



It is with great enthusiasm I present the 2017-2018 Annual Report for the Patel College of Global Sustainability (PCGS). The 2017-2018 Academic Year was an important period for PCGS's effort to become a truly interdisciplinary degree-granting College of the University of South Florida. PCGS made great strides in meeting and exceeding the strategic goals set for the College. We saw remarkable increase in competitive external funding for research and in student enrollment numbers. We enhanced student success, raised admission standards, and revised and updated graduate curriculum to reflect the rapid changes taking place in the field of global sustainability education and research in the State of Florida, the United States, and elsewhere in the world.

The academic mission of PCGS is achieving sustainable development, both locally and globally, by fostering social, economic and environmental sustainability; we accomplish this through teaching, research, student mentoring and community outreach, as well as by generating practical knowledge and developing innovative technologies, skills and policies. This mission is well aligned with the strategic priorities of the University of South Florida as a pre-eminent global research university. The College is engaged in education, research, and service activities that create solutions for sustainable development in a rapidly-changing world, based upon USF's broad, interdisciplinary expertise in renewable energy, water, climate science, public health, energy, transportation, global security, and social equity, among others. This interdisciplinary approach prepares our students well for career options and professional opportunities with industries, governmental agencies (at city, county, state and federal levels), international organizations and NGOs that are seeking solutions to sustainability challenges.

Drawing upon various definitions of "sustainability" we seek to ensure that these efforts both endure and dramatically expand at USF; that they encourage the natural interconnections among those groups on campus addressing ecology, economics, politics and culture; that they recognize the essential contributions of scholars and professionals in engineering, business, architecture

related to sustainability and to encourage them to work with the College as affiliate faculty to engage in joint research and teaching. PCGS collaborates with five USF Colleges – College of Arts & Sciences, College of Engineering, College of Business, College of Marine Sciences, and the College of Public Health. In my capacity as Dean, I actively seek out input and advise on academic matters from the College Advisory Board made up of the Deans of these USF Colleges. This Advisory Board meets twice a year, most recently met in January 2018. The College went through its first seven-year academic review by an external evaluator designated by the Provost. The external evaluator from the Center for Global Sustainability at the School of Public Policy of the University of Maryland visited the College in February 2018; we are waiting for the Report from the evaluator for review and action.

The College has received approval from the Graduate Council to launch a new MA concentration in Global Sustainability Policy starting fall 2018, which is supported by the Schools of Public Affairs and Geosciences in the College of Arts & Sciences. The College is expected to add new faculty members during the 2018-2019 Academic Year.

Govindan Parayil, Ph.D.
Dean

Drawing upon various definitions of “sustainability” we seek to ensure that these efforts both endure and dramatically expand at USF; that they encourage the natural interconnections among those groups on campus addressing ecology, economics, politics and culture; that they recognize the essential contributions of scholars and professionals in engineering, business, architecture and urban planning, transportation, health, global studies and the natural and social sciences; and that they serve to create and maintain the conditions under which humans and nature can exist in productive harmony, fulfilling the social and economic requirements of present and future generations.

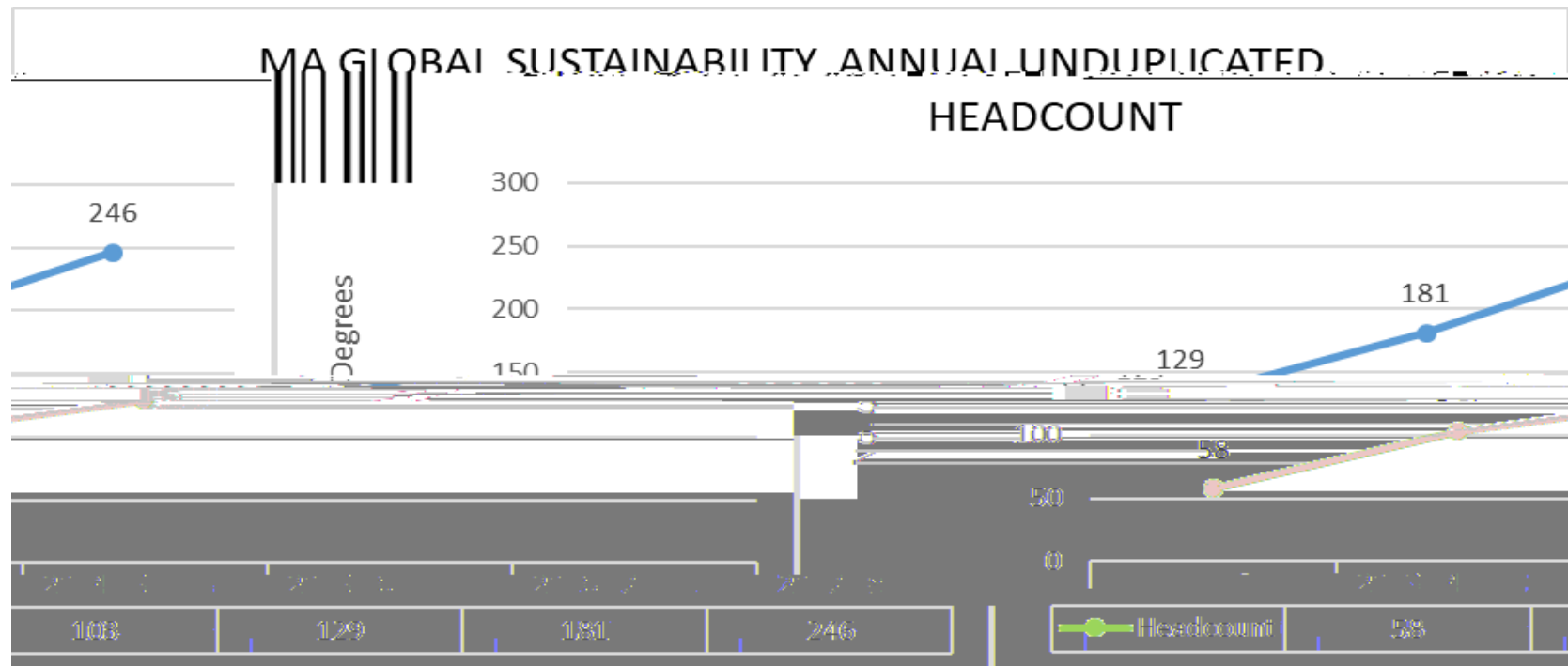


The Patel College of Global Sustainability maintains a Student Development program that offers general advising to all students and alumni, including résumé building assistance, résumé reviews, career choice advising, and networking opportunities. Students are also provided with a list of suggested certifications, relevant professional organizations, and specific companies that are hiring graduates in the field of sustainability, as well as information about the University's Career Services—all of which are accessible at all

