

FLORIDA INTERNATIONAL UNIVERSITY

# Investing in South Florida's Innovative Solutions Center

Federal Priorities



**FIU** | FLORIDA  
INTERNATIONAL  
UNIVERSITY





Friends:

As we focus on restoring our economy and ensuring American competitiveness, Florida International University seeks to advance our federal partnerships aimed at providing solutions to our regional, national and global challenges.

These challenges begin with our vision to help our region's young people thrive in a global economy. With applications up 45 percent, FIU is striving to provide access to a high-quality affordable education. Let us not lose sight of the critical importance of financial aid in South Florida. FIU alone ranks fourth in the country among public universities, with more than 17,000 students receiving Pell grants, 70 percent of those at the level of greatest need.

As an engaged university, we are striving to leverage federal investments and agency partnerships for greater educational impact, especially in Science, Technology, Engineering and Math (STEM) disciplines. Our recently launched STEM Transformation Institute, Mastery Math Lab and ACCESS partnership with Miami-Dade County Public Schools all hold the potential to further every dollar of federal investment in exponential ways. Your public research university has long been critical to the region's scientific and engineering workforce needs and is beginning to be recognized as a national laboratory for STEM success of underrepresented minorities.

FIU students and faculty go to great depths to advance their research that addresses a myriad of complex human and urban problems. With your support, we will achieve greater success as one of Miami-Dade County's anchor institutions committed to community-based solutions. By investing in a multi-agency public-private partnership, NOAA's Aquarius Reef Base, situated 60 feet below the surface in the Atlantic Ocean, will advance the sustainability of the coastal ecosystem; test state-of-the-art undersea technology; train astronauts and specialized divers; and engage the imagination of students studying to be our future scientists and problem solvers.

Since Hurricane Andrew, FIU has been known for its unique strengths in mitigating the effects of hurricanes with its state-of-the-art storm surge model and Wall of Wind testing facility. With our new emphasis on extreme events, we are renewing our promise to help save lives and improve our community's resilience to natural disasters as we develop solutions that can be applied globally. Additionally, we look forward to driving ongoing applied research in neuroprosthetics, which is showing great promise for our veterans, especially those who have lost limbs defending our country.

Federal investments will also be the linchpin in propelling FIU's innovative solutions to economic development and transportation challenges in Miami-Dade County. UniversityCity, the public-private partnership between FIU, the City of Sweetwater, the Miami-Dade Expressway Authority and others, is pursuing projects of regional and national significance to stimulate economic development and provide effective alternatives connecting FIU with the rest of the county. The Informed Traveler Program being developed with IBM could provide a catalytic breakthrough to decongesting our highways (836) while supporting the development of an advanced transit-oriented, sustainable university community.

We recognize the difficulty Congress faces in balancing deficit reduction with the need to invest in areas most critical to our nation's future. Yet, as your previous support has proven, the return on strategic federal investments in research and innovation at FIU is indisputably high-yield for our region and the country.

We appreciate your continued support for FIU's students and our carefully targeted federal priorities, and look forward to working with you on these developing initiatives.

Sincerely,

Mark B. Rosenberg

# FIU Federal Priorities

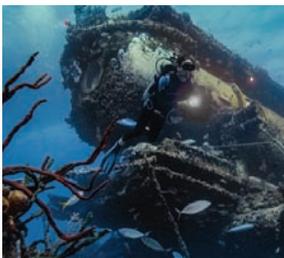
## Investing in South Florida's Innovative Solutions Center



### **Educational Investments – Pell Grants**

Federal financial aid investments at FIU make a critical impact in South Florida, allowing individuals to pursue their dreams while our region gains college-educated professionals. More than 17,000 FIU students currently receive Pell grants — fourth largest in recipients among public universities in the United States — with 69 percent of these students receiving the maximum award based on an expected family contribution of \$0. Eighty-four percent (84%) of financial aid recipients at FIU are First Generation college students. Additionally, more than 20,000 FIU students receive Stafford loans. These students would pay an

average of \$3,400 more over the life of a 10-year loan should interest rate increases double in the summer of 2013. The projected maximum Pell grant for 2013-1014 of \$5,645 must be protected and interest rate increases on Stafford loans forestalled since both programs are a critical lifeline to higher education for low-income families in South Florida and at FIU. Research by our national partner, CEOs for Cities, shows that by increasing local baccalaureate degree production by just 1 percent, the South Florida region would benefit from an expected economic impact of \$1.7 billion. This is only possible with continued federal financial aid investments.



### **Aquarius Reef Base**

Located off Key Largo in the Florida Keys National Marine Sanctuary, the Aquarius Reef Base (ARB) provides scientists with a much more advanced platform for the study of the health of the South Florida reef ecosystem and, ultimately, its relation to the environmental and economic health of the Southeast. The ARB adds a new dimension of research capability and ideally complements FIU's focus on the South Florida marine ecosystem. FIU requests Congressional assistance as it pursues research investments from NOAA, NSF, NASA and other agencies with an interest in using the ARB as a research platform. Specifically, Congressional support is

needed to ensure that NOAA has funding in its budget for the remaining six months of FY 2013 and for FY 2014. Currently, NOAA has contracted with FIU for the operation and maintenance of the ARB, yet only with funding for the first six months of FY 2013 due to the limitations of the continuing resolution. It is important that transitional funding remain in place to support the ARB until FIU can put in place a financial plan for university, government and private industry participants to assume full financial responsibility for ARB operations. FIU will also pursue private resources such as those from the emerging commercial Space enterprise.



### **Biomedical & Biomedical Engineering Research**

FIU continues to grow its world-class biomedical research program toward three areas of excellence: engineered tissue model systems; diagnostic imaging and sensor systems; and therapeutic and reparative neurotechnology. These priorities can be harmonized with funding opportunities within federal research agencies such as NIH, NSF and DOD. The interdisciplinary nature of biomedical engineering affords the discipline a tremendous opportunity to bring forth advances in technological development and new discoveries to foster improved quality of life. Additionally, with a growing veteran population and others experiencing such conditions as

traumatic brain injury, post-traumatic stress disorder and sensory loss of those learning to live with prosthetics, FIU's strong leadership and recent outstanding hires will accelerate the university's research strides toward understanding, rehabilitation, and recovery. FIU will work with Congress and relevant agencies to identify federal research programs and budget resources that compliment FIU's initiatives in biomedical research.



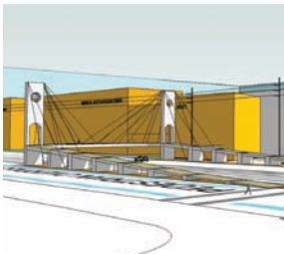
### **STEM Education**

As the largest producer of STEM degrees for minorities, FIU is particularly well positioned to play a major role in addressing the challenges facing our nation in preparing a greater number of STEM graduates, diversifying the STEM workforce, and developing and implementing the curricula and technologies that will best prepare students for STEM careers. Through the launch of its STEM Transformation Institute, FIU has developed considerable expertise in curricula transformation, teacher education, pipeline development, an aggressive collaboration with Miami-Dade County Public Schools, peer-to-peer mentoring and other techniques that are successful in expanding the number and quality of STEM graduates. FIU will continue to pursue major collaborative research opportunities for expansion of its STEM activities on campus and in K-12. Additionally, FIU seeks to be a leader in the national STEM dialogue, advocating for more focused federal investments directed at underrepresented minorities.



