State University System
Education and General
2022-2023 Legislative Budget Request
Form I

University(s):	**Florida International University**
Request Title:	**FIU Program of Distinction on Environmental Resilience**
Date Request Approved by University Board of Trustees:	**Expected September 2021**
Recurring Funds Requested:	**$15,150,000**
Non-Recurring Funds Requested:	
Total Funds Requested:	**$15,150,000**
Please check the request type below:	
Shared Services/System-Wide Request	☐
Unique Request	☒

I. Purpose – *1. Describe the overall purpose of the plan, specific goal(s) and metrics, specific activities that will help achieve the goal(s), and how these goals and initiatives align with strategic priorities and the 2021 University Accountability Plan established by your institution (include whether this is a new or expanded service/program). If expanded, what has been accomplished with the current service/program?* 2. *Describe any projected impact on academic programs, student enrollments, and student services. University of Distinction proposals should also address the requirements outlined in the separate guidance document.*

A. Introduction

The FIU Program of Distinction on Environmental Resilience is aimed at supporting the Board of Governors Strategic Plan and FIU's 2025 Strategic Plan of achieving exceptional student-centered learning and graduate success, producing meaningful research and creative activities, and leading transformative innovation. In addition, this proposal directly addresses recommendations from both the Florida Council of 100's Project Sunrise report and the Chamber of Commerce 2030 report. Specifically, this proposal will create a "Strong Florida" through the creation of policies and projects that improve the health of Florida's cities and communities, and through a future workforce able to communicate across disciplines and implement convergent research approaches. This budget request addresses two pillars of FIU's strategic framework: 1) Accelerate Preeminence & Research and Innovation Impact, and 2) Amplify Learner Success & Institutional Affinity. The Environmental Resilience program concentrates collaboration across several of FIU's Preeminent research centers that have gained distinction through State and Federal investments in the recruitment of nationally recognized faculty. These

centers and programs, which have secured over $400M in research awards over the last 10 years, include the Institute of Environment, the Extreme Events Institute, the Institute for Resilient and Sustainable Coastal Infrastructure (InteRaCt), the Brain, Behavior and the Environment Program, and the Center for Children and Families (CCF).

FIU's leadership in environmental research and public health grew out of FIU's distinctive geographic location, diverse population and vulnerable South Florida ecosystem. From FIU's inception, faculty have focused on environmental research because of the Everglades, the Florida Keys, the coastal regions such as Florida and Biscayne Bays, and our hurricane vulnerabilities. Similarly, the size, heterogeneity and complexity of South Florida's population have attracted world class faculty to FIU to study the region's unique public health challenges.

The FIU Program of Distinction on Environmental Resilience is designed to advance our current research programs and lead to innovative solutions for enhancing local, regional, and national resilience to environmental change, including preparing the workforce needed to address these challenges. It will also raise FIU's academic standing by leveraging existing programs of national preeminence to generate new knowledge and innovative solutions for the betterment of the environment, health, and society. This will solidify FIU's role as a top urban public research university and leader in environmental resilience and solutions. If funded, this proposal for the Program of Distinction will enable FIU to further attract and retain the best, most productive faculty, cultivate future leaders, and nurture all students, post-doctoral scholars, researchers, and staff to excel.

The metrics measuring program success will be as follows:

- At least one metric must demonstrate a year-one accomplishment or success.
    - Buoy Design and Construction for water monitoring by the end of the first year and deployment on the second year.
    - Initial mapping of coastal water monitoring needs.
    - Development of storm-related prevention workshops during the first six months of the year.
    - Within the first year of funding, the Environmental Resilience program will submit at least one student training grant application to the NIH or NSF to financially support students being trained in the program.
    - Within the first year of funding, the Environmental Resilience program will submit a NIH Core Center of Excellence (P30) grant application to National Institute of Environmental Health Sciences (NIEHS) focusing on addressing the impact of environmental factors on brain health.

- At least two metrics must demonstrate a return on investment to the state.
    - During second year, sessions of the Miami International Conference on Evidence-based Treatments for Childhood and Adolescent Mental Health (MICAMH) dedicated to storm-related prevention workshops for mental health professionals and parents.
    - Enhanced water quality monitoring statewide, securing Florida's coastlines which are crucial for its economic activity from tourism and sustaining its natural marine resources.