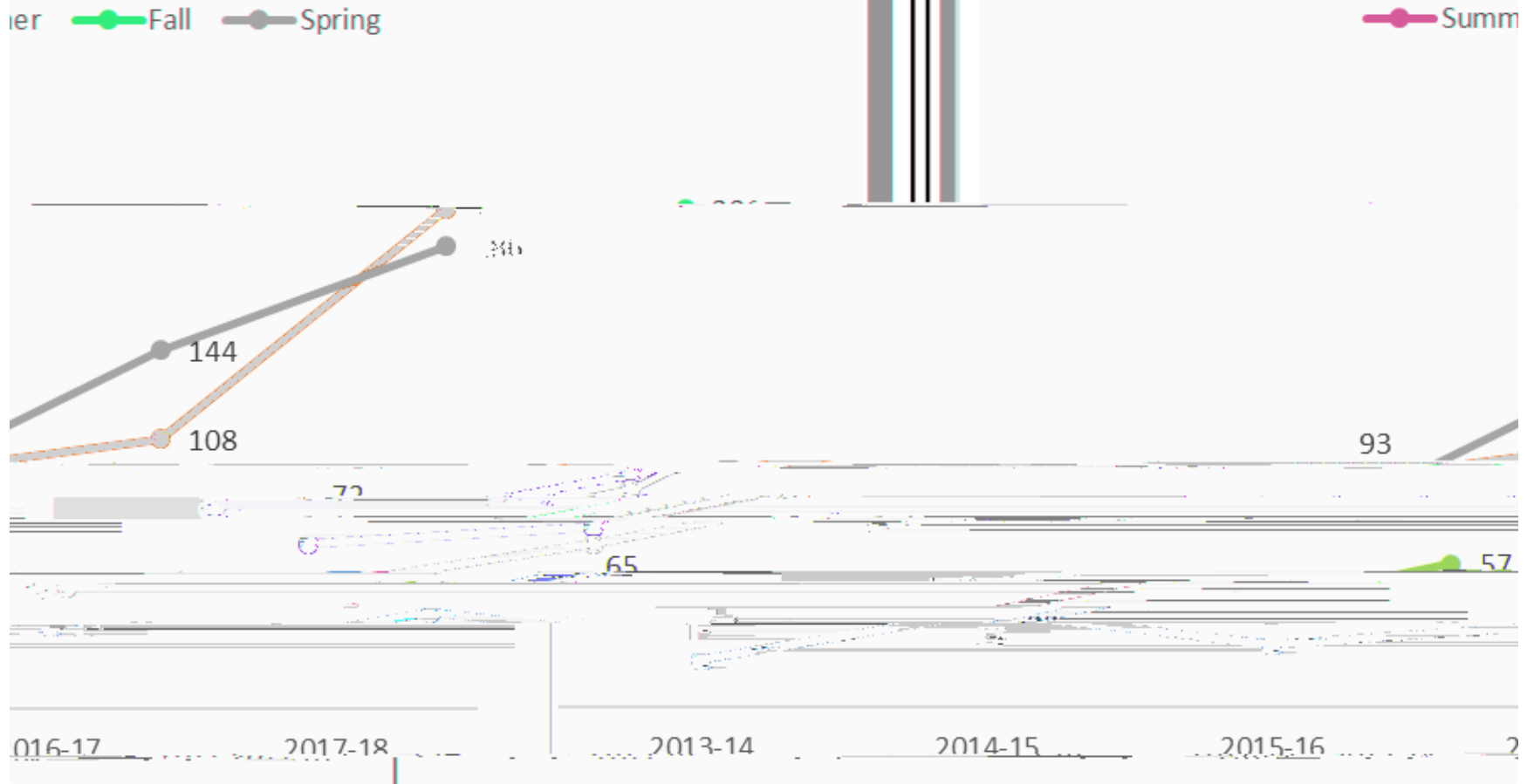
Hydrologist, Southwest Florida Water Management District
Energy Specialist, Cenergistic
Global Environmental Health and Safety Expert, Jabil
Senior Project Specialist, Stantec
Environmental Health & Safety (EHS) Manager, Formulated Solutions
Sustainability Officer, Houston Community College
Environmental Project Manager, HDR
Recycling and Sustainability Manager, Leon County
Recycling Manager, Goodwill
Sustainability Consultant, ERM
Environmental Consultant, Handex Consulting & Remediation, LLC
Energy Analyst, Arrowpoint Corporation
Regional Coordinator, National Oceanic and Atmospheric Administration (NOAA)