### **Extreme Events Institute**

The Extreme Events Institute will advance research and state-of-the-art practice toward improving mitigation and reducing risks of severe natural events such as hurricanes and storm surges, building upon the strengths of its International Hurricane Research Center (IHRC) and the Wall of Wind testing facility—the only one of its kind in the world capable of generating enough power to mimic a category 5 hurricane. The Center also has extensive computation and data collection resources that are used to model storm surges, predict inland flooding, and analyze potential damage to the built environment. Following Superstorm Sandy, Congress and the administration are keenly interested in research and development into extreme weather events. FIU seeks opportunities from NOAA and NSF and seeks to influence possible legislation reauthorizing programs at NOAA to direct programmatic funding to entities such as the Center.



### **UniversityCity Prosperity Initiative**

FIU plans to build upon its vision for a more livable, connected and technological community both in and around the FIU campuses and South Florida region. UniversityCity, a catalytic project of national significance, will integrate FIU into its surrounding neighborhoods, including the City of Sweetwater, with enhanced access to transportation, housing, shopping and community life that will provide an economic boost to the region. Along with its partners the City of Sweetwater, Miami-Dade Expressway Authority, the State of Florida, IBM and Miami-Dade County, the alliance will also pursue deployment of Intelligent Transportation Systems to impact congestion in the entire region. FIU seeks support of the U.S. Department of Transportation in implementing the UniversityCity vision.

### **For more information**

government.fiu.edu  
federal@fiu.edu  
305-348-3505



# Financial Aid

**F**ederal financial aid investments at FIU make a critical impact in South Florida, allowing individuals to pursue their dreams while our region gains college-educated professionals. More than 17,000 FIU students currently receive Pell grants — the fourth largest number of recipients among public universities in the United States — with 69 percent of these students receiving the maximum award based on an expected family contribution of \$0. Eighty-four percent (84%) of financial aid recipients at FIU are First Generation college students. Additionally, more than 20,000 FIU students receive Stafford loans. These students would pay an average of \$3,400 more over the life of a 10-year loan should interest rate increases double in the summer of 2013.

The projected maximum Pell grant for 2013-2014 of \$5,645 must be protected and interest rate increases on Stafford loans forestalled since both programs are a critical lifeline to higher education for low-income families in South Florida and at FIU. Research by our national partner, CEO's for Cities, shows that by increasing local baccalaureate degree production by just 1 percent, the South Florida region would benefit from an expected economic impact of \$1.7 billion. This is only possible with continued federal financial aid investments.

## Snapshot of Financial Aid at Florida International University

Florida International University is one of the Top 10 largest public universities by campus enrollment. Almost 50,000 students are enrolled this current academic year. Reductions to federal financial aid programs would disproportionately affect FIU's students, many of whom are classified in the categories of highest need, due to their heavy reliance on aid to attend school.

## Federal Pell Grant Program Basic Facts (AY 2012-2013)

- **17,117** students depended on the federal Pell grant (approximately 36 percent of our total student population) to help pay for their studies last year. This accounts for a total of **\$77,143,267.60** in aid.
- **11,858** students (69.3 percent of students receiving Pell) qualify to receive the maximum Pell award based on expected family contributions (EFC) of \$0 (category of highest need).
- **8,401** Pell recipients earned a B average or higher (3.0+) in Fall 2012.
- **12,705** Pell recipients are enrolled full time at FIU.
- **14,425** or 84.3 percent of students receiving Pell are First Generation in college.

FIU ranks **No. 4** in the United States among public universities in terms of Pell grant recipients.



## Estimated Family Contribution of FIU Pell Recipients

Est. Family Contribution	\$0	\$1 - \$1,000	\$1,001 - \$2,000	\$2,001 - \$3,000	\$3,001 - \$4,000	\$4,001 - \$4,996
Annual Award Amount	\$5,550	\$4,600 - \$5,500	\$3,600 - \$4,500	\$2,600 - \$3,500	\$1,600 - \$2,500	\$602 - \$1,500
Students	9,391	3,091	1,585	1,262	1,013	775

### Pell Recipients by Income Level

Income Level	by Number
0 - 20,000	9,768
20,001 - 30,000	2,913
30,001 - 40,000	1,876
40,001 - 50,000	1,190
50,001 - +	1,192
Blank	78
<b>Grand Total</b>	<b>17,117</b>

### Enrollment of Pell Recipients

Full Time	12,705
Three-Quarter Time	2,483
Half-time	1,611
Less than Half-time	312
Not Enrolled	6
<b>Grand Total</b>	<b>17,117</b>

### Percentage Receiving Pell by Start Level

Freshman	17%
Sophomore	13%
Junior	38%
Senior	32%
<b>Grand Total</b>	<b>100%</b>

### Count of Pell Recipients by Enrolled Credits

Credit Hours	Number Enrolled
0	
1	6
2	
3	262
4	33
5	40
6	1158
7	282
8	197
9	1729
10	423
11	333
12	5693
13	2178
14	1398
15	1978
16-27	1388
<b>Grand Total</b>	<b>17,117</b>

### First Generation Pell Recipients by EFC

EFC	Number of Recipients
0	8,845
1-1000	2,268
1001-2000	1160
2001-3000	858
3001-4000	707
4001-5000	587
<b>Grand Total</b>	<b>14,425</b>

### Pell Recipients by GPA

GPA	Number of Recipients
0.0-1.0	419
1.0-1.9	1,394
2.0-2.9	6,903
3.0-3.9	8,208
4.0+	193
<b>Grand Total</b>	<b>17,117</b>

### Other 2011-12 Highlights

#### Stafford Loans

- 21,170 students currently receive Stafford Loans
- \$16,621 is the average loan indebtedness

#### Perkins Loans

- 94 students currently receive Perkins Loans

#### Work Study & Other Federal Aid Programs

- 656 students take part in the Federal Work Study Program
- 21,170 students receive funds from the Federal Direct Loan Program (FDLP)
- 1,458 students are recipients of the Supplemental Education Opportunity Grant (SEOG)

#### Impact of Summer Pell Reduction

- Summer 2010 5,479 students received \$7,959,050
- Summer 2011 6,900 students received \$10,874,061

A Department of Education IPEDS analysis of 2011-2012 data found that FIU's overall cost of attendance was \$10,415. This places FIU No. 4 in the SUS in affordability after the University of West Florida, FAMU and University of North Florida.