    - Development of the Environmental Finance program to provide sustainable environmental policies and practices for government and ensure the proper operation of free markets and property rights.
    - FIU will develop a series of professional development workshops and technical reports that will be provided to stakeholders, policy makers, business, and government entities to explore new ways to link finance with environmental resilience.
    - Continued improvement in the U.S. News and World Report "Best States" category as tracked by the Florida Council of 100.

- Metrics that demonstrate how the program has improved over time as a result of the funding.
    - FIU's Program of Distinction has been a leader in Florida's Everglades restoration efforts with its "FIU in the Everglades," leading numerous discussions, workshops, and research studies.
    - Centers within the Program of Distinction continue to be successful in proposing and securing external research funding for their projects.
- Metrics and/or rankings to demonstrate program elevation to excellence and prominence.
    - Over the first five years, based on research expenditure growth, of the academic fields associated with the Program of Distinction, the rankings will improve in the NSF HERD's STEM field categories as follows:
    - Psychology – From current #9 of 438 programs among public universities to top 5.
    - Computer Science – From current #54 of 430 programs among public universities to top 40.
    - Environmental Sciences – From current #65 of 431 programs among public universities to top 50.
    - Health Sciences – From current #90 of 448 programs among public universities to top 75.

B. Creating Unique, Interdisciplinary Approaches to Florida's Environmental Resilience

This Program of Distinction addresses important environmental challenges: (1) Enhanced Water Quality Monitoring for Coastal Health and Resilience, (2) Environmental Forensics and Public Health, (3) Environmental Finance and Risk Management, (4) Family Preparation and Resilience to Disasters.

1. Enhanced Water Quality Monitoring for Coastal Health and Resilience

Tourism is an important component of Florida's economy, much of which is focused on Florida's more than 600 miles of coastline. These world-renowned economic assets are vulnerable to a myriad of environmental and human-driven challenges, e.g., harmful algal blooms (HAB), which create health risks and had significant negative impacts of up to $130 million on tourism as reported by the Tampa Bay Regional Planning Council in

2018. Most recently, we have observed first-hand our near-shore Bay assets, such as Biscayne Bay, as they continue to deteriorate due to infrastructure failures as well as declining water quality.

It is imperative that we establish state-of-the-art water quality monitoring throughout our southern coastlines as well as in the interior freshwater bodies that transport pollutants to the coastline. Through FIU's Center of Excellence in Aquatic Chemistry and Environment (described below), we are developing those necessary tools to provide the real-time data needed to make predictions regarding harmful algal blooms, fish kill events, and water quality deterioration.

In this initiative, we propose to acquire and employ a real-time, distributed sensing platform to measure and predict the occurrence of water quality and infrastructure issues and their likely severity and impacts on coastal ecosystems. In order to improve ecological models that predict the presence and locations of harmful coastal inputs, FIU seeks to understand the factors driving coastal water quality collapse.

To model the timing and spatial distribution of contaminants and pollutant inputs and water quality issues, FIU must be able to simultaneously measure climate (air temperature, light, windspeed and direction), aquatic environmental drivers (temperature, light, turbidity, dissolved oxygen, nitrogen, phosphorus, pH, pCO2, conductivity), biotic responses (algal cell densities and sizes, florescence, chlorophyll), and current/flow profiles (3-dimensional current velocity and direction, wave direction). This requires the design, development, and deployment of a sophisticated water quality buoy platform that simultaneously measures the biological and physical variables associated with poor water quality and the development of HABs, as well as other water quality-induced phenomena such as fish kill events. We will also develop sensing techniques specific for brevotoxins, which are known to be harmful to humans.

To fully utilize the data, FIU will develop and maintain a near-real-time database for both Biscayne and Florida Bays, and the Florida Keys built on our 20-year record of data collected along a series of monitoring stations. In addition to a spatially explicit database, computer scientists in our CREST Center (described below) are developing computer algorithms to search other existing city, county, and state datasets such as those at Florida Department of Environmental Protection (FDEP), South Florida Water Management District (SFWMD), Miami Dade County, etc., to harvest existing data and more fully populate the FIU database with ancillary information.

It is important to note that while it is imperative to be able to predict where and when nuisance algal blooms will occur to prevent human health issues, it is equally important to be able to predict where coastlines are free of such events and readily usable to the public and tourists.

2. Environmental Forensics and Public Health

Environmental Forensics requires a cross disciplinary approach that encompasses the understanding of the sources of environmental contaminants, their transport through key ecosystems and their subsequent incorporation into humans and other fauna. The role of elements such as magnesium, calcium, zinc, or manganese in high concentrations are

now known to be involved in the onset and progression of chronic diseases like Alzheimer's or Parkinson's.