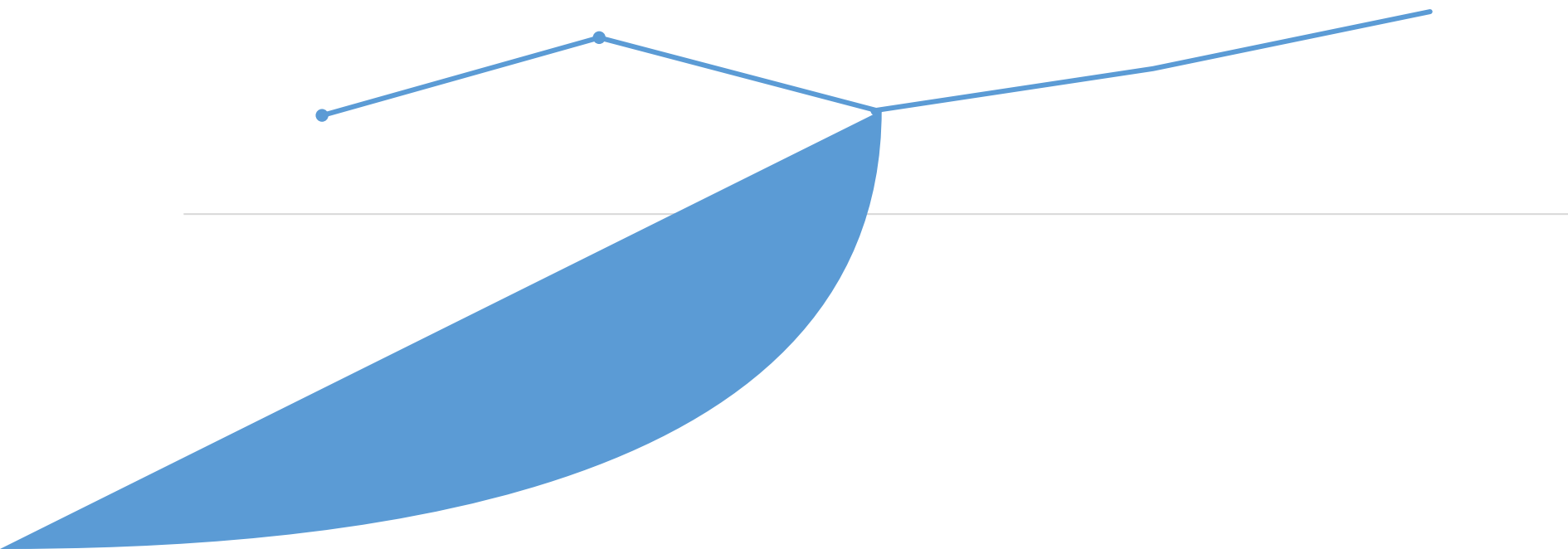
The below Figures illustrate total MA student enrollment trends over the last five academic years. There has been a significant increase in the number of enrolled MA students, especially over the last two years. The last academic year (2017-2018) recorded enrollment is the largest in the history of the College. The College plans to maintain the MA student enrollment in the range of 150-200 graduate students until we can support larger enrollment by increasing our faculty and support staff.

Projected enrollment for 2018-2019 is even higher as PCGS started offering summer courses in 2017 for the first time in our history due to increasing demand by students. This will increase SCH, reduce time to graduate, and provide additional opportunities for instructors, GAs and support staff during summer months.



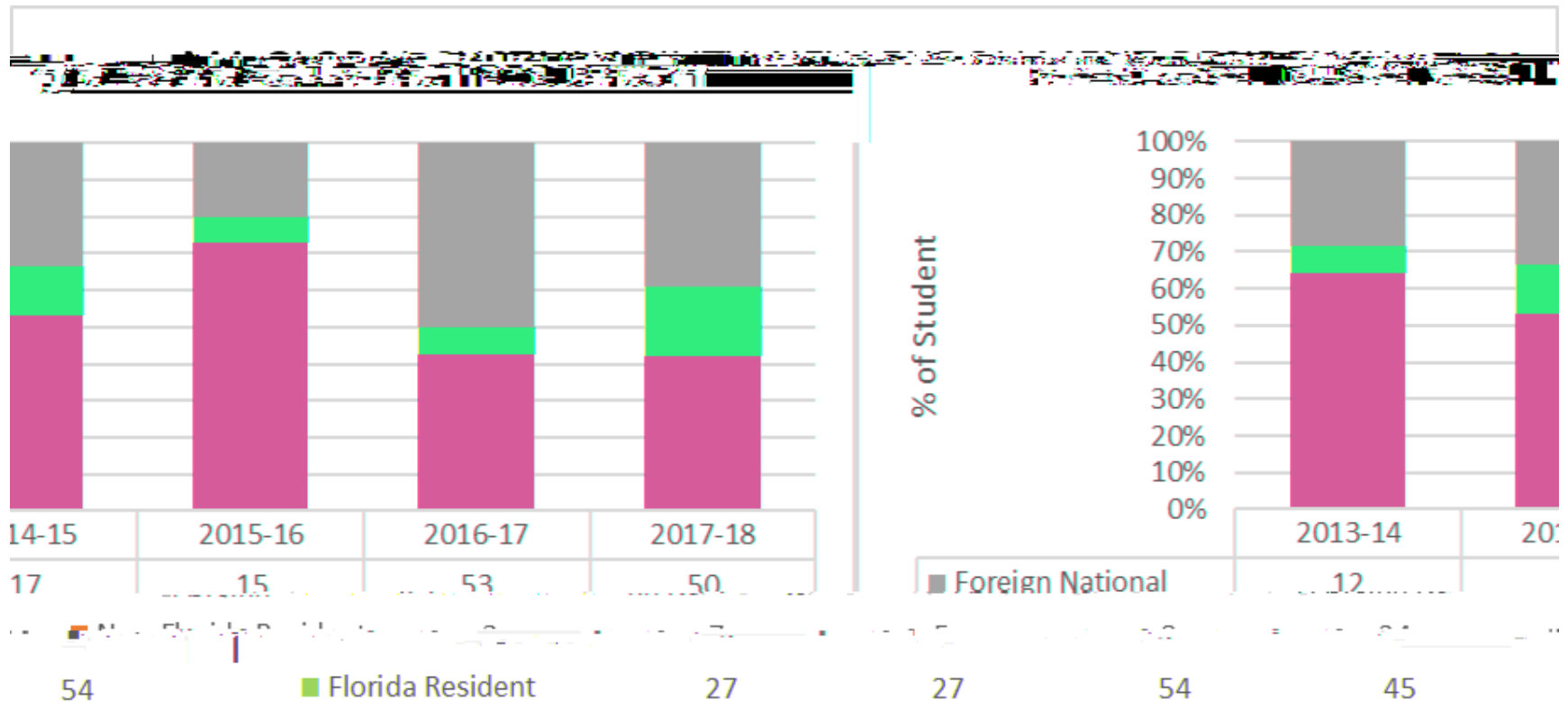
MA GLOBAL SUSTAINABILITY TOTAL ENROLLMENT