The information above is current as of Fall 2012

## Top 20 Public and Private U.S. Educational Institutions in Terms of Pell Grant Recipients

Rank	College	Classification	Location	Number of Pell Recipients	Enrollment	Pell Dollars Received
1	University of Phoenix	For-Profit 4-year	Online Campus (HQ= Phoenix, Arizona)	265,238	307,871	\$942,786,492
2	Ashford University	For-Profit 4-year	Multiple Campuses (HQ= Clinton, Iowa)	86,199	74,596	\$294,536,915
3	Miami Dade College	Public 2-year	Miami, Florida	47,746	70,350	\$172,014,271
4	Kaplan University	For-Profit 4-year	Multiple Campuses (HQ= Davenport, Iowa)	42,697	56,606	\$146,257,791
5	Houston Community College	Public 2-year	Houston, Texas	32,818	63,015	\$101,082,451
6	Liberty University	Private 4-year	Lynchburg, Virginia	29,952	64,096	\$96,834,377
7	Lone Star College System	Public 2-year	Woodlands, Texas	27,540	63,029	\$87,685,695
8	Arizona State University	Public 4-year	Phoenix, Arizona	26,129	60,169	\$100,029,068
9	Tarrant County College District	Public 2-year	Fort Worth, Texas	23,751	50,062	\$74,652,320
10	American Public University System	For-Profit 4-year	Online (HQ= Charles Town, West Virginia)	23,374	50,838	\$57,599,730
11	University of Central Florida	Public 4-year	Orlando, Florida	21,092	59,767	\$76,573,614
12	Florida International University*	Public 4-year	Miami, Florida	20,713	47,966	\$77,243,156
13	Ohio State University	Public 4-year	Columbus, Ohio	15,174	56,387	\$52,743,817
14	Northern Virginia Community College	Public 2-year	Annandale, Virginia	13,191	50,044	\$43,340,224
15	University of Florida	Public 4-year	Gainesville, Florida	11,846	49,589	\$46,797,957
16	University of Texas at Austin	Public 4-year	Austin, Texas	11,200	52,186	\$46,376,261
17	Texas A&M University	Public 4-year	College Station, Texas	9,560	53,337	\$37,302,793
18	Michigan State University	Public 4-year	East Lansing, Michigan	9,547	48,906	\$38,941,860
19	University of Minnesota	Public 4-year	Minneapolis, Minnesota	8,566	51,853	\$31,963,599
20	Walden University	For-Profit 4-year	Online Campus (HQ= Minneapolis, MN)	6,872	48,982	\$21,125,586

\* Florida International University ranks number 20 in terms of number of Pell grant recipients and 9th in terms of total Pell awards.

Source: Federal Student Aid Data Center (US Department of Education)

Florida ranks **No. 3** in the United States in  
Pell grant recipients and Pell grant dollars received: 674,679  
students receive \$2.3 billion annually.

## Federal Student Aid Programs 2012-13

### FL CONGRESSIONAL DISTRICT 18: PATRICK MURPHY

	Number of Awards	Dollar Amount
Pell Grants:	9,957	\$32,646,347
<b>Campus-Based Programs:</b>		
FSEOG	507	\$315,400
FWS	208	\$347,582
Perkins Loans	-	\$-
<b>Federal Loan Programs:</b>		
Number of Loans	Total Loan Volume	
Subsidized	2,883	\$9,115,402
Unsubsidized	1,516	\$4,616,869
PLUS	26	\$76,997
Grad PLUS	-	\$-

### FL CONGRESSIONAL DISTRICT 20: ALCEE HASTINGS

	Number of Awards	Dollar Amount
Pell Grants:	23,996	\$85,574,789
<b>Campus-Based Programs:</b>		
FSEOG	2,609	\$1,622,960
FWS	343	\$578,468
Perkins Loans	53	\$100,000
<b>Federal Loan Programs:</b>		
Number of Loans	Total Loan Volume	
Subsidized	24,997	\$98,055,385
Unsubsidized	24,594	\$127,688,895
PLUS	1,308	\$8,435,902
Grad PLUS	40	\$605,991

### FL CONGRESSIONAL DISTRICT 22: LOIS FRANKEL

	Number of Awards	Dollar Amount
Pell Grants:	64,431	\$209,590,752
<b>Campus-Based Programs:</b>		
FSEOG	4,018	\$2,499,799
FWS	1,815	\$3,033,161
Perkins Loans	1,028	\$1,916,918
<b>Federal Loan Programs:</b>		
Number of Loans	Total Loan Volume	
Subsidized	32,836	\$131,336,637
Unsubsidized	27,503	\$134,675,174
PLUS	1,565	\$20,376,367
Grad PLUS	289	\$4,616,058

### FL CONGRESSIONAL DISTRICT 23: DEBBIE WASSERMAN SCHULTZ

	Number of Awards	Dollar Amount
Pell Grants:	5,525	\$20,009,113
<b>Campus-Based Programs:</b>		
FSEOG	965	\$602,315
FWS	2,330	\$3,887,657
Perkins Loans	835	\$1,555,000
<b>Federal Loan Programs:</b>		
Number of Loans	Total Loan Volume	
Subsidized	23,147	\$191,457,263
Unsubsidized	22,033	\$285,486,306
PLUS	414	\$6,964,631
Grad PLUS	4,859	\$122,514,827

### FL CONGRESSIONAL DISTRICT 24: FREDERICA WILSON

	Number of Awards	Dollar Amount
Pell Grants:	50,636	\$182,932,326
<b>Campus-Based Programs:</b>		
FSEOG	5,481	\$3,408,090
FWS	2,941	\$4,905,254
Perkins Loans	1,030	\$1,919,316
<b>Federal Loan Programs:</b>		
Number of Loans	Total Loan Volume	
Subsidized	22,102	\$109,522,939
Unsubsidized	21,119	\$137,076,842
PLUS	1,874	\$25,653,515
Grad PLUS	1,967	\$46,679,907

### FL CONGRESSIONAL DISTRICT 25: MARIO DIAZ-BALART

	Number of Awards	Dollar Amount
Pell Grants:	33,385	\$120,497,353
<b>Campus-Based Programs:</b>		
FSEOG	2,676	\$1,665,357
FWS	1,270	\$2,123,646
Perkins Loans	322	\$600,000
<b>Federal Loan Programs:</b>		
Number of Loans	Total Loan Volume	
Subsidized	27,912	\$141,983,402
Unsubsidized	22,213	\$134,250,820
PLUS	737	\$5,444,665
Grad PLUS	2,496	\$35,022,694

### FL CONGRESSIONAL DISTRICT 26: JOE GARCIA

	Number of Awards	Dollar Amount
Pell Grants:	19,327	\$65,526,537
<b>Campus-Based Programs:</b>		
FSEOG	845	\$526,820
FWS	526,820	\$345,580
Perkins Loans	-	\$-
<b>Federal Loan Programs:</b>		
Number of Loans	Total Loan Volume	
Subsidized	9,511	\$25,943,997
Unsubsidized	8,921	\$34,027,559
PLUS	558	\$3,348,254
Grad PLUS	-	\$-

### FL CONGRESSIONAL DISTRICT 27: ILEANA ROS-LEHTINEN

	Number of Awards	Dollar Amount
Pell Grants:	12,815	\$46,861,221
<b>Campus-Based Programs:</b>		
FSEOG	2,848	\$1,771,865
FWS	1,388	\$2,318,508
Perkins Loans	2,111	\$3,928,314
<b>Federal Loan Programs:</b>		
Number of Loans	Total Loan Volume	
Subsidized	11,845	\$58,310,283
Unsubsidized	10,515	\$69,642,042
PLUS	1,288	\$23,569,200
Grad PLUS	1,719	\$41,263,659

(Source: NAICU.EDU, Federal Student Aid Programs)

# aquarius

**A**quarius Reef Base (ARB) in Key Largo, Florida, is a unique underwater ocean science and diving facility deployed on the barrier reef within the Florida Keys National Marine Sanctuary (FKNMS). This facility allows extended underwater manned science and training missions by providing safe living and working support at the higher pressures of the underwater environment. No other such facility exists in the world.