This initiative will: (a) improve basic scientific understanding of global change and anthropogenic effects caused by multiple environmental drivers, the physical and biological responses measured in water quality, soil, and sediment contamination, emerging diseases, invasive species, and other global stressors that are a risk to ecosystems and community health—filling the knowledge gap; (b) train students in the practices and uses of technologies needed to better understand risk assessment and mitigation with innovative solutions; and (c) provide state of the art facilities that can support faculty and student researchers at FIU and around the nation—to fill research gaps that now exist because the capabilities and instrumentation are not available.

The team composition reflects the complex nature of the problem; toxic metals, for example, are affecting ecosystems like the Florida Everglades and its resources, inducing adverse outcomes pathways in marine organisms, influencing mental health of populations, and creating environmental inequalities in minority populations. Another area of concentration is the characterization of environmental materials for provenance discrimination and/or geographic origin identification.

3. Environmental Finance and Risk Management

FIU established an Environmental Finance and Risk Management Program ("Environmental Finance") to provide useful data and sustainable environmental policies for government and the private sector. The goal of the program is to apply the most sophisticated financial modeling to the latest environmental data in real time, so that the market has an accurate picture of the environmental risks.

A main focus of the program is to help ensure the proper operation of efficient markets within a sound public policy framework. For example, the programs help make sure that flood and hurricane insurance are priced correctly, and that investments in mitigation and adaptation measures are accurately reflected in the price. By linking theories and modeling techniques of finance and environmental sciences via mathematics and data science, and then studying the practical applications of this to environment-linked securities, the Environmental Finance program will offer a first-of-its-kind academic model for assessing, managing, and reducing the most serious environmental risks facing Florida and the world.

About the Program

FIU's Environmental Finance program provides solutions to environmental challenges that require research from many different fields to address. This program includes researchers and faculty from engineering, finance, mathematics, data analytics, risk management, resilience, sustainability, environmental law and policy, and coupled systems. It will also emphasize environmental finance's relevance to a growing number of commercial and policy applications. This integrated, interdisciplinary program will prepare a generation of leaders with expertise in those disciplines to meet the gravest environmental challenges, and either find or create high paying careers.

The program uses a unique "convergent" research approach that combines financial engineering and environmental science. This integration of finance and environmental science can be achieved by applying advanced financial models to environmental data in real time, so that governments and markets can correctly "price" the full array of environmental risks. Without this quantitative approach, many of our most crucial resiliency strategies are a matter of speculation with the potential for enormous social losses, whether risks are underestimated or overestimated, inflicting losses on taxpayers one way or the other.

The Environmental Finance program is built like a pyramid, with research at the base, followed by education, stakeholder outreach, and solutions at the apex.

- **Research.** With a focus on environmental parameters as triggers for financial flows, EFRM's basic research will help governments and markets to assess and price environmental risks in real time on the basis of the latest data. These applications can help strengthen and advance virtually every area of sustainable finance, from disaster preparedness and resilience to climate change mitigation and environmental sustainability, through advanced financial instruments such as catastrophe bonds, weather derivatives, index insurance, carbon emissions trading systems, debt-for-nature swaps, mitigation banking, green bonds, and ESG investments
- **Education.** The program will offer an undergraduate major, and graduate and professional certificates (a series of for-credit courses taken together to achieve a level of understanding and proficiency). Full master's and Ph.D. programs are being developed. The certificate programs will be taught in-person and fully online for working professionals. The certificates will also be made available to non-degree-seeking students from around the state, country, and internationally.
- **Outreach.** EFRM also has a robust program of community, state, and national outreach. Program researchers are working with government entities to increase awareness of regional resiliency efforts and are working with stakeholders to develop reports and recommendations for a coordinated regional strategy for addressing critical environmental challenges.
- **Solutions.** Building on those foundations, our program will craft innovative solutions to critical environmental problems that governments and the private sector need in order to prepare for future challenges.

4. Family Preparation and Resilience to Disasters

Given increasing risk from severe weather and other shock events in Florida, preparing the state's most vulnerable populations is critical, in both pre- and post-impact periods. FIU's Center for Children and Families (CCF) and Extreme Events Institute (EEI)/International Hurricane Research Center (IHRC) are well positioned to address this critical challenge. The CCF-EEI/IHRC teams will coordinate to develop workshops focused on promoting storm- and shock-related media literacy for Floridians by helping families (a) make sense of meteorology reports, storm updates, and shock event coverage, (b) learn to distinguish actionable updates from more "spectacle-focused" coverage, and (c) appreciate the negative impacts that extensive media exposure can have on child and family functioning. Parents will receive coaching on how to talk to children across

different developmental levels about impending storms and shock events and about destruction and loss, and will be trained on how to identify signs of significant impact and adjustment difficulties in their children and themselves.

