FLORIDA POLYTECHNIC UNIVERSITY

BOARD OF TRUSTEES
STRATEGIC PLANNING COMMITTEE MEETING

Wednesday, September 13, 2017
8:30 AM

Florida Polytechnic University
Admissions Center
4700 Research Way
Lakeland, FL 33805

Don Wilson, Chair	Dr. Sandra Featherman, Vice-Chair	Rear Admiral Philip Dur
Henry McCance	Jacob Livingston	Bob Stork

AGENDA

I.	Call to Order	Don Wilson, Chair
II.	Roll Call	Maggie Mariucci
III.	Public Comment	Don Wilson, Chair
IV.	Approval of June 7, 2017 Minutes *Action required*	Don Wilson, Chair
V.	2016-18 Strategic Planning Committee Work Plan Review	Don Wilson, Chair
VI.	2016-17 Florida Equity Report *Action required*	Kevin Calkins
VII.	2016-17 FIPR Institute Annual Report *Action required*	Dr. Brian Birky
VIII.	Closing Remarks and Adjournment	Don Wilson, Chair

DRAFT

FLORIDA POLYTECHNIC UNIVERSITY
BOARD OF TRUSTEES
STRATEGIC PLANNING COMMITTEE
MEETING MINUTES
Florida Industrial and Phosphate Research Institute
1855 W. Main St., Bartow, FL 33830
June 8, 2017 @ 10:00 AM

I. Call to Order

Committee Chair Don Wilson called the Strategic Planning Committee meeting to order at 9:56 a.m.

II. Roll Call

Maggie Mariucci called the roll: Chair Don Wilson, Vice-Chair Sandra Featherman, Trustee Philip Dur and Trustee Jacob Livingston were present (Quorum).

Other trustees present: Board Chair Frank Martin, Trustee Mark Bostick, Trustee Jim Dewey, and Trustee Dick Hallion.

Staff present: President Randy Avent, Mr. Kevin Aspegren, Ms. Gina DeIulio, Mr. Mark Mroczkowski, Dr. Terry Parker, Mrs. Maggie Mariucci, and Mr. Rick Maxey.

III. Public Comment

There were no requests received for public comment.

IV. Approval of Minutes

Trustee Dur made a motion to approve the Strategic Planning Committee meeting minutes of March 15, 2017. Trustee Featherman seconded the motion; a vote was taken, and the motion passed unanimously.

V. 2016-18 Strategic Planning Committee Work Plan

Committee Chair Don Wilson presented the 2016-2018 Strategic Planning Committee Work Plan. No changes were made and the plan will remain in place.

VI. 2017 Florida Polytechnic University Work Plan

President Avent presented the 2017 Work Plan report.

The Board of Governors presented a template for the Work Plan focusing on the following five topics: Strategy, Performance Metrics & Goals, Enrollment Planning, Academic Program Planning and University Finance Planning.

President Avent discussed various strategies including strengths, opportunities and key initiatives and investments. Priorities will include achieving ABET accreditation, enhancing new STEM degrees and programs, improving the University's research footprint to industry sponsored projects, and improving the quality of student life. Plans are in place to improve the 6-year graduation rate to a 4-year graduation rate and programs are being implemented to help improve diversity. New degree programs will be considered in 2018-2020. This will provide students with additional degree options.

President Avent brought to the attention of the Trustees that there is a correction on the percentages listed in the Teaching and Learning Performance Metrics. The corrections for the percentage of Adult undergraduates (aged 25+) enrolled are due to an initial miscalculation by the Board of Governors. For fall 2014, the percentage changes from 7% to 8%. For fall 2015 the percentage changes from 7% to 8% and for fall 2016 the percentage changes from 3% to 7%.

Institutional specific goals were discussed. Currently, there is not a Board of Trustees or Board of Governors choice metric in place. Rick Maxey confirmed that the way the policy is written, the Board of Trustees would present the Board of Governors with three metrics, one which will be selected as the Board of Governor's choice for the University. Trustee Dur expressed that industry partnerships could be a strong choice.

The University Work Plan will be presented to the BOG at the June 22, 2017 meeting.

Trustee Dur made a motion to approve and recommend to the Board the 2017 Florida Polytechnic University Work Plan, to include the correction of percentages of Adult undergraduates (aged 25+) enrolled. Trustee Livingston seconded the motion; a vote was taken, and the motion passed unanimously.

VII. Closing Remarks and Adjournment

With no further business to discuss, the Strategic Planning Committee meeting adjourned at 10:25 a.m.

AGENDA ITEM: V

Florida Polytechnic University
Strategic Planning Committee
Board of Trustees
September 13, 2017

Subject: 2016-2018 Strategic Planning Committee Work Plan Review

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Proposed Committee Action

No action required- Information only.

Background Information

At the December 7, 2016, Strategic Planning Committee meeting, the committee reviewed and voted on the committee work plan. The work plan has been updated to include their recommendations, if any.

Supporting Documentation:
Updated work plan

Prepared by: Rick Maxey, Government Relations Director

Florida Polytechnic University

Strategic Planning Committee

Work Plan 2016-2018

March 15, 2017	June 7-8, 2017	September 13, 2017	December 6, 2017
• Strategic Planning Long Range Outlook • SunTrax	• 2017 University Work Plan • Strategic Planning Phase 2	• Florida Equity Report • FIPR Institute Annual Report	• Annual Accountability Report • Strategic Planning Final
[1]March 14, 2018	[1]June 6-7, 2018	[1]September 12, 2018	[1]December 5, 2018
	• 2018 University Work Plan	• Florida Equity Report • FIPR Institute Annual Report	• Annual Accountability Report
[1]Tentative until approved by the Board of Trustees			

AGENDA ITEM: VI

Florida Polytechnic University
Strategic Planning Committee
Board of Trustees
September 13, 2017

Subject: 2016-17 Florida Equity Report

Proposed Committee Action

Recommend approval of the 2016-2017 Florida Equity Report to the Board of Trustees.

Background Information

Florida law (Section 1000.05, F.S.) and Board of Governors regulation (2.003) requires each state university President and Board of Trustees approve an Annual Florida Equity Report. The report reviews policies and practices of gender and ethnic equity with regards to academic program enrollment, student services, and employment.