FIU recently received authorization from NOAA to manage operations and maintenance of the facility. The grant agreement guarantees continued funding for the ARB for the first six months of FY 2013. FIU plans to transition to operating the Aquarius

Reef Base under a new business model that will support the operations of the facility with a combination of funding from federal agencies (including NOAA), educational programs, private sector contracts and philanthropic donations. NOAA's National Undersea Research Program, including Aquarius, was not included in the president's fiscal 2013 proposal; however, NOAA recognizes that the Aquarius Reef Base is a unique and valuable asset to the scientific community.

## State and Local Impact

The Aquarius Reef Base advances FIU's vision for the entire Florida Keys by allowing researchers to better understand the South Florida marine environment and the critical

habitat of the coral reefs of the National Marine Sanctuary of the Florida Keys. The continuation of operations at the ARB will create research opportunities not only for FIU, but for other university partners in marine science research. Research conducted at the facility contributes greatly to our knowledge of the functioning of coral reef ecosystems in general, and the FKNMS in particular. This knowledge is proving vital for predicting the response of these systems to environmental change and for managing the important assets of the FKNMS.

Aquarius is the only undersea laboratory that has been monitoring one of the great marine disasters in history – the rapid decline of the coral reef ecosystem.





### National Significance

ARB consists of the Aquarius underwater laboratory and habitat, anchored to the bottom on the barrier reef, as well as vessels and shore-based facilities that provide the technical and logistical support for research, training and exploration in Aquarius and the contiguous marine environment. ARB provides unparalleled means to study coral reefs and the ocean, test state-of-the-art undersea technology, train astronauts, including those from private industry, and specialized divers, and to engage the imagination of students and the public across the globe in ocean science, coral reefs, conservation, and underwater technology.

Since 1991, ARB has supported more than 269 science, training and exploration missions, 117 involving residency in Aquarius, the underwater habitat and laboratory, producing more than 550 peer-reviewed scientific publications along with numerous

popular articles and educational programs. Perhaps the greatest scientific value of Aquarius is that it and its surrounding waters has become a valuable laboratory that has been monitoring one of the great marine disasters in history – the rapid decline of the coral reef ecosystem. Some scientists predict that if conditions persist, the next generation will see the extinction of an entire worldwide marine ecosystem.

NASA has used Aquarius for 11 years as an extreme environmental analog to space flight. Aquarius missions provide unparalleled mission training experience for astronauts, mission controllers, planners and scientists. The most recently completed mission has fundamentally answered questions pertaining to asteroid exploration.

### Recommendations

FIU seeks to continue a strong partnership with NOAA, NASA and other interested agencies for the foreseeable future enabling FIU to develop a new business model to fund operations at Aquarius. The new business model will include research and education activities supported by federal, state and local government funding, as well as fees for services from science and engineering teams from government and industry that use the facility. Donations from private benefactors also will be key to ensuring the future of Aquarius.

FIU is the ideal partner for NOAA given our close proximity to the ARB and our long-standing research efforts in the Florida Keys. FIU's knowledge base and partnerships with other marine science research institutions make FIU the ideal value-added partner for the NOAA-ARB project. FIU's leadership will safeguard the ARB's capability as a research laboratory to greatly enhance our efforts to ensure the Florida Keys coastal environment will continue to be an important and valuable part of our region's natural heritage.

**Of Particular Interest:** The current agreement between NOAA and FIU funds the operation and maintenance of Aquarius for the first six months of FY 2013. To ensure continuity of this important research, FIU requests support from Congress in

- securing additional funding for the rest of FY 2013 and through FY 2014
- maintaining ARB as a federally owned asset to protect FIU and its partners from unforeseen liabilities that may arise in the future
- protecting RESTORE Act Funds: FIU will seek to partner with state and federal authorities to use the unique capabilities of the ARB to monitor present and future potential environmental impacts on the Florida Keys and the reef system related to the Macondo oil spill.



The Aquarius Reef Base advances research on the sustainability of coastal ecosystems, monitors the health of the Florida Keys and ultimately their relation to the environmental and economic health of the Southeast.

# biomedical & Biomedical Engineering Research

**F**IU seeks to grow its world-class biomedical research program to meet the evolving needs of our country and the world. The College of Engineering and Computer Science, its Department of Biomedical Engineering and the recently accredited Herbert Wertheim College of Medicine are poised to be internationally recognized for research excellence and innovation in clinical medicine and biomedical industry applications.

The vision for biomedical engineering identifies three significant areas of research excellence: engineered tissue model systems; diagnostic imaging and sensor systems; and therapeutic

and reparative neurotechnology. Present research within the Adaptive Neural Systems Laboratory is focused on the design and development of technology that offsets the effects of limb amputation, orthopedic injury and disease and neurodegenerative diseases affecting the loss of functionality. Indeed, the interdisciplinary nature of biomedical engineering affords the discipline a tremendous opportunity to bring forth advances in technological development and new discoveries to foster improved quality of life.

With a growing veteran population and others experiencing such conditions as traumatic brain injury, post-traumatic

stress disorder, and sensory loss of learning to live with prosthetics, FIU's strong leadership and its recent outstanding hires will accelerate research at FIU to make strides toward understanding rehabilitation and recovery. This area within biomedical research is

With a growing veteran population and others experiencing traumatic brain injury, sensory loss and learning to live with prosthetics, FIU provides quality-of-life solutions.



receiving considerable attention including potentially new research opportunities emerging within DOD, DARPA, the Veterans Administration and the National Institute of Neurological Disorders and Stroke (NINDS).

Another exciting project presently supported by NIH is the development of a hand-held optical imager for breast cancer. Given the strong partnership with Wertheim College of Medicine and the College of Nursing and Health Sciences, the success of such a device could have major ramifications for treatment within Florida especially as it relates to the disproportionately higher share of the cancer burden experienced among minority populations.

Efforts will focus on the steps necessary for enhancing the research portfolio within the College of Medicine and determining which NIH Institutes/Centers/Programs can be targeted toward its success.