In the context of shock or severe weather events, addressing emotions and preparation is not only critical from a public mental health perspective, but also from a public safety perspective. Research documents how stress and irrational public behavior constrain responsible decision-making and place Floridians at risk. During storm watches for example, masses of individuals not dwelling in evacuation zones make emotion-based decisions that contribute to pervasive traffic congestion/gridlock and widespread gas shortages that disrupt and prevent timely evacuation for those in mandatory evacuation zones and in immediate danger. Poor pre-season household preparation (e.g., stocking water, non-perishables, batteries, and other supplies) leads to abrupt supermarket shortages during individual storm watches that lead to additional unwarranted evacuations that burden the smooth and timely flow of evacuees from high-risk/mandatory evacuation regions. In fact, one of the leading reasons individuals in high-risk zones give for not choosing to evacuate is their concern that evacuation routes (and subsequent return routes) will be overcrowded and that they will not be able to access needed fuel along the way.

Once the shock- and storm-related prevention workshops are developed, the CCF is well-poised to disseminate them to the rest of the State of Florida through multiple mechanisms. The CCF's annual Miami International Conference on Evidence-based Treatments for Childhood and Adolescent Mental Health (MICAMH) can be used as a dissemination site as it is attended by mental health professionals from around the state. Further, the CCF has extensive experience disseminating information to health professionals throughout Florida and the U.S. through its decade-old website on Evidence-based Practices in Child Mental Health. Further, Dr. Jonathan Comer, a member of the CCF with expertise on the impact of disasters on child mental health, has developed procedures for modifying parenting programs to be delivered over the internet, and has shown that the impact is comparable to face-to-face trainings/sessions. Thus, the team will develop both face-to-face and web versions of shock- and storm-related prevention materials. The dissemination effort will also be facilitated through the extensive networks of FIU's Extreme Events Institute (EEI) and International Hurricane Research Center.

C. Workforce of the Future

The future workforce will need to be able to communicate across disciplines, implement convergent research approaches, and navigate the technological innovations of coming decades. Attracting and retaining top research faculty will provide our undergraduate and graduate students with exceptional preparation for innovatively solving the most critical environmental resilience challenges. In addition to traditional in-class and lab training, this proposal includes extensive field opportunities and innovative workforce training components. The U.S. Bureau of Labor Statistics, Employment Projections program highlights that future jobs will require degrees, credentials, and skills offered by trans-disciplinary programs, such as Environmental Risk Management, Engineering, Public Health, and Disaster Management.

Alongside the research programs mentioned above, we will develop the workforce needed to enhance environmental resilience locally and nationally. A few specific programs to be added to our current offerings include:

Certificate in Environmental Finance and Risk Management.
As mentioned above, very few students or faculty have training in both finance and environmental science. This initiative will link our pre-eminent Institute of Environment with our nationally ranked programs in mathematics, statistics, finance, policy, law, business, and engineering to establish a graduate/professional certificate program in Environmental Finance, not only for our students but for professionals from around the country and the world who are working to solve the challenges of Environmental Resiliency. The overarching goal of the Certificate Program is to spur an understanding of how the modern global financial system interacts with multiple natural systems. Specific goals are to train future scientific, financial, and policy professionals in:

- The advanced quantitative skills required to understand, evaluate, and price modern financial instruments that are linked to environmental parameters. Such skills include scientifically based risk assessment, analytic techniques of mathematical finance, and computer-based simulation techniques.
- Key statistical methods and techniques for applying these methods to scientific and financial data.
- Key concepts of the role of finance as part of the dynamic coupled Earth Systems.

Environmental Fellows pipeline and top student recruitment.
The Environmental Fellows pipeline will be focused on the development and recruitment of top-qualified and diverse talent from South Florida schools. This will include high school teacher trainings, intense summer research experiences, guaranteed undergraduate research placements and paid internships in the fields related to Environmental Resilience.

Graduate student retention, doctoral student and postdoctoral fellow support. Graduate students and postdoctoral fellows constitute a fundamental scientific workforce for research centers and research programs. FIU will provide financial support for recruitment and retention of graduate students and postdoctoral fellows who will work with the faculty directly involved with these programs.