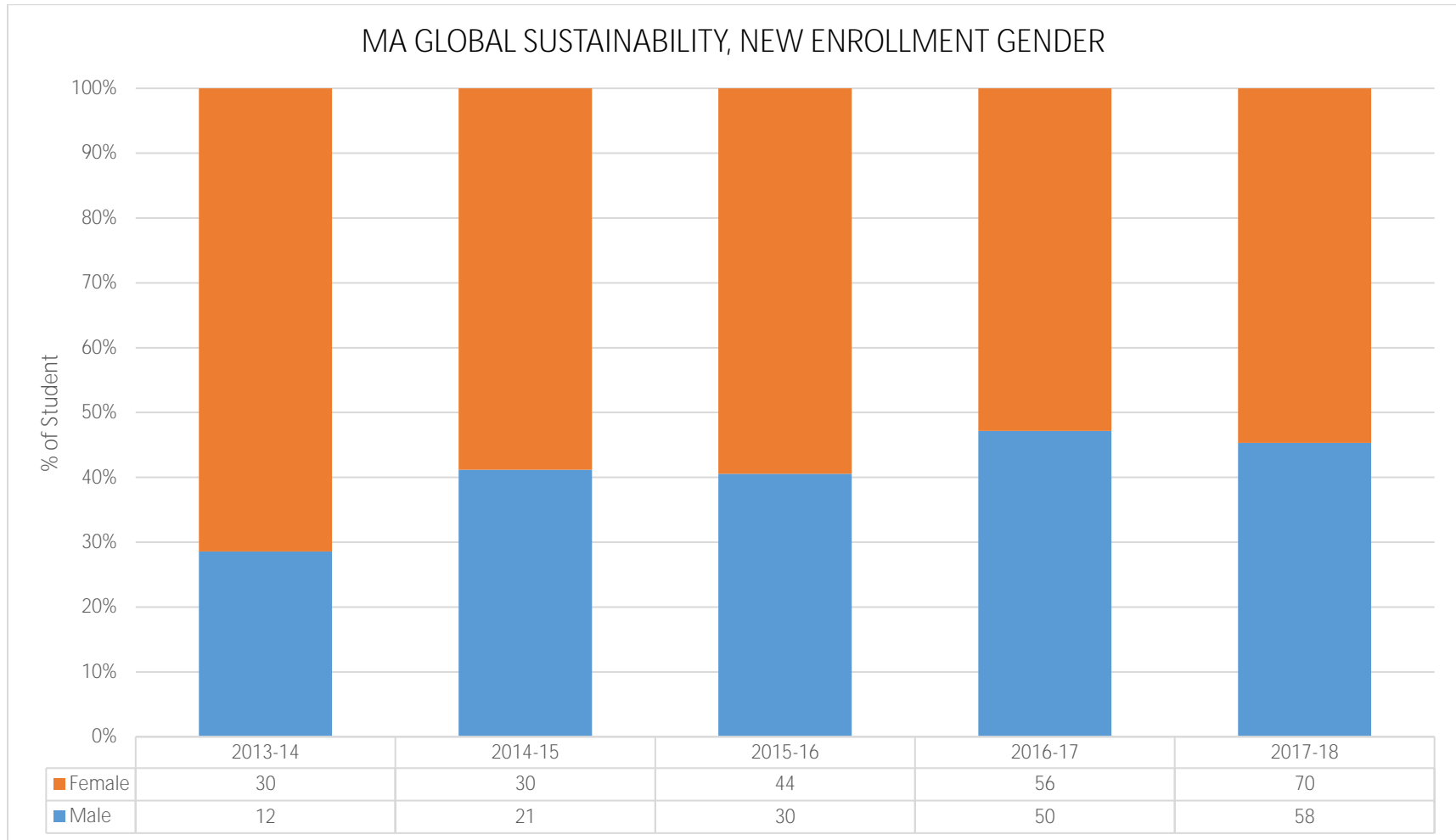


The below figure illustrates the admissions and enrollment trends over the last five years for new students. There has been steady

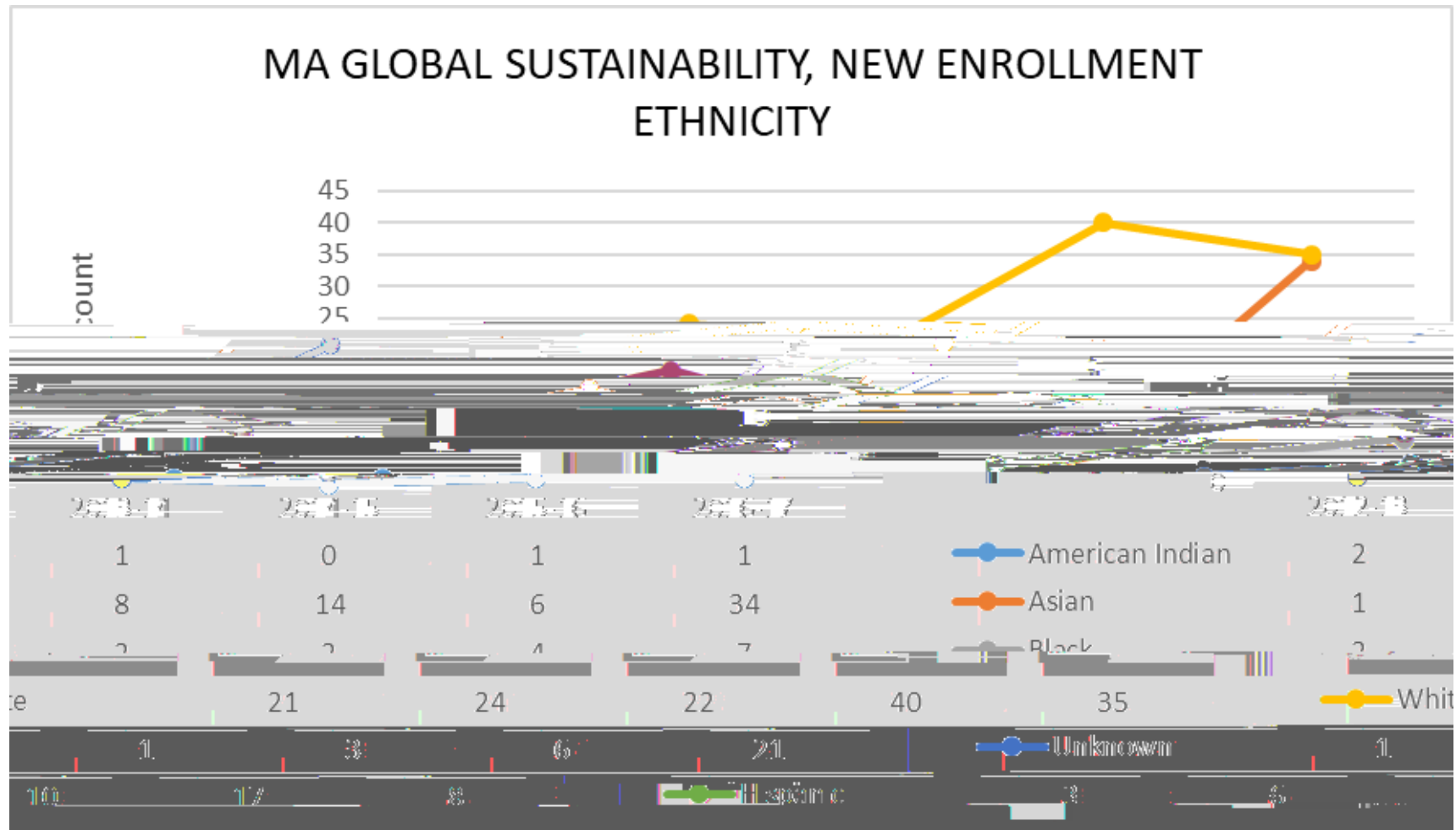
The below figure illustrates the residency and enrollment trends over the last five years for new students. The Patel College of Global Sustainability has a significant percentage of non-resident and international students enrolled. The makeup of international students in the last five reported years has been at least 20% of our student body, and as high as 50% in 2016-2017.