Supporting Documentation:
Presentation
Florida Equity Report

Prepared by: Kevin Calkins, Director of Institutional Research

FLORIDA POLYTECHNIC UNIVERSITY

2016-2017 Florida Equity Report

Kevin Calkins

September 13, 2017

FLORIDAPOLY

Outline

FLORIDA POLYTECHNIC UNIVERSITY

2016-17 EQUITY REPORT

- Academic Program Review
  - Enrollment
  - Student Services
- Employment
  - Faculty
  - Executive/Administrative /Managerial
- Areas of Improvement/Achievement

Enrollment – Fall 2016

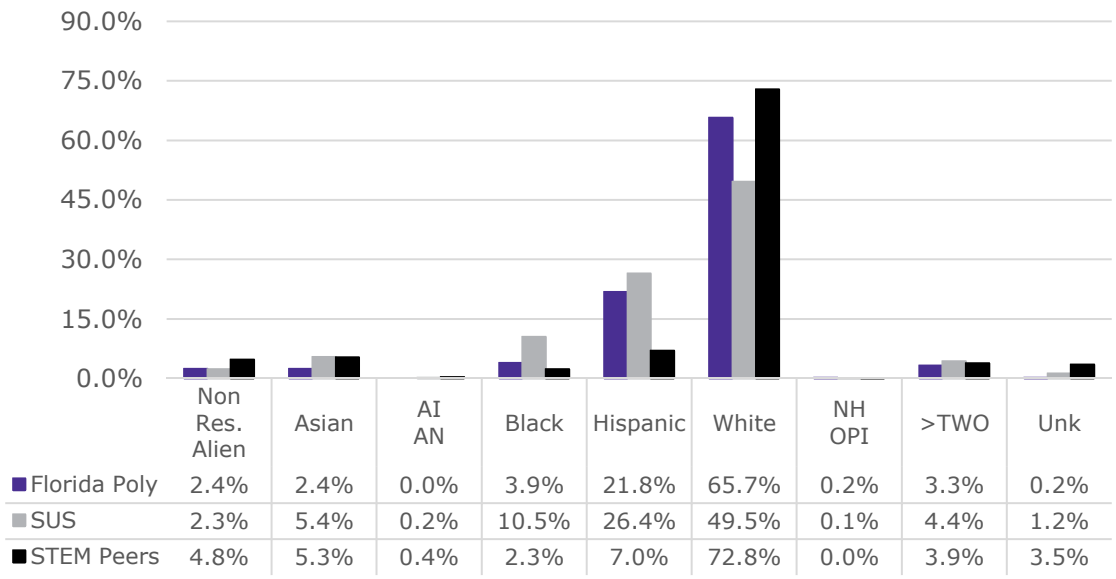
Total Headcount: 1,314

Total New Students: 512

This Equity Report focuses on incoming Fall 2016 undergraduate students.

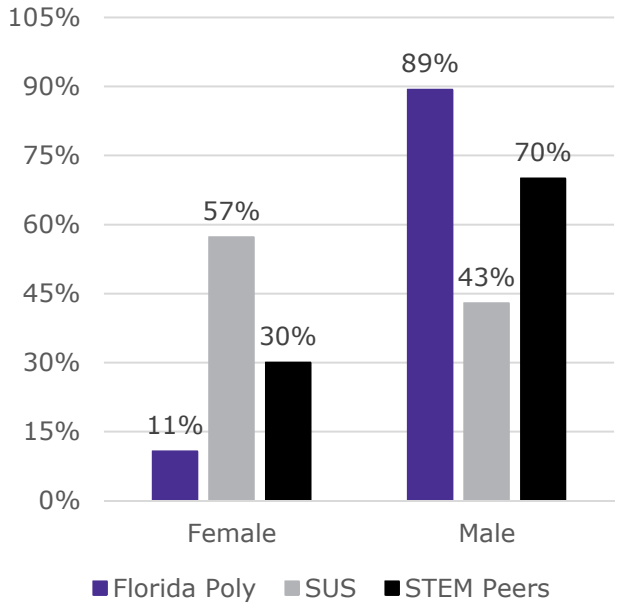
Enrollment – FTIC (Fall 2016)

Full-Time FTIC Comparison by Race/Ethnicity



	Non Res. Alien	Asian	AI AN	Black	Hispanic	White	NH OPI	>TWO	Unk
Florida Poly	2.4%	2.4%	0.0%	3.9%	21.8%	65.7%	0.2%	3.3%	0.2%
SUS	2.3%	5.4%	0.2%	10.5%	26.4%	49.5%	0.1%	4.4%	1.2%
STEM Peers	4.8%	5.3%	0.4%	2.3%	7.0%	72.8%	0.0%	3.9%	3.5%

FTIC Enrollment Comparison by Gender

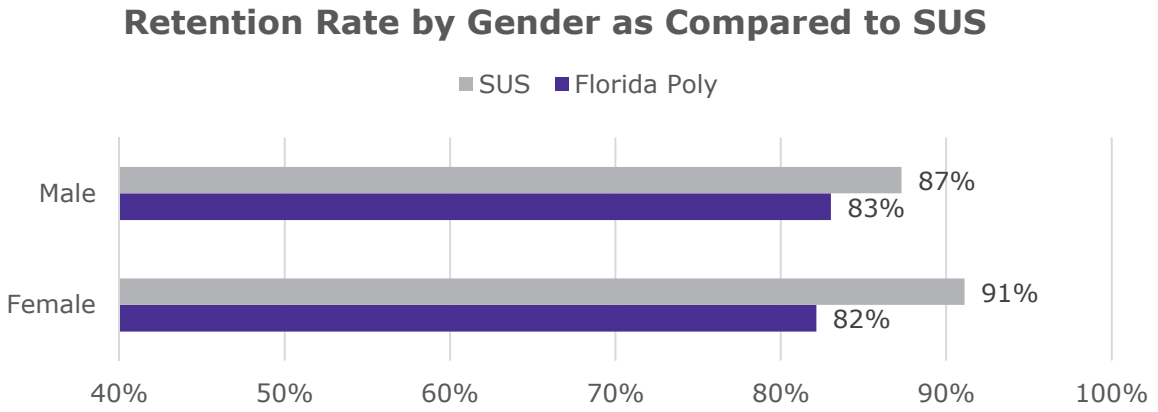


New FTIC students are more diverse than our STEM peers, although below in female students.

Retention - FTIC (Fall 2016)

	Ethnicity Gender											
Category	Non-Res. Alien	Asian	Am. Indian Alaska Native	Black	Hispanic	White	Native Hawaiian Other Pacific	>TWO	Unk	Female	Male	Total
COHORT	2	17	1	19	78	256	2	5	12	56	336	392
Category % of Total	0.51	4.34	0.26	4.85	19.9	65.31	0.51	1.28	3.06	14.29	85.71	100
After 1 Year	2	15	1	13	63	213	2	5	11	46	279	325
Retention Rate	100%	88%	100%	68%	81%	83%	100%	100%	92%	82%	83%	83%

Source: Student Instruction File. FTICs who matriculated in Fall 2015, plus those FTICs who matriculated in Summer 2015 and enrolled in Fall 2015



Although the numbers are small, the lowest retained by percent of total was Black students (68%). Female students retention is slightly less than males, both less than the SUS.