Industry partnerships, trainings and certifications.
This funding will support partnerships with industry in developing technological solutions to address environmental challenges and partnerships in workforce training. Artificial intelligence, robotics and financial management in industry competency for environmental resilience associated with the proposed Environmental Resilience program of distinction.

Artificial Intelligence & Robotics.
Automation and machine intelligence promise to fuel economic growth and produce new occupations, with likely impact on almost all industries and occupations. The broad-based application of Artificial Intelligence (AI) to software and hardware systems is launching a significant leap forward, creating intelligent software applications and

robotic machines that learn from experience to make decisions and process vast amounts of data to reach independent conclusions. Therefore, we propose training in automation and robotic processes, in partnership with our Robotics Academy.

To further disseminate the findings, FIU will develop a series of professional development workshops that can be provided to stakeholders, policy makers, business, and government entities to explore new ways to link finance with environmental resilience.

D. Research Centers and Programs Participating in the Environmental Resilience Core Competence Program

The Institute of the Environment

The Institute of the Environment has over 130 faculty and staff and includes the Southeast Environmental Research Center (SERC), the Center for Coastal Oceans Research and the Medina Aquarius Program, the Florida Coastal Everglades Long Term Ecological Research Program, plus an NSF-funded Center of Excellence on aquatic chemistry and ecotoxicology. It also includes the Sea Level Solutions Center, bringing together faculty from nearly every college and school at FIU to address challenges posed by rising seas and other environmental threats. In addition, the Institute features organized research units on the Sustainable Built Environment and Informatics, International Programs, and a UNESCO Chair on Water Security and Social Equity. From the wetlands of the Everglades to the coral reefs in the oceans, institute researchers are helping to preserve freshwater and marine resources for future generations. The Institute of Environment is the largest research center/institute at FIU, with a portfolio of over $40M in research awards, which includes both research grants and training grants for undergraduate and graduate students.

The Director of the Institute, Dr. Todd Crowl, has more than 30 years of experience working on interdisciplinary projects related to ecosystems science and aquatic ecology, including urban stream ecology. Dr. Crowl has received and managed more than $40M of grants, including two of the NSF's largest Center of Excellence awards.

The Institute of Water and the Environment houses several flagship programs that have State of Florida, national and international recognition. These flagship programs include:

- The Center for Aquatic Chemistry and the Environment (CAChE): A National Science Foundation (NSF) Center of Research Excellence in Science and Technology (CREST) that tackles one of the most complex challenges—environmental contamination. CREST has funded over 30 PhD students and over 50 undergraduate and master's students.
- The Florida Coastal Everglades (FCE) LTER Program: Part of the Long-Term Ecological Research (LTER) Network established by the National Science Foundation in 1980. The FCE LTER Program was established in May of 2000 in South Florida, where a rapidly growing population of over 6 million people live near - and in dependence upon - the Florida Everglades. The program includes 86 senior scientists and 77 students from 29 institutions. FCE researchers study how hydrology, climate, and human activities affect ecosystem and population dynamics in the ecotone

and more broadly, the Florida Coastal Everglades. FIU researchers working in the Everglades provided the data and water quality analyses that were used to set Florida's water quality criteria. The criteria for allowable phosphorus concentrations in freshwater are still in force and have significantly diminished the threat of catastrophic algae bloom in the Everglades.

- The Southeast Environmental Research Center (SERC) Water Quality Monitoring Network. Operated by SERC, the function of the Network is to address regional water quality concerns that exist outside the boundaries of individual political entities. Funding for the Network has come from many different sources with individual programs being added as funding became available. Field sampling occurs over different time periods due to the nature of the funding. The Florida Keys National Marine Sanctuary and the Southwest Florida Shelf are sampled quarterly. The data summary maps are produced on a quarterly basis by integrating the individual projects into one data file for that month sampled. Previous surveys of Biscayne Bay, Florida Bay & Whitewater Bay, Ten Thousand Islands, and Marco-Pine Island Sound were sampled monthly.
- The Center for Coastal Oceans Research. The Center consists of the Medina Aquarius Program, the world's only permanent undersea research laboratory, and partners with the Florida Keys National Marine Sanctuary, and the Rookery Bay Research Reserve.