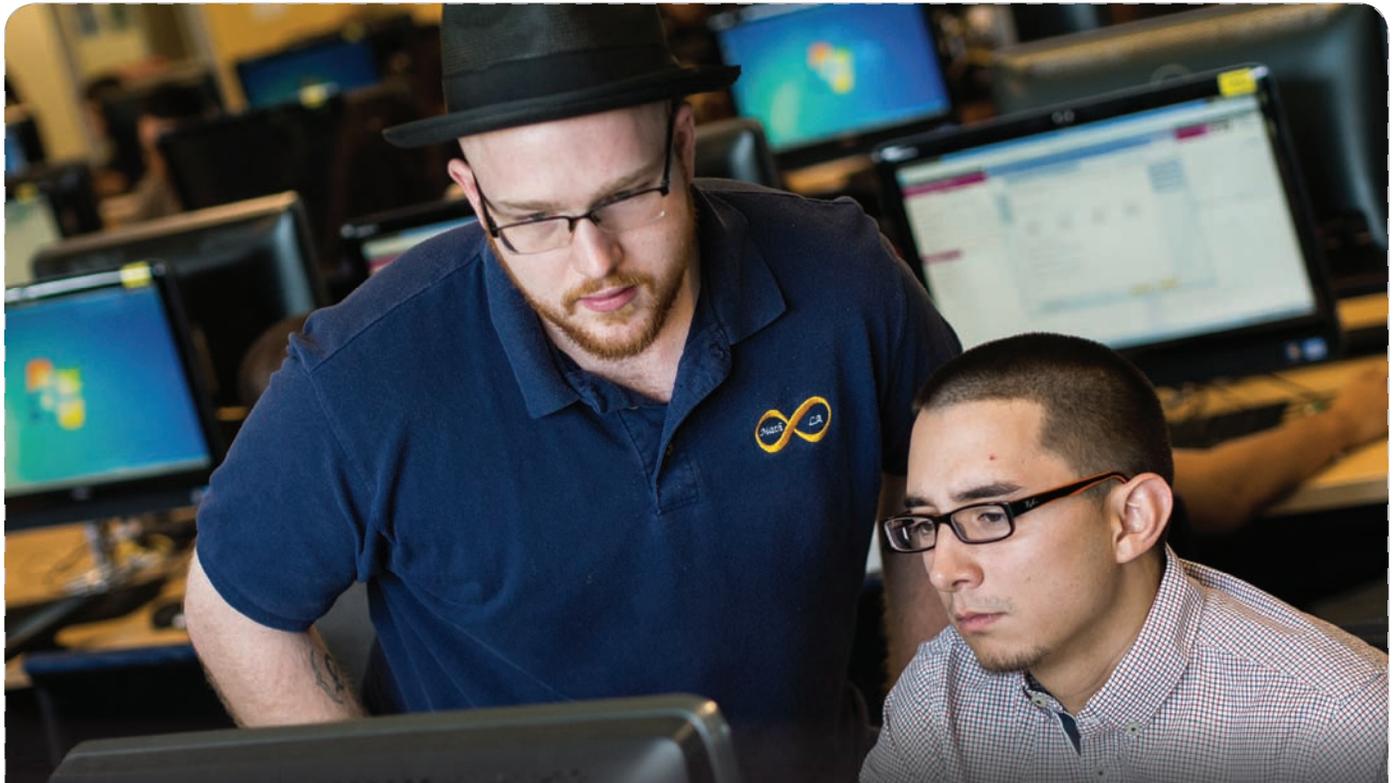
## Recommendations

FIU seeks to identify federal research programs and budget resources that complement FIU's initiatives in biomedical and bioengineering research and also to identify key administrative leaders to visit the campus.

## Of particular interest

- Continued funding from DARPA's Defense Science Office
- Funding from new initiatives at DARPA for potential continuation of the Reliable Neural-Interface Technology from the Microsystems Technology Office
- Programs at NIH, especially NIBIB, NINDS, NCI, and NICHD
- NSF's Directorates of Engineering and Computer Sciences
- DOD Congressional Directed Medical Research Program
- Working more closely with the Department of Veterans Administration and exploring joint appointments from hospitals in Miami and Tampa area





# stem

With 7,500 current undergraduate students majoring in STEM fields, FIU is a national leader in preparing a greater number of diverse scientists and engineers.

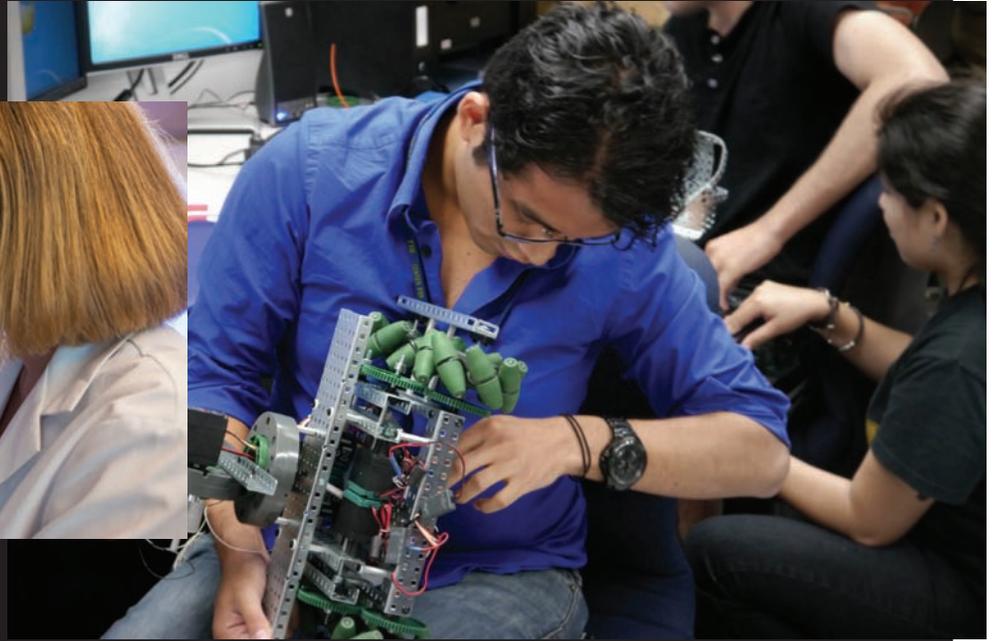
**F**IU is particularly well-positioned to play a major role in addressing the challenges facing our nation in preparing a greater number of STEM graduates, diversifying the STEM workforce and developing and implementing the curricula and technologies that will best prepare students for STEM careers. FIU currently has 7,500 undergraduate students majoring in STEM fields. FIU is the largest producer of STEM degrees for Hispanics and one of the top producers for all minorities. FIU produced 1,622 STEM graduates in 2011-12, including 914 Hispanics.

FIU is expected to remain the largest producer of such degrees well into the future. It is particularly strong in physics and engineering programs for underrepresented minorities.

FIU has significant expertise in a broad range of STEM matters, including curricula transformation, teacher education, pipeline development, an aggressive collaboration with Miami-Dade County Public Schools, a cutting-edge learning assistant mentoring and support program, and other techniques that are successful in expanding the number and quality of

STEM graduates. FIU is also engaged in continuing research on learning styles and techniques that work. A major and unique contribution of FIU is its leadership in STEM education research, with funding from NSF, Howard Hughes Medical Institute, and the U.S. Department of Education, among others.

In 2012, FIU established the STEM Transformation Institute—an entity that focuses on state-of-the-art education research, implementing collaborative learning models and innovative pathways to increase the number,



diversity and excellence in preparation of STEM graduates and teachers. FIU, through its Achieving Community Collaboration in Education and Student Success initiative (ACCESS) is closely involved with the Miami-Dade County Public School system through projects that reach more than 25,000 public school students annually. Among the programs are dual enrollment, undergraduate support for education and informal education in elementary and secondary schools, and leadership training for principals.