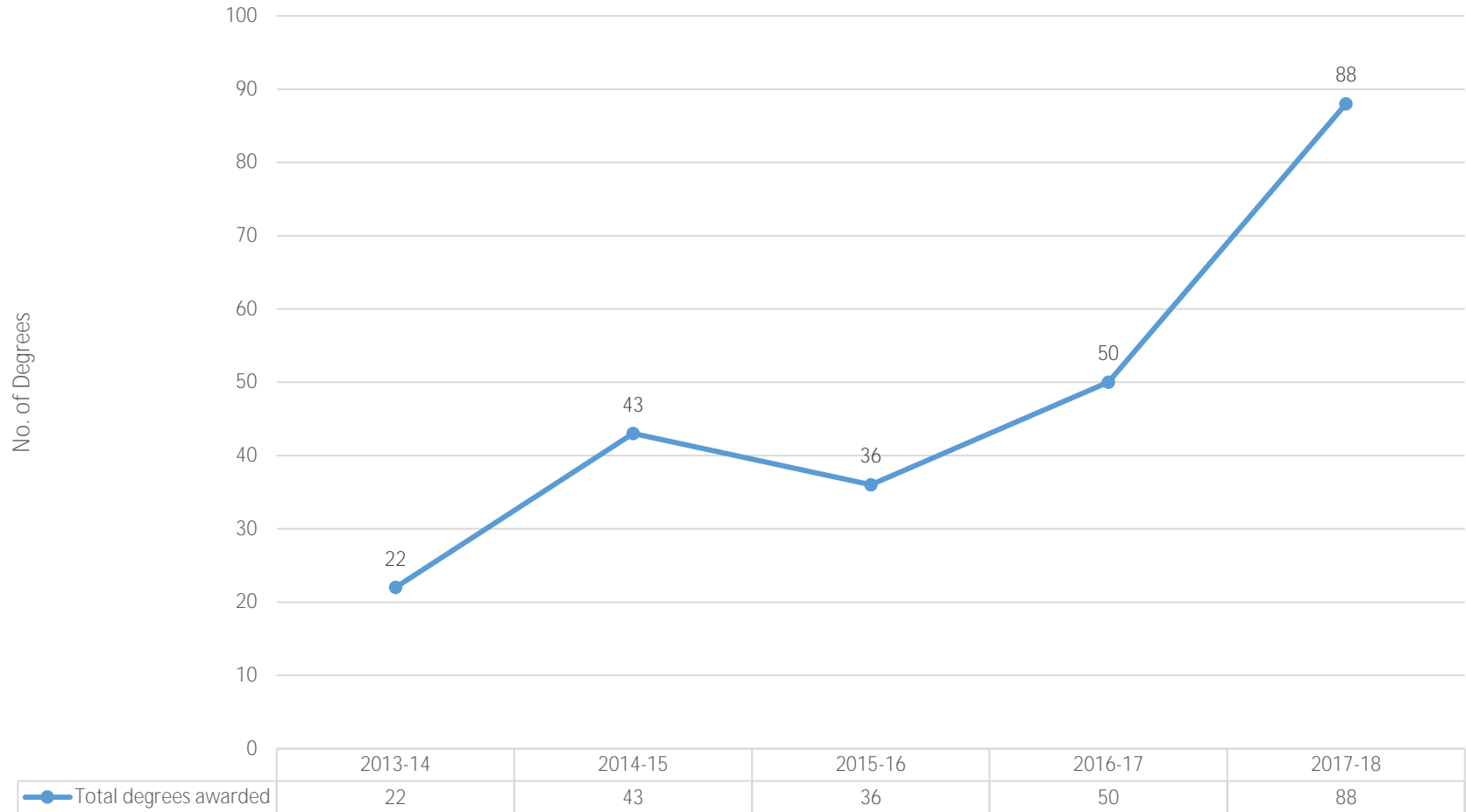
The below figure illustrates the gender distribution in enrollment trends over the last five years for new students. PCGS has a significant percentage of female students (over 50%) every year, and as high as 70% females enrolled in the program (2013).



The below figure illustrates the ethnicity distribution for the MA student enrollment. One can observe from this figure that there was a direct correlation between international student enrollment growth and ethnicity growth. There has also been consistent growth of Black student enrollment each year and well as strong Asian student growth. White, Hispanic and American Indian student enrollment has fluctuated yearly. We expect the commitment of LAC scholarship funding to assist in Hispanic student growth in future years.