The Extreme Events Institute (EEI)

The EEI comprises the International Hurricane Research Center and the Disaster Resilience and Climate in the Americas program. The EEI is a globally involved center for research, education, and training in natural hazards and disaster risk management. The Institute conducts multi-disciplinary research on hazards and vulnerabilities of all types, with emphasis on the role of pre-impact risk drivers. The Institute includes faculty and researchers from the social and behavioral sciences, engineering, computer science, earth and atmospheric sciences, public health, public administration, business, and architecture. The EEI manages the Wall of Wind Laboratory, which was established through a State of Florida Center of Excellence and is funded through the NSF Natural Hazards Engineering Research Infrastructure (NHERI) program. The EEI developed and manages the Florida Public Hurricane Loss Model. The EEI has a portfolio of $15.6M in research awards from of a variety of agencies, including the NSF, NOAA and USAID.

The Director of EEI is Dr. Richard Olson, an international expert on disaster management. Professor Olson was part of a research team to the 1972 Managua, Nicaragua earthquake and was subsequently involved in disaster response, research, and evaluation of more than 20 events, including Guatemala 1976 (earthquake); Chile 1985 (earthquake); Mexico City 1985 (earthquakes); Colombia 1985 (volcanic eruption and lahar) and 1994 (earthquake and landslide); Peru and Bolivia 1996-1998 (El Niño-Southern Oscillation); the Dominican Republic 1998 (Hurricane Georges); Honduras and Nicaragua 1998 (Hurricane Mitch); Belize 2000 (Hurricane Keith); and El Salvador 1986 and 2001 (earthquakes). He subsequently organized field research teams to the Chile and Haiti earthquakes of 2010.

The Institute for Resilient and Sustainable Coastal Infrastructure (InteRaCt)
InteRaCT identifies engineering solutions for challenges faced by aging infrastructure and develops innovative and economical technologies for the creation of resilient and sustainable communities. The economic prosperity of the United States is closely related to the health of the nation's infrastructure, which includes aviation, bridges, dams, drinking water, waterways, ports, rail, transportation, roadways, bridges, communication, energy, wastewater systems, water management systems, and power systems, to name a few. InteRaCt is an umbrella organization that incorporates bridge engineering, the U.S. Department of Transportation-funded University Transportation Center (ABC-UTC), and the Lehman Center for Transportation Research.

InteRaCT has a portfolio of research awards of $5.1M. The Director of the Institute, Dr. Atorod Azizinamini was recruited as a cluster hire to be the chair of Civil and Environmental Engineering in 2011.

The Brain, Behavior and the Environment Program
The Brain, Behavior and the Environment Program is a trans-disciplinary initiative at FIU that unites the dynamic and diverse neuroscience community at FIU toward three goals: to create and empower research programs focused on environmental causes of neurological disease, to devise strategies and develop treatments for neurological disorders using novel neuroscience and engineering tools as well as pharmacological approaches, and to establish a rich educational resource in South Florida to educate students, faculty, clinicians, the public, and health officials on the role that environmental factors play in neurological disease. This program currently has $10M in research awards, with the majority being from the NIH.

The Brain, Behavior and the Environment Program includes a multidisciplinary group of faculty. Dr. Tomas Guilarte is the director of the Program and Dean of the Robert Stempel College of Public Health & Social Work. Dr. Guilarte was recruited through a World Class Scholars initiative. Dean Guilarte is renowned for revealing the effects that low-level lead exposure has on the central nervous system during brain development, a discovery that led to strategies for mitigating learning deficits. He joined FIU after serving as the inaugural Leon Hess Professor and Chairman of the Department of Environmental Health Sciences at Columbia University-Mailman School of Public Health in the City of New York. Prior to Columbia University, Dr. Guilarte spent three decades as a professor and researcher in the Department of Environmental Health Sciences at the Johns Hopkins University Bloomberg School of Public Health.

The Center for Children and Families (CCF)
The CCF is a nationally recognized, interdisciplinary clinical research center committed to improving the lives of children and families struggling with mental health concerns. The mission of the CCF is to (1) study the causes and nature of children's mental health problems, (2) to develop and test intervention and prevention models for evidence-based, cost-effective services that can be used to improve mental health in children and families at a population level, (3) to provide services for children and families in clinic and community settings, and (4) to educate students, families, and professionals in the U.S. and abroad regarding the causes and treatment of childhood mental health and effective intervention and prevention. The CCF has over $60M in research awards (50 grants), with the majority being from the NIH. The CCF was recruited to FIU from SUNY