As a leader in STEM, especially attracting and training Hispanics and other underrepresented groups to the disciplines, FIU will continue to pursue opportunities for refinement and expansion of its STEM activities. FIU will: (a) support policy decisions and legislation that make underrepresented minorities a major thrust of STEM efforts that reflect research-driven approaches and interventions and that promote strong and direct collaborations with school systems and that expand research that focuses on

outcomes; (b) seek a continuing role in federal policy discussions relating to STEM initiatives, especially in urban areas; (c) submit new proposals to NSF and other federal agencies in response to solicitations in the STEM area; (d) continue to partner with industry and federal agencies in providing pipelines of underrepresented graduates in STEM fields; and (e) seek additional venue for participation in STEM policy development.

## **Recommendations**

- Support funding, legislation and Administrative action to advance STEM education with a particular emphasis on urban underrepresented minority outreach, including the release of a federal strategic plan on STEM education investments.
- Support STEM federal initiatives aimed at promoting direct collaborations with local public school systems to help better prepare students for college-level work.
- Support FIU's major collaborative grant initiatives with Miami-Dade County Public Schools
- Support the creation of a Presidential Higher Education Commission on STEM Education, as recommended by the President's Council of Advisers on Science and Technology

# extreme Events Institute



As more Americans move to areas that are vulnerable to flooding and natural disasters, we need better strategies to reduce risk and mitigate damage in advance.

**T**he Extreme Events Institute encompasses all of the severe weather capabilities of Florida International University (FIU) under one umbrella organization and builds on the organizational strengths of existing Centers like the International Hurricane Research Center (IHRC). The IHRC houses state-of-the-art facilities that enable research to reduce hurricane damage and loss of life through more effective mitigation techniques. The Center also has extensive computation and data collection resources that are used to model storm surges, predict inland flooding, and analyze potential damage to the built environment. Among many practical resources, FIU has created a Hurricane Loss Model that is employed in the State of Florida and

could be used in other coastal states for risk reduction.

FIU's Wall of Wind testing facility is the only one of its kind in the world capable of generating enough power to mimic large-scale, category 5 hurricanes. This testing facility can help us better understand how various storms affect buildings so that we can design and build more resilient structures.

#### **State and National Significance**

Florida and the Gulf Coast are especially vulnerable to hurricanes and extreme events, and the Extreme Events Institute is well positioned in the state and nation to address these issues. Following Superstorm Sandy, it is clear that we need to develop better models to address

coastal flooding that take into account wave and tidal factors. As more and more people move to areas of the country that are vulnerable to coastal flooding, we need a better understanding of all of the factors that contribute to damage. Given its unique strength in this area, FIU's Extreme Events Institute can assist Congress and the administration on program development.

#### **International Importance**

Storm surges and extreme weather events are not just a national issue—they can also devastate multiple regions throughout the world; especially our neighboring countries in the Caribbean and Central America.



## FIU's Comparative Strengths:

- Storm Surge Modeling
- Windstorm Insurance Public Loss Modeling
- Wall of Wind Testing
- Disaster Risk Reduction in the Americas

FIU is also working with USAID on disaster risk reduction techniques to help stem the loss of life generated by violent storms. Rather than simply respond to natural disasters, FIU seeks to address vulnerabilities before storms hit so that international communities are not torn apart physically, socially and politically by a major weather event.

### FIU Funding and Goals

FIU's Extreme Events Institute has developed this research through grants from agencies like the National Science Foundation (NSF), the Department of Energy (DOE), the United States Agency for International Development (USAID), and the National Oceanic

and Atmospheric Administration (NOAA). Researchers will continue to engage NSF and may pursue a multi-disciplinary Science Technology Center in the near future. Researchers at the Institute may also seek to help the U.S. understand and better prepare for storms by working with the Federal Emergency Management Agency (FEMA) to develop stronger public hurricane loss models for states, the Centers for Disease Control (CDC) to explore the interaction between disasters and health, and the Department of Defense (DoD) to use the Wall of Wind to test materials to better protect federal structures in vulnerable areas from catastrophic loss.

### Recommendations for Congress

- Support funding at NSF and NOAA for research into extreme weather events, with a focus on risk reduction through better storm surge and coastal flooding models.
- Support programs at NIST and FEMA that seek to minimize loss to the human and built environment from extreme events and refocus programs at USAID's Foreign Disaster Assistance programs on disaster risk reduction to help avoid displacement.

# university City

## Prosperity Initiative



**T**hroughout South Florida, cities and neighborhoods are actively seeking to redefine themselves to align more closely to their human and material assets. The UniversityCity Prosperity Project Initiative seeks to begin such a transformation effort and envisions an economically robust, sustainable, affordable, and equitable community centered around Florida International University as Miami-Dade County's Anchor Public Institution for the global knowledge economy.

As FIU develops a new engagement strategy, it must find a way to ensure that the entire community can improve as a consequence of a civic-minded, forward-facing, and energized university that sees itself as a solutions center for 21st century challenges. FIU, in cooperation with greater Miami-Dade, the City of Sweetwater, the State of Florida and private partners, will lead the planning for UniversityCity and will lend its expertise in applying

new technologies to the movement of people and goods.

An Advanced Transit Oriented Development zone (ATOD) will create a best-practice model for infrastructure improvements that help to shift trips away from private vehicles, while simultaneously supporting the economic growth related to a major public research university and adjacent small city. The ATOD strategically weaves together: vibrant and mixed-use pedestrian pathways and pedestrian bridges; high quality public spaces, Main Street, and multi-modal transit station environments; innovative transit greenways and mixed-mode streets; shared community transit local feeder vehicles; private development projects that establish higher mixed-use residential densities; and an Advanced Transit and Multimodal Station (ATMS) adjacent to major expressways on FIU's campus.

A catalytic project of national significance, FIU and partners will enhance access to transportation, develop IT solutions and transform neighborhoods to boost economic development.

### **Informed Traveler Program and Applications (ITPA)**

The UniversityCity program will use the Informed Traveler Program and Applications (ITPA) to provide personalized, accurate and timely information and advice regarding the most efficient and cost-effective travel paths for consumers. The software is predictive in nature, allowing users to make better travel decisions even before they get in their private vehicles, and offering ITPA users express transit routes and the potential of faster parking in smart garages. ITPA gives travelers the information to change routes or take

transit instead of following a reflective pattern of automotive travel.

The ITPA uses a smartphone-based interface to provide information about whether to use transit, delay the start of a trip to avoid congestion, or take an alternate route to avoid construction or accident delays. The system will work on any smart phone, and will include audio and visual capabilities similar to standard car GPS devices, but with intelligence behind the system that considers user needs, situational conditions and safety concerns.