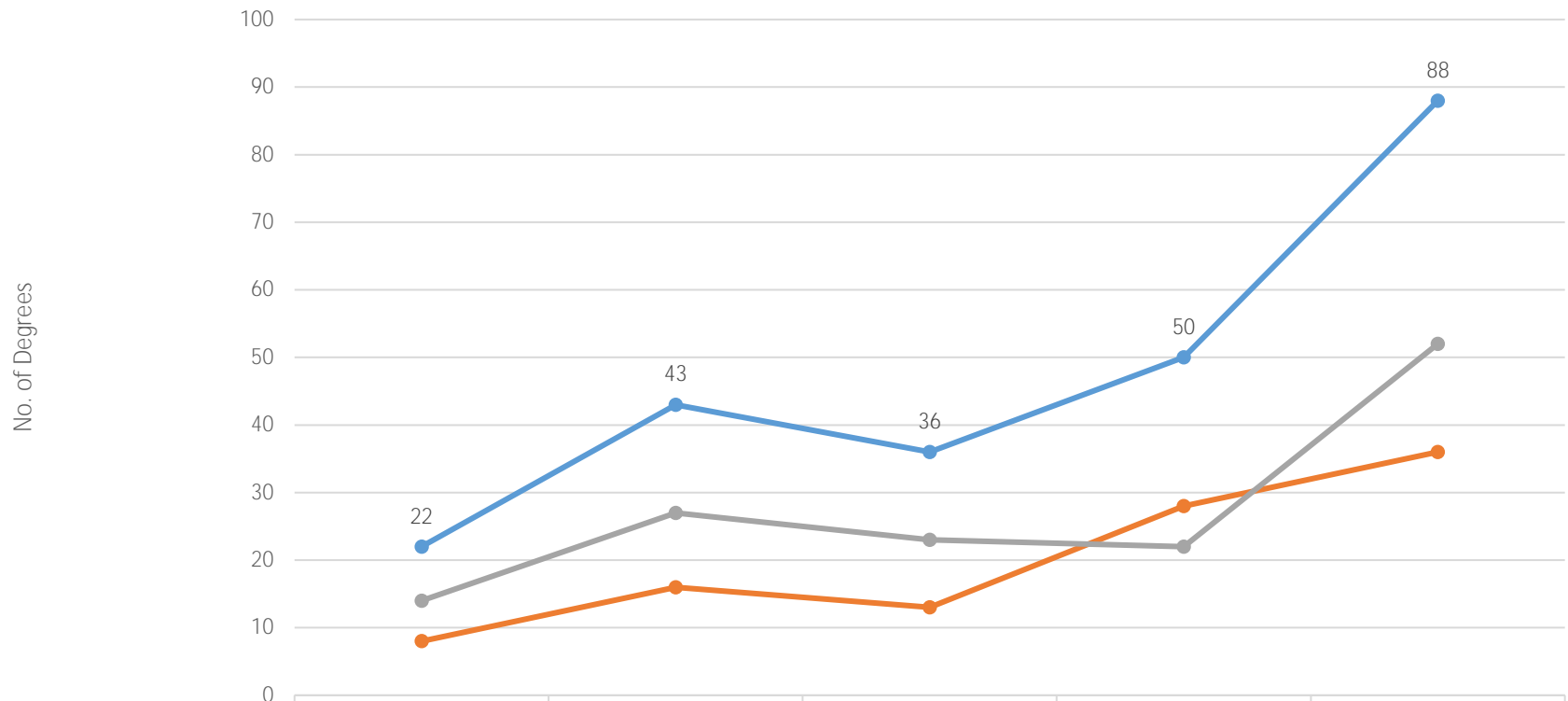


The below figures illustrate the degrees awarded trends the last five years as the program has also grown in admissions and enrollment. The largest enrollment for an academic year was in 2017-2018, and degrees awarded for 2018-2019 are projected to be the largest ever due to the mean time to degree completion.

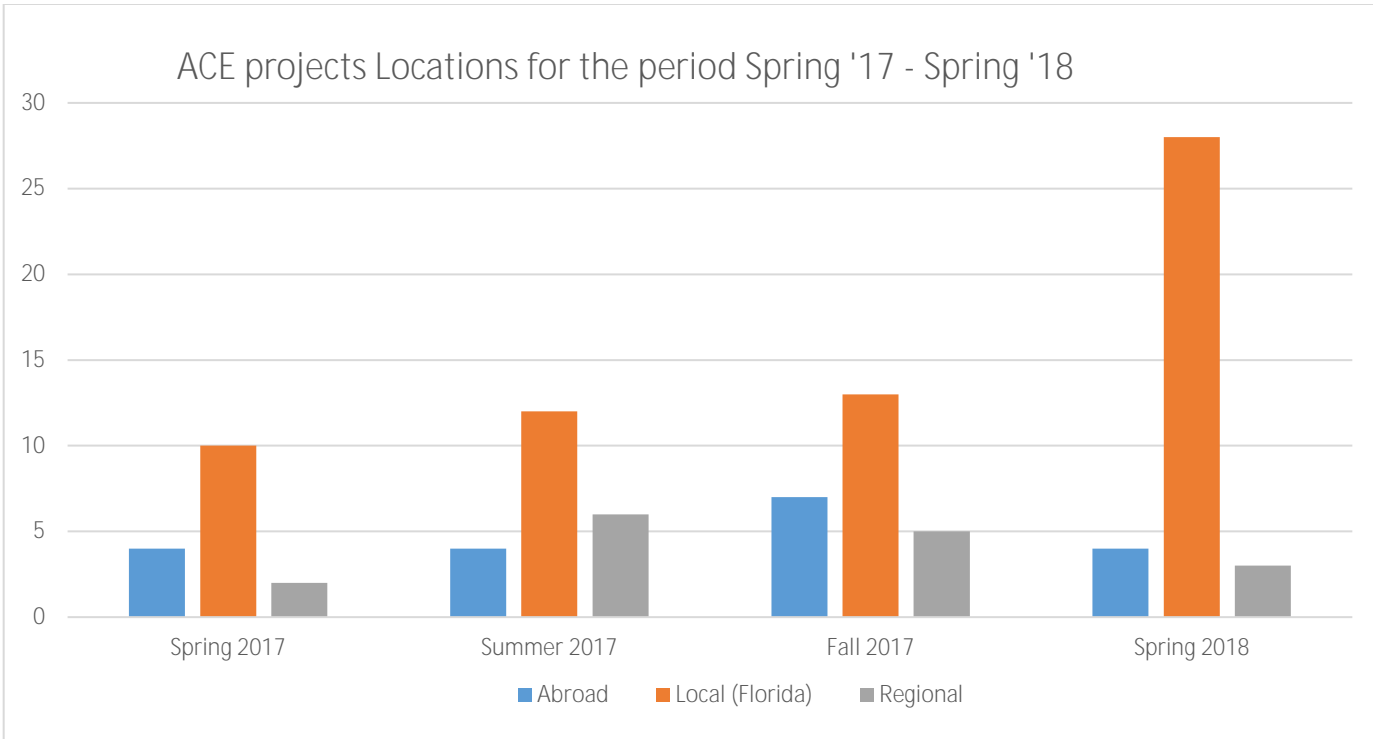


2012-13	2013-14	2014-15	2015-16	2016-17

MA GLOBAL SUSTAINABILITY, DEGREES AWARDED - GENDER





	2013-14	2014-15	2015-16	2016-17	2017-18
Total degrees awarded	22	43	36	50	88
Male	8	16	13	28	36
Female	14	27	23	22	52





The M.A. in Global Sustainability offers nine concentrations, all concentrations are available in a traditional on-campus format and online.