Enrollment – Transfers (Fall 2016)

	Ethnicity - Full-Time Transfers									
	Non Res. Alien	Asian	Am. Indian Alaska Native	Black	Hispanic	White	Native Hawiian Other Pacific	>TWO	Unk	Total
Category										
Male	2	3	0	4	8	30	0	0	0	47
Female	1	0	0	1	1	4	0	0	0	7
Total Fall 2016	3	3	0	5	9	34	0	0	0	54
Category % of Total Fall 2016	5.56	5.56	0	9.26	16.67	62.96	0	0	0	100

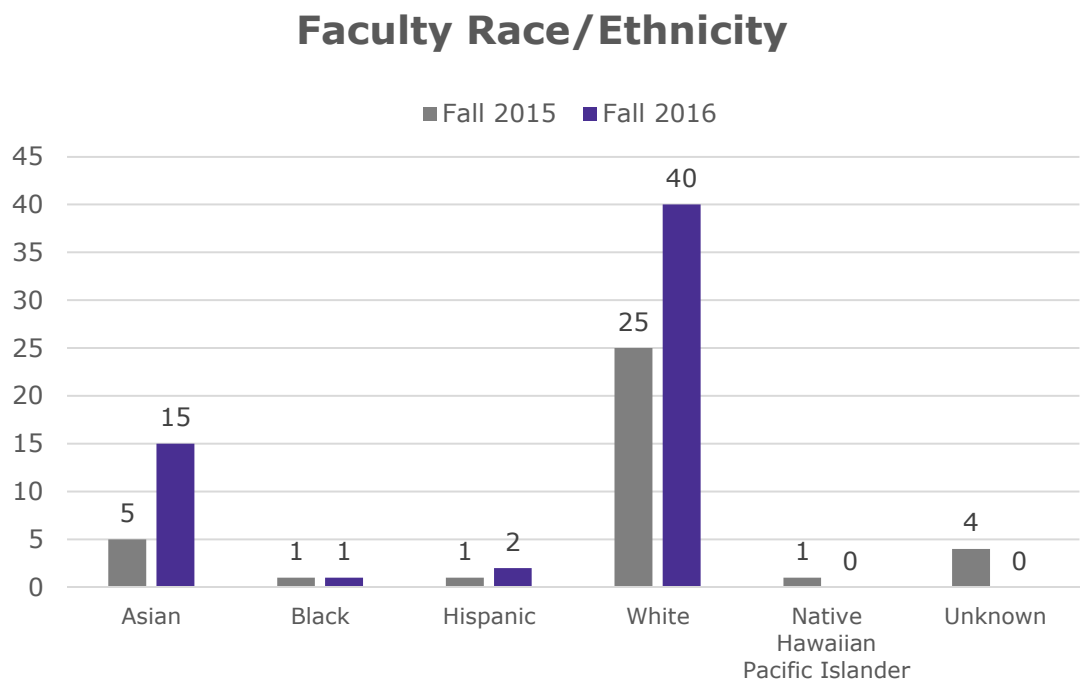
Source: BOG IPEDS Fall Transfer Enrollment by Race, Ethnicity, and gender.

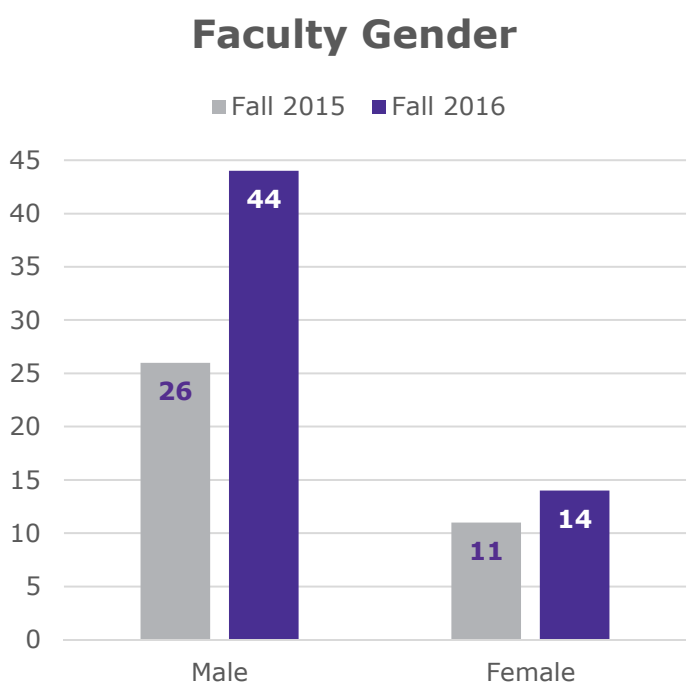
- New transfer students are a small percentage of our student body (17%).
- Other than an increase in international students (NRA), not much change from fall 2015.

Student Services

- Student Affairs was reorganized:
  - Student Academic Success Center
  - Enrollment and Student Development
- Admissions and Recruitment targeting:
  - Female applicants
  - Ways to mentor and engage
- Counseling Services:
  - Supportive networks toward diversity
  - Social justice and inclusion
- Office of Financial Aid:
  - Tools and information to all students that promotes access and affordability, including:
    - Underrepresented students
    - First generational students

Enrollment – Faculty (November 2016)





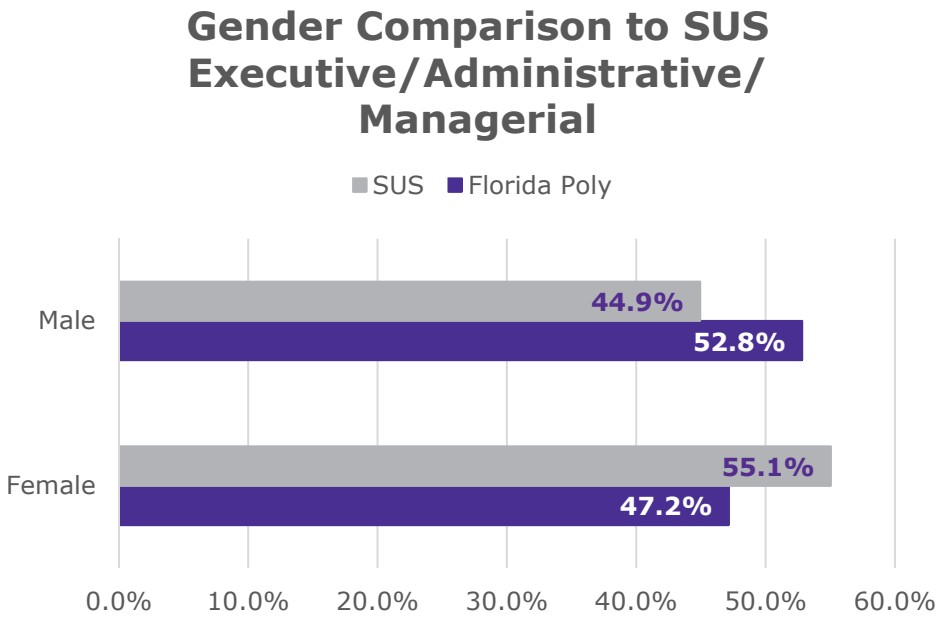
- 56% or 21 increase in Faculty – fall 2015 to fall 2016
- Largest increase for white males
- Culturally-diverse environment