### **State and Local Impact**

Significant benefits include reductions in congestion, travel time, accidents, vehicle miles travelled, and travel costs for businesses and households. This is a down-to-earth, near-term project addressing systemic and urgent problems in western Miami-Dade. Communities such as Sweetwater and the City of Doral (Doral) have used annexation and incorporation as a strategy to revitalize themselves and give shape to new opportunities for their residents. The rapid growth and expansion of nearby FIU gives these cities and their neighbors an unprecedented opportunity to build new partnerships, generate fresh approaches to problem-solving, and improve their quality of life. This sustainable prosperity plan of FIU, Sweetwater, their partners and other participants fosters a more seamless campus-community dynamic that helps fulfill the need for talent development, job creation, sustainability, enhanced public transportation, and new forms of residential and neighborhood development. A key element of this partnership will be the future economic impact of FIU's new research commercialization and entrepreneurship efforts connected to its new Academic Health Center.

### **National Significance**

The UniversityCity Prosperity Project will maximize the capacity of infrastructure and reduce the need to build additional highway capacity. Congestion costs U.S. commuters 4.2 billion hours and 2.8 billion gallons of fuel each year, costing the U.S. economy up to \$200 billion per year. This project will reduce congestion and enable transportation agencies to collect the real-time data needed to measure and improve the performance of the transportation system. Moreover, the success of ITPA will enhance FIU's efforts to attract industry and entrepreneurship into this area.

ITPA components will work together with previous intelligent transportation systems (ITS) in place from local transportation agencies to substantially reduce travel time and travel stress. This robust, scalable, flexible platform will support further deployment throughout the region and the nation as an ultimate objective.

UniversityCity will demonstrate the connections between sustainability, innovative mobility, technology transfer, new urbanism/smart growth and equitable economic prosperity led by a major public research university. In a globally competitive knowledge economy, the project points the way forward.

### **Conclusion**

As FIU develops a new engagement strategy and expands the social and economic applicability of its research and scholarly enterprises, it must find a way to ensure that the entire community can improve as a consequence of a civic-minded, forward-facing, and energized university that sees itself as a solutions center for 21st century challenges. The UniversityCity Prosperity Project will help transform the FIU/City of

Sweetwater relationship from one of friendly neighbors to a truly unique and collaborative relationship that will create a growing and innovative community.

FIU requests the support of the delegation in facilitating discussions with the U.S. Department of Transportation to identify funding opportunities for the implementation of the UniversityCity plan. In particular, FIU seeks to apply intelligent multi-modal transportation concepts to UniversityCity planning and implementation, and to the broader Miami-Dade region transportation system.

### **Recommendations**

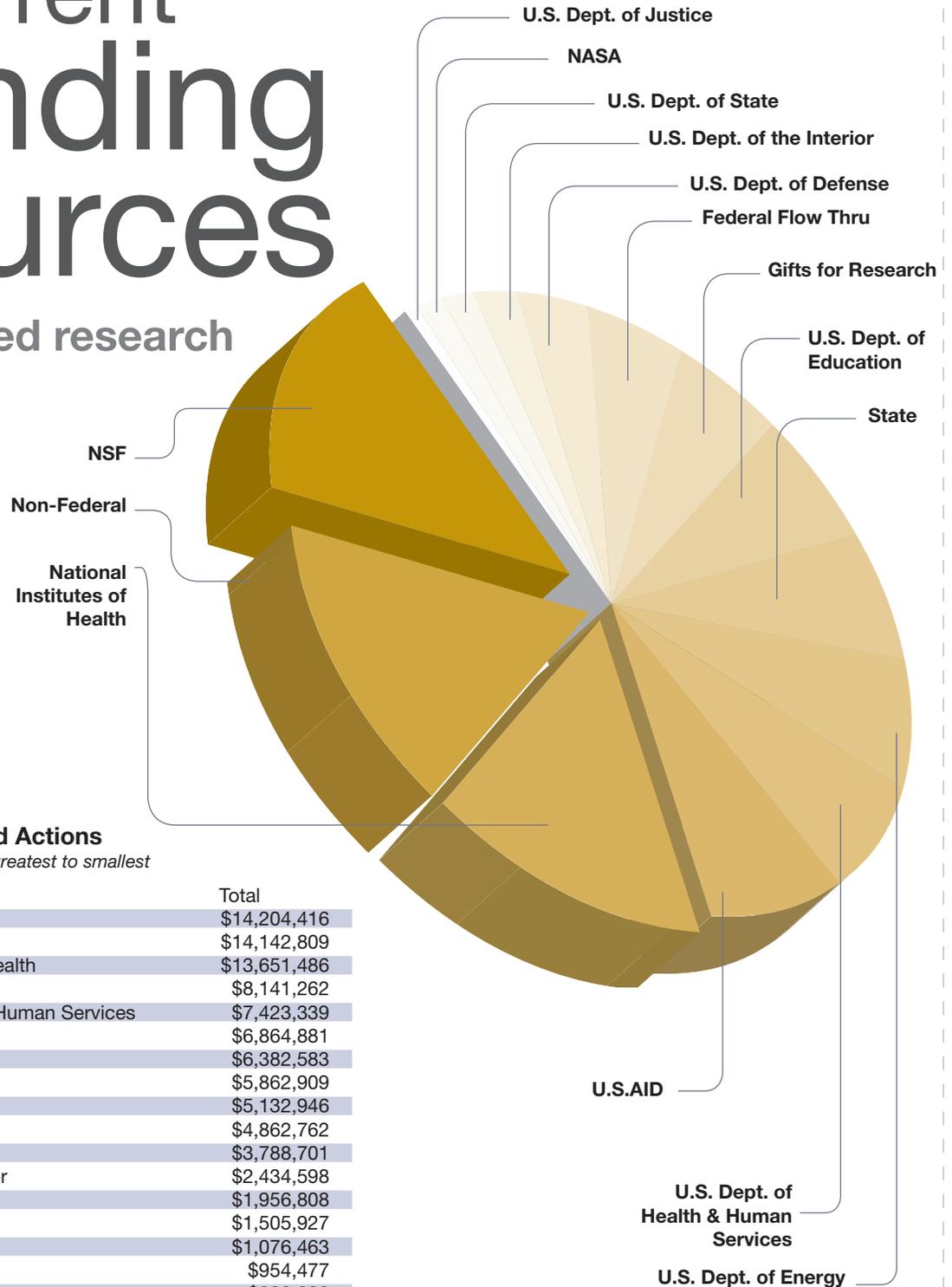
FIU seeks to further explore with the U.S. Department of Transportation identifying funding opportunities for the implementation of the University City plan in line with MAP-21 Authorization goals and appropriated funds. In particular:

- Expedited, closed competition for programs of regional, national significance as appropriated (formerly TIGER)
- Seek DOT research collaboration to apply intelligent multi-modal transportation concepts to UniversityCity planning and implementation, and to the broader Miami-Dade region transportation system.

FIU will ask the delegation and state leaders to support funding for an Informed Traveler Program development as the MAP-21 highway legislation is implemented.

