calculated. These multipliers capture the total number of jobs or dollars created in the regional economy for every job or dollar of direct effect occurring within the UNO RTP. For example, an employment multiplier of 1.90 would indicate for every 1 direct job at a UNO RTP tenant company an additional 0.90 indirect and induced jobs are supported in the region's economy.

The following tables present TEconomy's estimates of the University of New Orleans Research and Technology Park's economic impacts on the eight-parish region and on the State of Louisiana.

**Table 1: Economic Impact of UNO RTP Tenant Companies and Organizations on the Eight Parish New Orleans MSA, 2016.**

Impact Type	Employment	Labor Income	Value Added	Output	State/Local Tax Revenue	Federal Tax Revenue
<b>Direct Effect</b>	1,678	\$154,978,372	\$164,988,652	\$235,017,700	\$4,375,285	\$27,431,504
<b>Indirect Effect</b>	745	\$38,040,102	\$56,342,345	\$89,559,571	\$2,736,013	\$7,902,574
<b>Induced Effect</b>	1,106	\$48,160,866	\$86,758,946	\$147,479,839	\$8,519,916	\$11,570,619
<b>Total Impacts</b>	3,529	\$241,179,340	\$308,089,942	\$472,057,111	\$15,631,214	\$46,904,697
<b>Multiplier</b>	2.10	1.56	1.87	2.01		

Source 1: TEconomy Partners analysis and calculations using County/Parish level IMPLAN models.

<sup>19</sup> At a minimum tenant employment is used to drive the regionally-specific model.



## Economic Impact of the UNO Research and Technology Park

To estimate the economic effects and total impacts of the UNO RTP on the State of Louisiana, a secondary IMPLAN model was developed to represent the rest of Louisiana (the 56 parishes outside of the New Orleans MSA). This model allows for estimating the purchases by UNO RTP tenant companies within Louisiana, yet outside of the New Orleans MSA. Given the economic significance of the New Orleans region to the State of Louisiana, these additional, outside impacts are limited, and therefore, overall State impacts are only slightly larger than the New Orleans MSA impacts.<sup>20</sup>

**Table 2: Economic Impact of UNO RTP Tenant Companies and Organizations on the State of Louisiana, 2016.**

Impact Type	Employment	Labor Income	Value Added	Output	State/Local Tax Revenue	Federal Tax Revenue
<b>Direct Effect</b>	1,678	\$154,978,372	\$164,988,652	\$235,017,700	\$4,375,285	\$27,431,504
<b>Indirect Effect</b>	767	\$39,249,973	\$58,112,768	\$92,954,675	\$2,860,656	\$8,156,212
<b>Induced Effect</b>	1,126	\$49,146,582	\$88,419,234	\$150,754,523	\$8,675,858	\$11,792,522
<b>Total Impacts</b>	3,572	\$243,374,927	\$311,520,655	\$478,726,896	\$15,911,799	\$47,380,238
<b>Multiplier</b>	2.13	1.57	1.89	2.04		

Source 2: TEconomy Partners analysis and calculations using County/Parish level IMPLAN models.

<sup>20</sup> Note: the Direct Effects, the actual employment and expenditures of the UNO RTP tenants, will be the same for both models.