Employment – Executive/ Administrative/Managerial

- Similar to SUS peers in race/ethnicity
- Slightly less females than SUS peers

FT Managerial Comparison to SUS (fall 2015)*	SUS Average (excl. FAMU & FIU)	Florida Poly (2016)
Non Resident Alien	0.5%	0.0%
Asian	3.9%	3.8%
Am. Indian/Alaska	0.1%	0.0%
Black	9.0%	7.5%
Hispanic	6.6%	0.0%
White	79.1%	88.7%
Native Hawaiian/OPI	0.1%	0.0%
>Two Races	0.6%	0.0%
Unk	0.1%	0.0%

*IPEDS Data Center. HR Component Fall 2015. http://nces.ed.gov/ipeds/datacenter/



Areas of Improvement/Achievement

- Florida Poly provides an environment of equal opportunity to all students, faculty and staff
- Admissions focuses on recruitment of female students and projects progress in upcoming years
- Human Resources is establishing systems and processes to better focus on faculty/staff recruitment and demographic reporting

FLORIDA POLYTECHNIC UNIVERSITY

2016-17 EQUITY REPORT

(DRAFT)

Florida Polytechnic University

Date Year: July 2016 – June 2017

Approved by University Board of Trustees: September 13, 2017

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Dr. Randy K. Avent

University President

September 13, 2017

Prepared by:

Kevin Calkins, Director

Office of Institutional Research
4700 Research Way
Lakeland, FL 33805
(863) 874-8545

Board of Trustees Meeting Agenda

Florida Polytechnic University
Board of Trustees
Strategic Planning Committee
September 13, 2017

Subject: 2016-2017 Florida Equity Report - Florida Polytechnic University

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Proposed Committee Action

Recommend approval of the 2016-2017 Florida Equity Report to the Board of Trustees.

Background Information

Florida law (Section 1000.05, F.S.) and Board of Governors regulation (2.003) requires each state university President and Board of Trustees approve an Annual Florida Equity Report. The report reviews policies and practices of gender and ethnic equity concerning academic programs enrollment, student services, and employment.

Supporting Documentation: 2016-17 Florida Equity Report – Florida Polytechnic University

Prepared by: Kevin Calkins, Director of Institutional Research

TABLE OF CONTENTS

EXECUTIVE SUMMARY

The equity report for Florida Poly was developed in support of the Florida Educational Equity Act [Section 1000.05 F.S.] of the K-20 Educational Code, which prohibits unlawful discrimination against students and employees in the Florida K-20 public education system, and mandates equality of access in athletics, retention and graduation rates for under-represented populations.

In addition, the Florida Board of Governors Regulation 2.003 (Equity and Access) requires appropriate student participation in programs or courses where protected classes are underrepresented, gender equity in athletics and appropriate representation of women and minorities in senior-level administrative positions and faculty positions.

This report encompasses policies and practices related to equity with regards to enrollment within academic programs; student services; and employment of faculty and Executive/Administrative/Management personnel. All data are compared to Florida Poly's 2015-16 academic year.

Information for this report was compiled with submittals from offices within the following organizational units: Student Development, Admissions, General Counsel, Human Resources, Institutional Research, Housing, Counseling and Financial Aid.

All charts presented are templates provided by the Florida Board of Governors. Any additional tables and figures are utilized to analyze data with respect to:

- Student enrollment in comparison with other State University System institutions and STEM-based peer universities
- On-campus housing demographics

Florida Poly provides equal education to all its students. As stated in our mission, we seek to: "… prepare 21st century learners in advanced fields of science, technology, engineering, and mathematics (STEM), to become innovative problem-solvers and high-tech professionals through interdisciplinary teaching, leading-edge research, and collaborative local, regional and global partnerships." Given the nature of our institution, there will be challenges with regards to gender equity in enrollment. However, initiatives are taking place to increase the female population.

The University does not have intercollegiate athletic programs. Therefore, corresponding charts are not applicable to our institution. In addition, Florida Poly does not follow tenure-track systems for our faculty.

POLICIES & PROCEDURES

Florida Polytechnic University is governed by state and federal statutes, regulations and guidelines of the Florida Board of Governors and university regulations. The University adopts policies and related procedures to dictate and guide the operations of the University when statutes, regulations and guidelines do not provide specific guidance or do not offer procedures or implementation directives necessary for efficient university operations.

Policies should neither conflict with provisions contained in applicable laws or regulations, nor merely restate or duplicate those provisions. When an existing University policy conflicts with a law, Florida Board of Governors regulation, or university regulation, such law or regulation shall take precedence over the University policy.

The University Policies are available on the "University Policies, Regulations and Rules" section of the University webpage: https://floridapoly.edu/about/board-of-trustees/university-policies-regulations-rules/

Review of Policies & Procedure

The following policies and procedures were developed to ensure equity within the University. These and additional policies and procedures will be updated annually and are available online.

Name of Policy/Procedure	Web Address
Non-Discrimination and Equal Opportunity	https://floridapoly.edu/wp-content/uploads/2017/07/FPU-1.004-Non-Discrimination-and-Equal-Opportunity-Regulation-1.14.20141.pdf
Discrimination and Harassment Complaint	https://floridapoly.edu/wp-content/uploads/2017/07/FPU-1.005-Discrimination-and-Harassment-Complaint-Policy-and-Procedures-2.5.141.pdf
Sexual Harassment	https://floridapoly.edu/wp-content/uploads/2017/07/FPU-1.005P-Sexual-Harassment-2.27.15.pdf
Admission to the University	https://floridapoly.edu/wp-content/uploads/2017/07/FPU-2.001-Admission-to-the-University-4.5.17.pdf
Student Government and Student Organizations	https://floridapoly.edu/wp-content/uploads/FPU-3.002-Student-Government-and-Student-Organizations-6.22.17.pdf
Student Code of Conduct	https://floridapoly.edu/wp-content/uploads/2017/07/FPU-3.006-Student-Code-of-Conduct-7.29.14-1.pdf
Reasonable Accommodations for Religious Observances, Practices and Beliefs	https://floridapoly.edu/wp-content/uploads/FPU-3.009-Reasonable-Accommodations-6.22.17.pdf
Student Grievance Process	https://floridapoly.edu/wp-content/uploads/2017/07/FPU-3.0031P-Student-Grievance-Process-1.17.17-1.pdf