Buffalo as a part of a cluster hire, and its director, Dr. William Pelham, is internationally recognized as a leader in child mental health and has received numerous national awards recognizing his contributions. Dr. Pelham has hired 25 faculty members in the CCF, all of whom have all obtained federal funding for their research and the majority of whom have won early and midcareer awards for their research. Dr. Jon Comer has received national exposure for his research on children's response to disasters, including hurricanes. Dr. Pelham has held more than 80 research grants (16 current) from federal agencies (NIMH, NIAAA, NIDA, NINDS, NICHD, IES), foundations, and pharmaceutical companies, and has over 400 scientific publications. CCF faculty together publish more than 160 scientific papers annually. Dr. Pelham and other CCF faculty have served as consultants/advisors to numerous federal agencies (e.g., NIMH, NIAAA, NIDA, NICHD, IES, ACF, SAMHSA, IOM, OMAR, CDC, and AHRQ) and national organizations (AAP, AACAP, APA, CHADD, NICHQ, SDBP). The CCF conducts a nationally prominent annual conference, the Miami International Conference on Evidence-based Treatments for Childhood and Adolescent Mental Health (MICAMH), that is attended by more than 500 mental health professionals throughout Florida.

E. Funding Categories (excluding Personnel listed in Section III)

Faculty Research Grant Support ($600,000)

The growth of the program of distinction in terms of obtaining external research funding and quickly moving the research finding into technical applications and programmatic applications will depend on the recruitment of staff. Staff will be essential in providing the necessary administrative support, and perhaps more importantly, support in the pursuit of funding for the basic and translational research that will be conducted.

Recruitment Scholarships and Retention/Completion Grants ($1,500,000)

This funding will expand the merit scholarship budget towards the goal of improving the incoming student profile in the disciplines associated with the Environmental Resilience program of distinction, as well as retaining and accelerating the graduation rates of students. These funds also support students who face unexpected emergencies and financial circumstances that impact their ability to remain enrolled.

Industry Partnerships for Economic Growth/Workforce Development in Environmental Resilience ($1,000,000)

An important component of FIU's 2025 Next Horizon Strategic Plan is learner success through alignment with industry workforce needs. This funding will support partnerships with industry in developing technological solutions to address environmental challenges and partnerships in workforce training. Artificial Intelligence, Robotics and Financial management in industry competency for Environmental Resilience associated with the proposed Environmental Resilience program of distinction.

This will include:

- Identification and badging "essential" skills
- Identification and badging industry-recognized credentials throughout degree programs
- Alignment of essential skills to University Core Curriculum
- Development and/or alignment of continuing education for workforce development

Ongoing Support for Field Deployed Monitoring Equipment and Data Processing Technologies ($2,500,000)

The funds will be used to establish and maintain world-class coastal monitoring systems and centralized data-processing to inform policy and decision-making. This dataset will be available to all researchers focused on enhancing the resilience of Florida's coastal environment and the large populations living in near proximity. This program will require continuous upgrades and maintenance support to ensure it is well-positioned to help answer the critical questions facing Florida.

II. Return on Investment - *Describe the outcome(s) anticipated, dashboard indicator(s) to be improved, or return on investment. Be specific. For example, if this issue focuses on improving retention rates, indicate the current retention rate and the expected increase in the retention rate. Similarly, if the issue focuses on expanding access to academic programs or student services, indicate the current and expected outcomes. University of Distinction proposals should also address the requirements outlined in the separate guidance document.*

Return on Investment will be measured through metrics listed earlier that are directly related to the impact of the Environmental Resilience program on specific areas of program focus, as well as on the overall impact on FIU's progression in student success and research excellence. Through the program's accomplishments, FIU will also contribute to the SUS goal of Florida continuing to lead in higher education across the nation. Competition for economic drivers such as corporations, business infrastructure, and research and development are estimated to only increase across the state, and we believe FIU's relative contributions to these SUS goals will help to retain existing and drive new business and industry to Florida. This request focuses on Accelerating Program of Distinction Research, Student Success and Innovation Impact.