This program is designed to prepare students to address complex regional, national, and global challenges related to sustainability and the ability to innovate in diverse cultural, geographic, and disciplinary contexts.  

The Patel College of Global Sustainability strives to offer a dynamic curriculum, top-notch internship experiences, and overall superior education for our students.

Our graduate certificates offer students an abbreviated path to a specialization in sustainability. Graduate certificates can be earned in only 12 credit hours (four courses) and are perfect for professionals looking to enhance their skills and expertise, boost career advancement potential, and facilitate the advancement of new skills.

Certificates also functions as a gateway into the Patel College M.A. program as all credits

This certificate program will provide a general foundation for coastal sustainability. It is designed to appeal to an audience with a wide range of backgrounds and interests in the planning, policy, and management fields. The certificate will be of particular interest to those related to sustainability students, and those involved with planning and management in coastal communities.

This certificate program will provide a general foundation for coastal sustainability. It is designed to appeal to an audience with a wide range of backgrounds and interests in the planning, policy, and management fields. The certificate will be of particular interest to those related to sustainability students, and those involved with planning and management in coastal communities.

The certificate program will provide a general foundation in sustainability and thorough understanding of all forms of energy that can support a sustainable economy. It is designed to appeal to an audience with a wide range of backgrounds and career interests by addressing energy from all angles (technology, business, economics, policy, and social) unlike similar-sounding programs at other institutions, which are designed narrowly for engineering and physical sciences students.

This certificate program will provide a general foundation in sustainability and a solid understanding of key issues in food systems and safety/security. The program will cover (1) the concepts, principles, economics, and finance of sustainability, as well as transition towards a green economy; (2) food production, distribution, marketing, disposal, and policy; and (3) food safety and security regarding biological, chemical, and physical threats. It is designed for an audience of a wide range of backgrounds with career interests in the field of food sustainability and security.

This certificate program will provide a general foundation in sustainability and a solid understanding of key issues in food systems and safety/security. The program will cover (1) the concepts, principles, economics, and finance of sustainability, as well as transition towards a green economy; (2) food production, distribution, marketing, disposal, and policy; and (3) food safety and security regarding biological, chemical, and physical threats. It is designed for an audience of a wide range of backgrounds with career interests in the field of food sustainability and security.

The Patel College of Global Sustainability conducts applied research that creates sustainable solutions in a rapidly-changing world. The research is based upon USF's broad, interdisciplinary expertise in the areas of energy, water, public health, global security, and social equity. This interdisciplinary approach provides a fertile foundation for the development of unique solutions to emerging and existing problems.

- Renewable fuels and products
- Global change and the associated uncertainties
- Urban form and its influence and impact on resource management
- Urban metabolism – modelling resources flows (water, wastes, energy, people, goods....)
- Urban water – integrated urban water modelling, flexible design, transitioning
- Sustainable Tourism –

Our efforts are focused on:

- Design of cost-effective cultivation platforms
- Scale-up and operation of algae production systems
- Water, nutrient, and energy management
- Product development (fuels, cosmetics, nutraceuticals)
- Intellectual property management

Biomass is an abundant and inexpensive domestic feedstock for bio-refineries designed to produce value-added products and clean power. Florida generates sugarcane bagasse and yard waste in South Florida, citrus peel and agricultural residues in Central Florida, and woody biomass in Northern Florida.



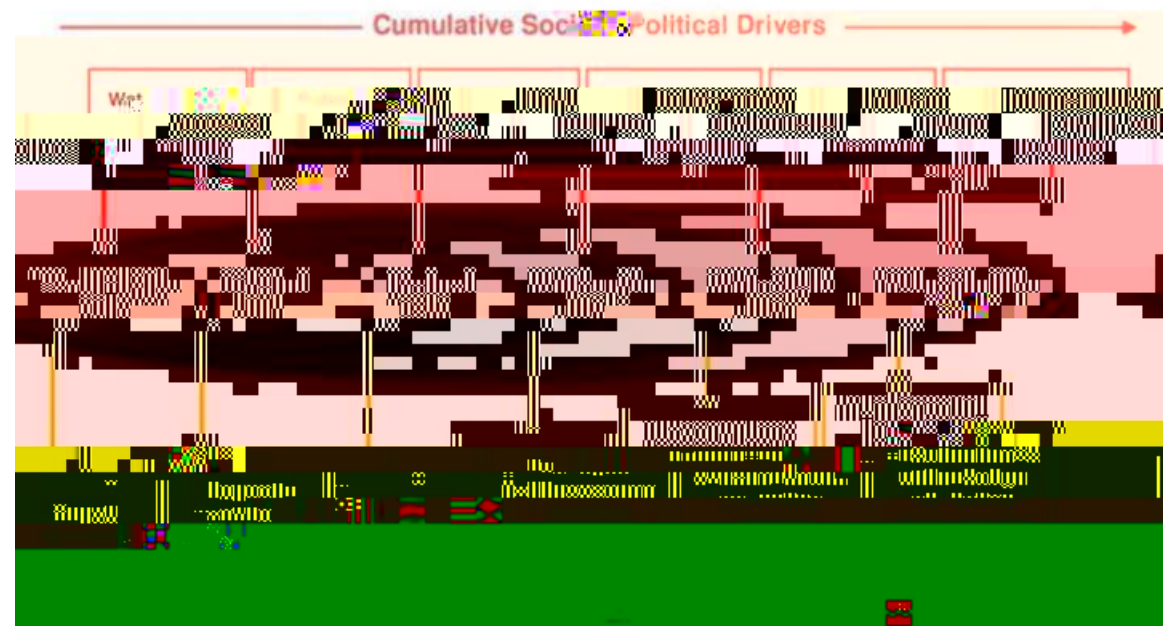
We test and optimize the conversion of various biomass

The need for transitioning of Urban Infrastructure Systems (UIS) is illustrated by the facts that the earth system is undergoing significant rapid changes which have developed from increased human activities, population growth and urbanization (Vairavamoorthy et al., 2008). Whereas 48% of the world's population presently live in cities and towns, this proportion is expected to increase to about 60% in the year 2030 aggravating the need for the transition of existing systems.