Name of Policy/Procedure	Web Address
Anti-Hazing	https://floridapoly.edu/wp-content/uploads/2017/07/FPU-3.0062P-Anti-Hazing-Policy-4.28.15.pdf
Academic Freedom and Responsibility	https://floridapoly.edu/wp-content/uploads/2017/07/FPU.5.001-Academic-Freedom-Academic-Freedom-and-Responsibility-1.14.141.pdf
Student Attendance	https://floridapoly.edu/wp-content/uploads/2017/07/FPU-5.0010AP-Student-Attendance.pdf
University Personnel Program	https://floridapoly.edu/wp-content/uploads/2017/07/FPU-6.001-University-Personnel-Program-6.27.13.pdf
Personnel Code of Conduct and Ethics	https://floridapoly.edu/wp-content/uploads/2017/07/FPU-6.002-Personnel-Code-of-Conduct-and-Ethics-12.11.14.pdf
Employee Grievance Procedure	https://floridapoly.edu/wp-content/uploads/2017/07/FPU-6.0011P-Employee-Grievance-Procedure-11.17.14.pdf
Student Financial Aid	https://floridapoly.edu/wp-content/uploads/2017/07/FPU-7.002-Student-Financial-Aid-3.16.17.pdf
Financial Aid Accommodations	https://floridapoly.edu/wp-content/uploads/2017/07/FPU-7.0012P-Financial-Aid-Accomodations-for-Students-Needing-Reduced-Course-Loads-7.30.15.pdf
Purchasing	https://floridapoly.edu/wp-content/uploads/2017/07/FPU-8.001-Purchasing-8.28.13.pdf

Non-Discrimination Policy

The University is committed to providing and maintaining a dignified environment in which all members of the university community appreciate and respect each other. This is done by collectively sustaining a welcoming environment to work, study, and interact with one another, free from any form of unlawful discrimination. The University shall not unlawfully discriminate in offering access to any educational programs or activities or in conducting its employment practices on the basis of race, color, national origin, marital status, sex, religion, age, disability sexual orientation, gender identity, gender expression, or veteran status or any other legally protected class or basis under applicable federal and/or state laws. The University's non-discrimination policy was approved by the University Board of Trustees in January 2014 and is reviewed annually.

ACADEMIC PROGRAM REVIEWS - ENROLLMENT

Student enrollment and student services initiatives are presented and discussed in this section. Enrollment data represents student population in required reporting areas, as applicable, for Fall 2016 with a comparison to Fall 2015. Diversity-related initiatives and programs for enrolled students are described under the student services section.

Enrollment

Student enrollment at Florida Poly by gender and race/ethnicity are presented and analyzed in the following areas:

- Full-time First-Time-In-College Enrollment
- Full-time Florida College System A.A. Transfers
- Retention of Full-Time FTICs after one year

Although the equity report also requires the analysis of the following, it is too soon in the University's maturity to calculate these metrics:

- Graduation Rate of Full-Time FTICs after six years
- Bachelor's Degrees Awarded (AY 2014-15)
- Master's Degrees Awarded (AY 2014-15)
- Doctoral Degrees Awarded (AY 2014-15)
- First Professional Degrees Awarded (AY 2014-15)

Data presented and analyzed in this section utilize the Federal Integrated Postsecondary Education Data System (IPEDS) Fall Enrollment, including IPEDS gender and race/ethnicity IPEDS definitions (as follows):

Key	Term	Definition*
NRA	Nonresident Alien	A person who is not a citizen or national of the United States and who is in this country on a visa or temporary basis and does not have the right to remain indefinitely.
B	Black or African American	A person having origins in any of the black racial groups of Africa.
AI/AN	American Indian/Alaska Native	A person having origins in any of the original peoples of North and South America (including Central America) who maintains cultural identification through tribal affiliation or community attachment.
A	Asian	A person having origins in any of the original peoples of the Far East, Southeast Asia, or the Indian. Subcontinent, including, for example, Cambodia, China, India, Japan, Korea, Malaysia, Pakistan, the Philippine Islands, Thailand, and Vietnam.
H	Hispanic/Latino	A person of Cuban, Mexican, Puerto Rican, South or Central American, or other Spanish culture or origin, regardless of race.
NH/OPI	Native Hawaiian/Other Pacific Islander	A person having origins in any of the original peoples of Hawaii, Guam, Samoa, or other Pacific Islands.
W	White	A person having origins in any of the original peoples of Europe, the Middle East, or North Africa.
≥ Two	Two or more races	A person self identifies as not Hispanic, and more than one race category.
UNK	Unknown	The category used to report students or employees whose race and ethnicity are not known.

*2014-15 Survey Material: Glossary (NCES National Center for Education Statistics) December 5, 2014

The fall 2016 enrollment data is compared to the Florida State University System (SUS) and selected STEM universities considered peers based on IPEDS Fall 2015 data. STEM institutions considered in this analysis include:

- Franklin W. Olin College of Engineering
- California Institute of Technology
- Colorado School of Mines
- Missouri University of Science & Technology
- Worcester Polytechnic Institute

Total undergraduate fall 2016 enrollment at Florida Polytechnic represented 98% of the University's student population (total undergraduate headcount: 1,257). In 2016-17, 81% of enrolled undergraduate students were Full Time First Time in College and 17% were considered transfers students. Due to the nature of programs offered by the University, male student population continues to be higher than female student population (male 87%, female 13%). Compared to our previous year (Fall 2015) female population decreased by 2%. Racial/ethnic groups with higher representation on campus include White and Hispanic (White 66%, Hispanic 19%). This was true of fall 2015.

Full-Time First-Time-In-College Enrollment

During Fall 2016 there were 458 new First Time, Full Time students. Of the newly enrolled, 89% self-identified themselves as male and 11% female.

Florida Equity Report
Part I Table 1
Fulltime First Time In College Enrollment, Fall and Early Admits
Report Year: 2016-17
Florida Polytechnic University

				Ethnicity									
				NRA	Asian	AI AN	B	H	W	NH OPI	>TW O	Unk	Total
University	Term	Campus	Category										
FPU	201608	MAIN CAMPUS	Men	7	9	0	17	92	271	1	11	1	409
FPU	201608	MAIN CAMPUS	Women	4	2	0	1	8	30	0	4	0	49
FPU	201608	MAIN CAMPUS	Total FTIC Fall 2016	11	11	0	18	100	301	1	15	1	458
FPU	201608	MAIN CAMPUS	Category % of Total Fall 2016	2.40%	2.40%	0.00%	3.93%	21.83%	65.72%	0.22%	3.28%	0.22%	100.00%

Source: BOG IPEDS Fall Enrollment by Race, Ethnicity, and sex. Line 01, First time students.