III. Personnel – *Describe personnel hiring and retention plans, making sure to connect both plans to initiative(s) and goal(s) described in section I. State the amount of faculty FTE and staff FTE and estimated funding amounts used for retention and new hires in each category. In describing faculty hires, provide overall hiring goals, including academic area(s) of expertise and anticipated hiring level (e.g., assistant professor, associate professor, full professor. Please describe how funds used for faculty or staff retention will help the institution achieve its stated goals. University of Distinction proposals should clearly note how anticipated hires or retained individuals will help the institution elevate a program or area to national or state excellence.*

Faculty Recruitment/Teaching and Research ($7,000,000)

Faculty are the main drivers of research and student success at a university. To expand the interdisciplinary research collaboration of the Environmental Resilience program of distinction, faculty recruitment will be essential. Following the successful approach that has brought FIU to the status of a Research I University, the faculty recruited into this core program of distinction will consist of clusters that will both complement and add to

the existing faculty; and will be world class in their achievements and potential. We will focus on expertise in the intersect of environmental factors and public health, and resilient infrastructures. We will recruit 3 members of the National Academies of Sciences, 21 senior level faculty and 16 mid-level faculty.

The full impact of a program of distinction encompasses both research and teaching. Our goal is for the program to be a critical contributor to student success in all the areas (environment, infrastructure and public health) that are the interdisciplinary components of the program. Therefore, we will accelerate the recruitment of new faculty, with the recruitment focusing on curricular areas with highest demand within the integrated program. These new faculty members will focus on offering undergraduate level courses in various modalities to meet student demand and supply additional class sections required to ensure timely degree completion.

Environmental Fellows Career Pipeline ($1,000,000)

The Environmental Fellows pipeline will be focused on the development and recruitment of top-qualified and diverse talent from South Florida schools. This will include high school teacher trainings, intense summer research experiences, guaranteed undergraduate research placements and paid internships in the fields related to Environmental Resilience.

Early engagement in research experiences leads to undergraduate student success, both in terms of early graduation and job placement success or continuation to post-graduate education. The Environmental programs at FIU already have recruitment and training connections with high schools and state colleges. This includes Research Assistantships for High School Students (RAHSS), as well as the Research Experience for Teachers (RET), and the Wind Engineering for Science Teachers (WEST) Workshop, which involves seasoned Miami-Dade County Public School (M-DCPS) teachers participating in a 6-week wind engineering research program. We will design an Environmental Academy pipeline by accelerating dual enrollment, providing High School students with summer research basics/fundamentals, and professional development for High School science teachers to strengthen the pipeline. This component of the program will also focus on establishing an early pipeline of State College students with interest in the fields of study associated with the program. FIU is already co-located with MDCPS's Marine Academy of Science and Technology (MAST) at its Biscayne Bay Campus.

Doctoral Student Support ($800,000)

FIU's doctoral degree production has increased by 15% (373 to 430) in the past three years, with increases in research doctorates by 28% (151 to 194). Research doctoral education is an integral part of research preeminence, and a necessary component of recruitment of world class faculty. We will dedicate some of the financial support of doctoral students that will be part of the academic programs connected to the proposed program of distinction. This will support the continued success of these programs by being able to recruit the best and brightest doctoral student candidates. Since the research programs and institutes that are part of the proposed program of distinction receive significant external research grants and drive FIU's innovation, this investment will in turn increase external funding for doctoral students and amplify FIU's innovation impact.

Program of Distinction Postdoctoral Fellows ($750,000)

Postdoctoral scholars constitute a fundamental scientific workforce for research centers and research programs. World Class faculty, when recruited, require postdoctoral support to back their research. Successful postdoctoral scholars conduct research, add to the research funding, and assist in the training of undergraduate and graduate students.

IV. Facilities (*If this issue requires an expansion or construction of a facility, please complete the following table.):*

	Facility Project Title	Fiscal Year	Amount Requested	Priority Number
1.				
2.				

2022-2023 Legislative Budget Request
Education and General
Position and Fiscal Summary
Operating Budget Form II
(to be completed for each issue)

University: **Florida International University**
Issue Title: **FIU Program of Distinction in Environmental Resilience**

	RECURRING	NON-RECURRING	TOTAL
Positions			
Faculty	51.00	0.00	51.00
Other (A&P/USPS)	10.00	0.00	10.00
Total	61.00	0.00	61.00
Salaries and Benefits	$8,808,251	$0	$8,808,251
Other Personal Services	$1,166,774	$0	$1,166,774
Expenses	$2,965,750	$0	$2,965,750
Operating Capital Outlay	$2,209,225	$0	$2,209,225
Electronic Data Processing	$0	$0	$0
Financial Aid	$0	$0	$0
Special Category (Specific)	$0	$0	$0
_____	$0	$0	$0
_____	$0	$0	$0
_____	$0	$0	$0
Total All Categories	$15,150,000	$0	$15,150,000