To ensure a more sustainable future there is a need for more drastic measures. Technology breakthroughs and innovative designs need to be coupled with comprehensive system changes to the urban processes, institutions, and regulations that ultimately shape our cities. Cities will be faced with difficult future strategic decisions (e.g. the choice between centralized and the decentralized systems; the choice regarding the level of involvement of individual citizens, NGOs and companies; the choice between an institutional framework where separate institutions are responsible for a certain element of the urban infrastructure system or moving towards a more integrated institutional set-up). Hence it is likely that future desired UIS will look and operate differently to existing ones and will be managed and financed differently.

US Forest Service, National Urban and Community Forestry Challenge Program.

This project will provide natural resource managers, planners, and engineers with a set of decision support tools to aid the strategic planning process for transitioning to green infrastructure systems that emphasize trees and urban forests.



This project develop and demonstrate an innovative transitioning framework from gray to green infrastructure systems for urban watersheds through the execution of the tasks outlined below and illustrated in the figure below.

PCGS has developed an open-source, Gray to Green (G2G) Decision Support Tool (DST) to aid the strategic planning process for

IUWM is an approach that includes: interventions over the entire urban water cycle; reconsideration of the way water is used (and reused); and greater application of natural systems for water and wastewater treatment. It provides an alternative to the conventional approach for an effective and efficient management of scarce water resources.

Global Water Partnership (GWP) Goal: The main goal of this project is to enhance awareness of decision makers, senior managers and practitioners on the concept and approach of IUWM and at the same time to provide the necessary tools and guidance in developing strategies and implementing IUWM on the ground.

PCGS in collaboration with the Global Water Partnership (GWP) and the World Bank (WB) has developed IUWM Toolkit and Training Package to provide an integrated solutions to water supply, sanitation and drainage challenges. IUWM Toolkit includes six main components: diagnostic tool, technology selection tool, water balance tool, stakeholder engagement guideline, institutional mapping tool, and economics and finance tool. The toolset has also been used to develop a three level IUWM Training Package that include training module for decision makers, managers and practitioners. The IUWM Toolkit and Training Package

PCGS is involved in the development of a comprehensive sanitation master plan for Seychelles. The master plan is based on an Integrated Urban Water Management (IUWM) approach, which will identify and utilize links and

Globally close to a billion people do not have access to safe drinking water and more than

et al. (2018) "Cold Climate Adaptations for Household Level Biodigestion: Food Waste to Fuel and Fertilizer Research in Portugal, Pennsylvania, New York and Germany," *Journal of Environmental Engineering and Science* 2018 (in press) (originally presented in Proceedings of International Conference on Alternative Fuels, Kayseri University, Turkey, December 2016).

., et al. (2018) Indoor Bathroom, Kitchen and Basement Biodigesters:

Mompremier, R., Fuentes Mariles O.A., , Silva Martínez, A.E., Becerril Bravo, J.E (2018). Study of the effect of pipe materials and mixing phenomenon on trihalomethanes formation and diffusion in a laboratory-scale water distribution network, *Journal of Water Science and Technology: Water Supply* 18(1) 183-192

Mompremier, R., Fuentes Mariles O.A., Silva Martínez, A.E., Becerril Bravo, J.E and (2017). Impact of mixing phenomenon at cross junctions on the variation of total coliform and *E. coli* in water distribution systems: Experimental study. *Journal of Water Supply: Research and Technology- AQUA*, 66 (5) 308-318.

. "Advancing Energy Security and Economic Growth with Biofuels" in *Energy Security and Environmental Sustainability in the Western Hemisphere*, Lexington Books, Lanham MD, 381-391 (2017).

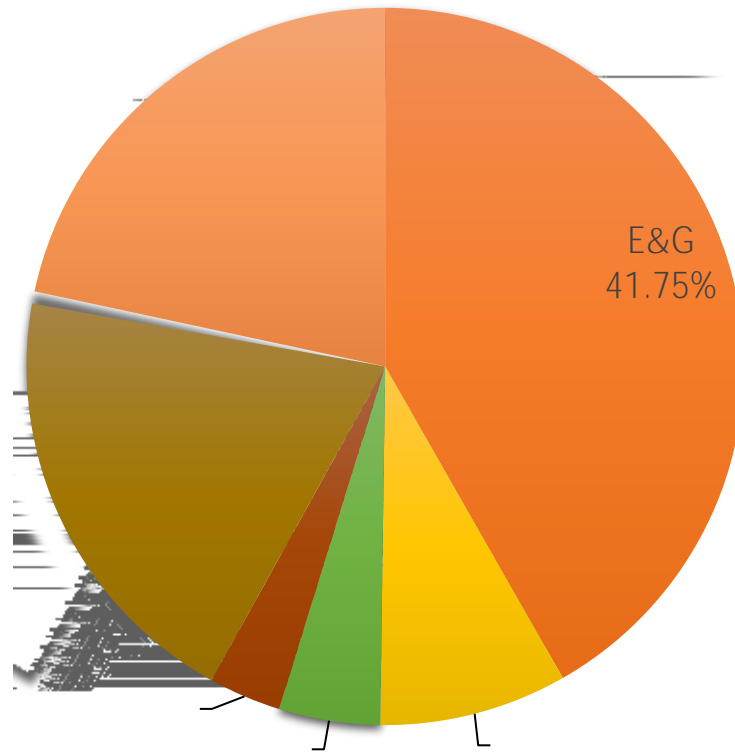
Pirasaci, T., Manisali, A.Y., Dogaris, I., , Sunol, A.K. "Hydrodynamic design of an enclosed Horizontal Bioreactor (HBR) for algae cultivation", *Algal Research*, 28, 57-65 (2017).

Yassin, M., Mahmoud, N., , and Petrusevski, B (2017). Assessment of a roughing filtration as a pre-treatment for slow sand filtration of canal water with highly variable feed water turbidity, *Desalination and Water Treatment*, 79: 221-227



E&G	\$ 1,137,172		\$ 1,137,172
Carryforward	230,655		110,500
Auxiliary	124,258		80,862
Research F&A	88,962		64,779

Contracts & Grants



**Additional Foundation Funds of \$3,449,007 as follows:

Endowments-\$3,207,988

Foundation Construction Fund-\$241,019