# Current Funding Sources

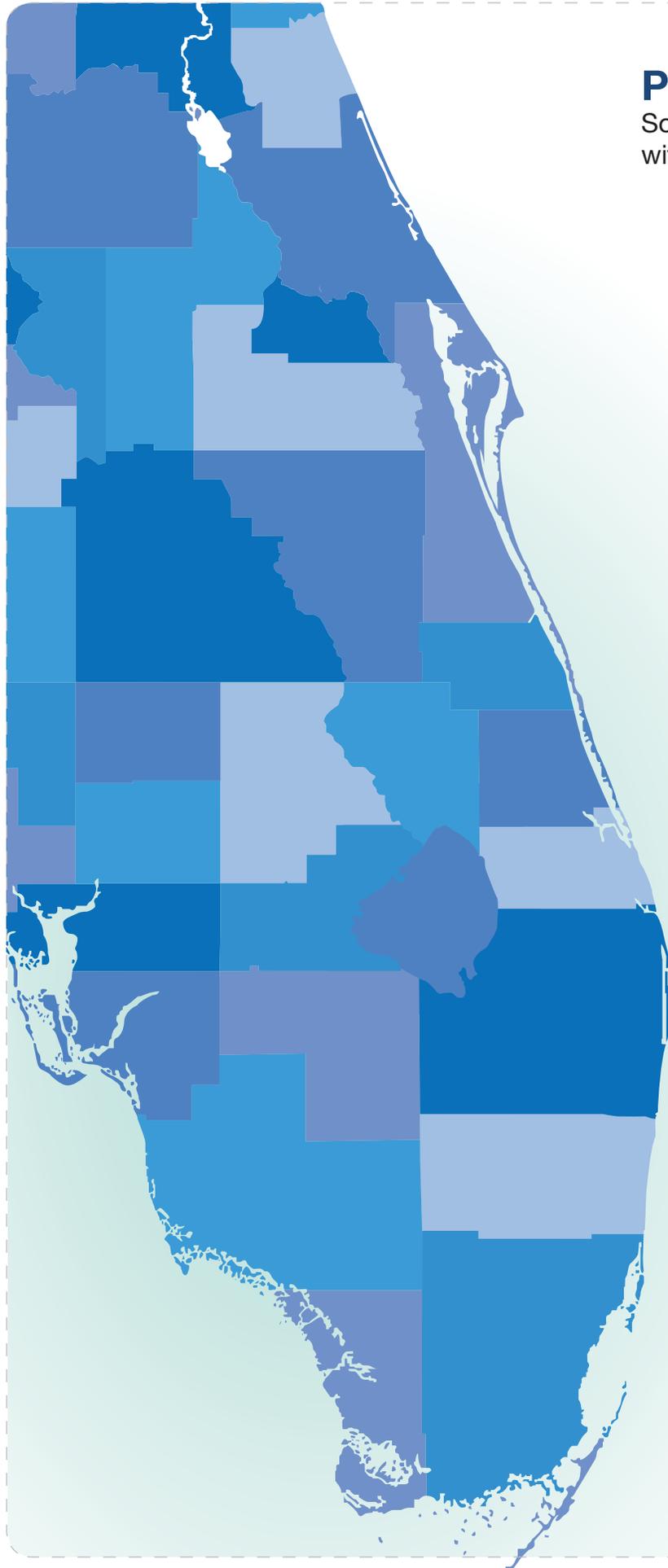
sponsored research



## Summary of Award Actions

Amounts are listed from greatest to smallest

	Total
NSF	\$14,204,416
Non-Federal	\$14,142,809
National Institutes of Health	\$13,651,486
U.S.AID	\$8,141,262
U.S. Dept. of Health & Human Services	\$7,423,339
U.S. Dept. of Energy	\$6,864,881
State	\$6,382,583
U.S. Dept. of Education	\$5,862,909
Gifts for Research	\$5,132,946
Federal Flow Thru	\$4,862,762
U.S. Dept. of Defense	\$3,788,701
U.S. Dept. of the Interior	\$2,434,598
U.S. Dept. of State	\$1,956,808
NASA	\$1,505,927
U.S. Dept. of Justice	\$1,076,463
Foreign	\$954,477
U.S. Dept. of Agriculture	\$800,000
EPA	\$640,169
U.S. Dept. of Commerce	\$428,520
Federal Other	\$351,903
Jefferson Lab	\$78,865
U.S. Dept. of Transportation	\$75,000
U.S. Dept. of Veterans Affairs	\$14,300
National Endowment for Humanities	\$6,000
Disease Control and Prevention	\$2,940
<b>Grand Total</b>	<b>\$100,784,063</b>



## Panther Territories

South Florida Congressional Districts  
with Most FIU Alumni



District 18  
Rep. Patrick Murphy  
Students in District: 265  
Alumni in District: 1,875



District 20  
Rep. Alcee L. Hastings  
Students in District: 921  
Alumni in District: 2,916



District 21  
Rep. Ted Deutch  
Students in District: 775  
Alumni in District: 3,661



District 22  
Rep. Lois Frankel  
Students in District: 776  
Alumni in District: 4,383



District 23  
Rep. Debbie Wasserman Shultz  
Students in District: 5,168  
Alumni in District: 17,549



District 24  
Rep. Frederica Wilson  
Students in District: 5,987  
Alumni in District: 14,607



District 25  
Rep. Mario Diaz-Balart  
Students in District: 8,091  
Alumni in District: 17,234



District 26  
Rep. Joe Garcia  
Students in District: 11,780  
Alumni in District: 31,221



District 27  
Rep. Ileana Ros-Lehtinen  
Students in District: 8,375  
Alumni in District: 24,655

## Rankings & Recognitions

FIU is #1 in the United States for awarding bachelor's and master's degrees to Hispanics.

FIU College of Law graduates were #1 in the state in their passage rate on the 2011 Florida Bar Exam.

The College of Business Administration's international business program ranked 16 in 2012 in *U.S. News & World Report's* "America's Best Colleges".

Robert Stempel College of Public Health and Social Work Associate Professor **Mary Jo Trepka** received the Presidential Early Career Award for Scientists and Engineers.

Engineering Professor **Arindam Chowdhury** is the recipient of a prestigious Faculty Early Career Development Award from the National Science Foundation.

Herbert Wertheim College of Medicine Assistant Dean **Pedro "Joe" Greer Jr.**, was awarded the Presidential Medal of Freedom.

Creative writing Professor **John Dufresne** has been named a 2012 Guggenheim Fellow, which recognizes exceptional capacity for productive scholarship or exceptional creative ability in the arts.

Alumnus **Richard Blanco** '87, '91 was selected by President Obama to compose and recite the occasional poem "One Today" at the 2013 Presidential Inauguration.

Architecture Professor **David Rifkind** received the Ackerman Prize, one of the most prestigious international awards for scholarly work in architectural history.

Herbert Wertheim College of Medicine Professor **Madhavan Nair** received a prestigious MERIT Award from the National Institutes of Health recognizing outstanding competence and productivity in research.

**50,000** Fall 2012 enrollment

**100,000** Students will graduate from FIU in the next decade

**167,000** Alumni

**180** Bachelor's, master's and doctoral programs

**96** Percent of faculty hold doctoral degrees or highest degree attainable in their field

**12** Colleges and schools including Medicine, Law and Architecture

**18** Division 1A sports teams, including football



*Be WorldsAhead*

**For more information:**

Steve Sauls, *Vice President, Governmental Relations*

Carlos A. Becerra, *Director of Federal Relations*

**305-348-3505 federal@fiu.edu**

 FIUdc FIUgov

**government.fiu.edu**