The male student population continues to be higher when compared to other SUS institutions. It is a reflection of the nature of the programs offered at Florida Poly. When compared to other STEM institutions, the male population reflects more closely to Florida Poly, with an average of 70% male population within our peers (full-time FTICs).

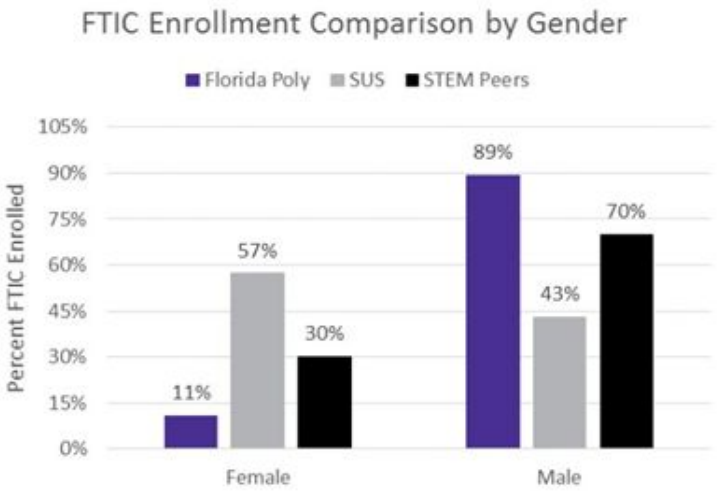
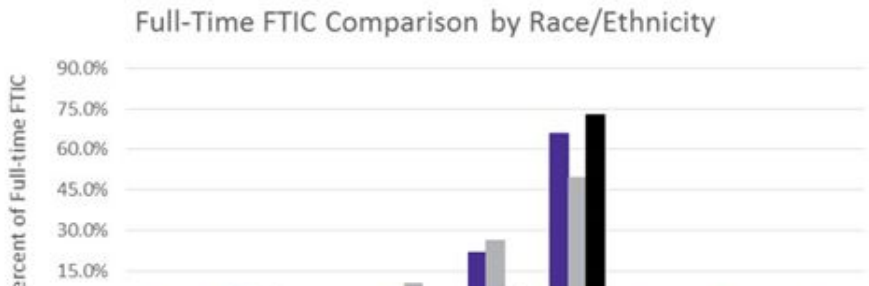


Figure 1: Full-Time FTIC SUS & Peer Comparison by gender

When comparing the FTIC racial/ethnic demographics between the Fall 2016 cohort to the fall 2015 cohort (Table 1, percent of total); Black, Hispanic and White make up the highest percentage in both cohorts. The largest percent change occurred in in Asian (decrease in 2.4%), non-resident alien (increase in 1.9%) and two or more races (increased by 2%).

As a benchmark, Florida Poly's student data was also compared to the population of the Florida counties where the majority of our students call "home": Hillsborough, Broward and Polk. This revealed no statistically significant differences with White, Hispanic and Asian categories. For Black/African American, the Florida Poly student population was significantly lower[1].

As presented in Table 1, there are two major racial/ethnic groups represented on campus: White (65.7%) and Hispanic (21.8%). This distribution shows similarities with other SUS institutions as shown in figure 2 with Hispanic students, but more similar with STEM peers in other race/ethnic groups.



	NRA	Asian	AI AN	B	H	W	NH OPI	>TWO	Unk
Florida Poly	2.40%	2.40%	0.00%	3.93%	21.83%	65.72%	0.22%	3.28%	0.22%
SUS	2.31%	5.39%	0.16%	10.51%	26.42%	49.54%	0.08%	4.35%	1.23%
STEM Peers	4.78%	5.32%	0.39%	2.31%	6.99%	72.85%	0.03%	3.86%	3.47%

Figure 2: Full-Time FTIC SUS & Peer Comparison by Race/Ethnicity

[1] Census by County – V2015. http://www.census.gov/quickfacts/table/PST045215/12057,12105,12011

Full-Time Florida College System A.A. Transfers (Fall 2014 & Early Admits)

The new incoming full-time college Transfer students at Florida Poly matriculated in Fall 2016 make up 12% of the total undergraduate population. It is important to note that the female population for transfers decreased by 61% when compared to the incoming transfers from the Fall 2015 cohort (the population is small; 18 in fall 2015 and 7 in fall 2016).

Florida Equity Report
Part I Table 2
Fulltime Transfers
Report Year: 2016-17
Florida Polytechnic University

				Ethnicity - Full-Time Transfers									
				NRA	Asian	AI AN	B	H	W	NH OPI	>TWO	Unk	Total
University	Term	Campus	Category										
FPU	201608	MAIN CAMPUS	Men	2	3	0	4	8	30	0	0	0	47
FPU	201608	MAIN CAMPUS	Women	1	0	0	1	1	4	0	0	0	7
FPU	201608	MAIN CAMPUS	Total Fall 2016	3	3	0	5	9	34	0	0	0	54
FPU	201608	MAIN CAMPUS	Category % of Total Fall 2016	5.6%	5.6%	0.0%	9.3%	16.7%	63.0%	0.0%	0.0%	0.0%	100.0%
FPU	201608	MAIN CAMPUS	Category % of Total Fall 2015	1.4%	5.7%	0.0%	7.1%	18.6%	62.9%	0.0%	1.4%	2.9%	1.0%

Source: BOG IPEDS Fall Enrollment by Race, Ethnicity, and sex. Column 2 Transfer-In.

Racial/ethnic groups with the most representation in the transfers' student body are White, Hispanic, and Black or African American, which constitute 89%. For this segment of the student body, there was a slight increase in the Black population of 2.2%, a slight decrease in the Hispanic population of 1.9%, with the largest change within the non-resident alien of 4.2%.

Retention of Full-Time FTIC after One Year

The Florida Poly retention rate for Fall 2016 was 83%. When analyzing retention of student by gender, the University retained 82.0% of the female student registered in Fall 2016, compared to 83% of the male student population. The lowest retained by percent of total was the Black students (68%) as shown in Table 3 below.

Part I Table 3
Retention of Fulltime FTIC's Entering Fall 2015 or Summer 2015 and Continuing into Fall, after 1 Year
Report Year: 2016-17
Florida Polytechnic University

			Ethnicity Gender											
			NRA	Asian	AI AN	B	H	W	NH OPI	>TWO	Unk	Female	Male	Total
rsity	Campus	Category												
FPU	MAIN CAMPUS	COHORT	2	17	1	19	78	256	2	5	12	56	336	392
		Category % of Total	0.51	4.34	0.26	4.85	19.9	65.31	0.51	1.28	3.06	14.29	85.71	100
		After 1 Year	2	15	1	13	63	213	2	5	11	46	279	325
		Retention Rate	100%	88%	100%	68%	81%	83%	100%	100%	92%	82%	83%	83%

Source: Student Instruction File. FTICs who matricuated in Fall 2015, plus those FTICs who matriculated in Summer 2015 and enrolled in Fall 2015

In comparison to SUS institutions, the University's retention was below the average for both males and females, as shown in figure 3. Of note, the female retention in fall 2015 was 92%.

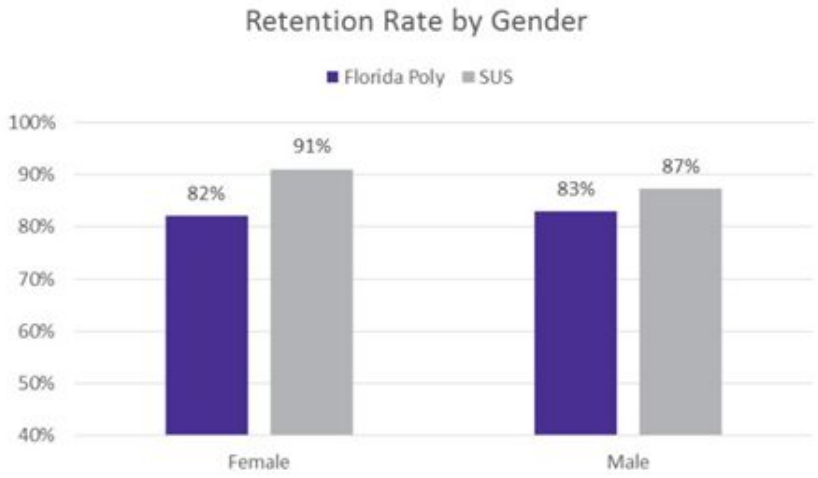


Figure 3: Retention Rate by Gender Comparison (SUS)

Graduation Rate and Degrees Awarded

The tables and data related to student graduation rate and degrees awarded were not included within this report as Florida Poly did not have graduates during the reporting period of AY 2015-2016.

Student Services

This section will present current data, services provided and initiatives for each office within student services at Florida Poly.

Student Affairs

Student Affairs for Florida Poly is a combination of Student Academic Success Center and Enrollment and Student Development. These two divisions advocate a holistic approach to education that goes beyond STEM classroom learning. The divisions strive to enhance the opportunities for our students to participate fully in the University experience. The Divisions encourage, support and provide guidance for students' extracurricular activities, while providing the best resources for a fulfilling and rewarding collegiate experience.

Student Development oversees activities related to student life on campus, including residential living, student activities and programming, leadership, multicultural outreach and admissions and enrollment services. The Academic Support Services oversees counseling and disability services, retention, academic success center, and library services. Both divisions function to ensure non-discrimination on the basis of race, color, national origin, gender, religion, age, disability, marital status, veteran status or any other basis protected by law.

Admission to Academic Program

The Admissions Office at Florida Polytechnic University has a mission to value diversity and has made conscious efforts though community outreach and campus events to increase female and minority student interest. The departmental goal is to use targeted recruitment efforts to increase interest and admissions applications. The following events have taken place and are continuing over the next academic year to increase female students:

Admissions Events

- Poly Connects: Accepted student events for all accepted students- We have created specific female meetings following the general event for incoming female students. This involves taking current female students and matching them with incoming female students to discuss resources on campus for female students and answer questions about what it is like to be a female student at Poly. We also pair parents together and answer their questions about having their student attend Florida Poly.
- Start Up Days: Admissions Summer Melt Event- Thrive program (a staff organized program to engage female students) assembled to create programming for female students. We invite all incoming female students to participate in an opportunity to meet other incoming female students as well as meet staff and current female students. The meetings introduce female students to services on campus, as well as make connections with other students. Parents are also encouraged to participate and have the opportunity to speak with Housing, Admissions, and the Police Departments in and informational session.

Recruitment Efforts

- Admissions Counselors are targeting recruitment efforts toward female students. When recruiting in the high schools, counselors had conversations with guidance staff and administrators to talk about potential female students that might be a great fit for Florida Poly, and STEM programs.
- Tour Guide efforts are made to pair current female tour guides with incoming students for campus tours.

Counseling Services

The Office of Counseling Services provides mental health counseling for students needing help working through and overcoming personal problems. Counseling sessions are free, private and confidential. Sessions are tailored to accommodate each person’s needs. Students are encouraged to ask any questions they may have about treatment. This office also coordinates academic and campus accommodations for students with mental, physical and developmental disabilities.

The office acknowledges the integral importance of background and culture in shaping all of us, and we value the individual diversity that each student brings to campus. We strongly support student diversity, social justice and inclusion of persons of different and/or disadvantaged backgrounds. We recognize the importance of multicultural

awareness in creating a campus climate of acceptance and belonging. As such, we are committed to advocating for students who identify as persons of color, LGBTQIA students, persons with disabilities, low-income and first-generation college students, international students, persons with diverse religious faiths or practices, military veterans and non-traditional aged college students, among others.

Club and Intramural Athletics

The Florida Polytechnic Intramural Sports program provides students, and faculty/staff a non-intimidating, safe and engaging fitness environment, in order to pursue healthier lifestyle choices. Our goal is to encourage healthy interaction through active and safe lifestyle opportunities for students and the greater University community, which strengthens learning and personal growth.

The Florida Polytechnic University Campus Recreation and Fitness Department creates a safe environment for providing fair, equitable, and non-discriminatory programs. These programs improve the health and welfare of students and value cultural diversity, gender equity, principles of fair play, and amateur athletic competition throughout the University community.

Student Financial Assistance

The Office of Financial Aid at Florida Poly is a student-centered department dedicated to assisting students and their families with acquiring funds to pursue an education at Florida Poly.

Florida Poly currently participates in Institutional, Florida Department of Education, and Federal Student Aid programs. By being current participants in these student financial assistance programs the University agrees to:

Comply with:

1. Federal and State Department of Education student aid program statutes, regulations, and policies governing each program used by Florida Poly.
    a. Florida Polytechnic University Institutional Aid program statutes, regulations, and policies governing each individual program that the Office of Financial Aid awards to current students;
    b. Title VI of the Civil Rights Act of 1964, barring discrimination on the basis of race, color, or national origin;
    c. Title IX of the Education Amendments of 1972, barring discrimination on the basis of sex;
    d. Section 504 of the Rehabilitation Act of 1973, barring discrimination on the basis of physical handicap; and
    e. The Age Discrimination Act of 1975
2. Acknowledge that the Department, State, and Accrediting agencies share responsibility for maintaining the integrity of the SFA programs and that these organization may share information about the institution without limitation; and

3. Acknowledge that the institution must, prior to any other legal action, submit any dispute involving the final denial, withdrawal, or termination of accreditation to final arbitration.

The Office of Financial Aid provides tools and information to all students, including underrepresented and first generation students, that promote college access and affordability.

- Federal Pell Grant Eligible students: Florida Poly began disbursing Federal Pell Grant in Spring 2017. During our first semester of Pell utilization, 16% of our undergraduate population were Pell Grant eligible. In this first semester of Pell eligibility Florida Poly demonstrated its commitment to assisting our students with economic disadvantages.
- First Generation Matching Grant: A grant available through the State of Florida that is matched by Florida Poly for the academic year.
- Institutional Need-Based Scholarships: Scholarships that assist students with proven financial need.
- Latin American / Caribbean Scholarship: Pursuant to FL Statute 1009.21(10)(e), Florida Poly offers scholarships to students from an eligible Latin American / Caribbean country to assist in the institutional fees.
- Cashcourse.org: A student centered website dedicated to teaching students about their personal finances while attending college. Students may sign up for free and utilize numerous tools to assist in their financial literacy.
- Free Financial Literacy Workshops: The Office of Financial Aid regularly offers free financial literacy workshops for students, led by industry professionals on numerous financial topics.
- FAFSA Assistance Workshops: The Office of Financial Aid regularly hosts FAFSA workshops to assist students navigate the yearly application.

On Campus Housing

Florida Polytechnic University, in partnership with VESTCOR Companies (Florida Poly's on-campus housing provider), is committed to providing quality on-campus housing to our student population.

Our partnership with VESTCOR is committed to creating and maintaining safe, inclusive communities that welcome and accept people of all identities. We are committed to delivering our students a top-notch academic experience and a rich campus life experience, while demonstrating acceptance and respect for the diverse backgrounds, lifestyles, and experiences within the Florida Poly community that enrich the learning process.

Chart 1 below presents the on-campus housing resident students' distribution by age, gender, and race/ethnicity. Data presented in this table does not follow race/ethnicity categories as specified by IPEDS, but captured data from VESTCOR.

On Campus Housing Population		Fall 2016	
Number of Residents		Number of On-Campus Residents	Percent of Total
		627	100.0%
Age of Residents	16	1	0.2%
	17	17	2.7%
	18	297	47.3%
	19	89	14.2%
	20	98	15.7%
	19	92	14.7%
	>21	33	5.2%
On Campus Housing Population		**Fall 2016**	
Gender of Residents	Male	539	86.0%
	Female	88	14.0%
Ethnicity of Residents			
American Indian of Alaska Native		1	0.16%
Asian		5	0.78%
Black or African American		11	1.7%
Hispanic or Latino		39	6.2%
Native Hawaiian or Other Pacific Islander		1	0.16%
White		363	57.9%
Not Specified		207	33.1%

Chart 1: On-Campus Housing Demographics

Student Employment – Education and Work Environment

Florida Poly employs students for on-campus part-time jobs based on need, while ensuring equal opportunity and equity. Jobs are posted on the University HR Careers website. Students are able to gain work experience and develop professional skills, while at the same time keep their educational as priority. During the 2015-16 academic year, federal work-study funds were not awarded.

Student personnel, regardless of employee classification, are handled in a manner consistent with Florida Poly's non-discrimination, equal opportunity and diversity policies.

Overall Effectiveness in Enrollment

All student activities, from application through course completion, strived to not discriminate on the basis of race, color, religion, national origin, sexual orientation, veteran's status, disability, age, marital status, or gender identity/expression.

Because of the nature of our STEM mission, gender equity will continue to be a challenge. However, the goal for Admissions is to use targeted recruitment efforts to increase interest and admissions of women students.

Other functional units within the University are taking initiatives to create a diverse environment to all students, visitors, faculty and staff. The Women In STEM program continues to be a way to support the female population on campus. The Women in STEM Education or WISE program "serves as a resource, hub and network for Florida Poly women in STEM discipline. It seeks to raise awareness of the achievements of women in STEM fields, as females are disproportionately under-represented in STEM education and STEM industry[3]." The program held its second event in March 2017 with the aim to foster alignment, partnership and collaboration among students, university scholars and industry leaders. It was open to both the campus community, partner companies and the general public.

The Office of Institutional Research conducted the Student Satisfaction Inventory administrated by Noel-Levitz in Spring 2017 and campus-questions on diversity and campus climate were included. The survey was delivered electronically to all registered students and 28% of students invited participated in the survey. The diversity questions, the importance to the students and corresponding satisfaction percentages follow:

Question Title	Importance	Florida Poly Satisfaction	National Satisfaction
The campus is safe and secure for all students	6.45	72%	51%
Faculty are fair and unbiased in their treatment of individual students.	6.42	72%	56%
Students are made to feel welcome here.	6.18	66%	61%
There is a strong commitment to diversity on this campus.	5.19	56%	70%
Residence hall staff are concerned about me as an individual.	5.43	47%	44%
Students from different backgrounds feel comfortable here.	6.07	72% (3% > 2016)	Not Available
The campus staff are caring and helpful.	6.34	68%	59%
The level of ethnic and cultural diversity of this campus is satisfactory.	5.37	56% (4% < 2016)	Not Available

EQUITY IN INTERCOLLEGIATE ATHLETICS

Florida Polytechnic University does not have intercollegiate athletics, nor does the University participate in any state and/or national athletics programs. This section is not applicable to the Institution.

Table 1. Sex Equity in Athletics Update

Element	Assessment	Area for improvement? (check if yes, and describe on form below)
1. Sports offerings		
2. Participation rates, male and female, compared with full-time undergraduate enrollment		
3. Availability of fa... *defined as ... practice, facilities*		
4. Schola... athletes		
5. Funds		
a) the ath... whole		
b) admin		
c) travel allowanc		
d) recrui		
e) compa		
f) publici		
g) other s		
6. Provisio... supplies		
7. Scheduling of games and practice times		
8. Opportunities to receive tutoring		
9. Compensation of coaches and tutors		
10. Medical and training services		
11. Housing and dining facilities and services		

Not Applicable to Florida Polytechnic University

Table 2. Sex Equity in Athletics - Areas for Improvement

Areas for improvement	Program for improvement	Timetable

EMPLOYMENT REPRESENTATION

Faculty and Staff – General Comments

The campus community is proud of the full spectrum of its diversity — encompassing differences in race, ethnicity, gender, age and more. We embrace the contributions that differences offer. We are committed to providing a working and learning environment in which all students and all members of the faculty and staff are able to realize their full potential.

A Diversity Committee was established and tasked with analyzing diversity-related data and recommend initiatives to create a more diverse environment to all faculty and staff. The committee held a few meetings and made recommendations surrounding hiring and recruitment processes, specifically targeting some alternative recruitment strategies.

Our diversity initiatives and strategies are designed to attract, develop, and advance the most talented individuals regardless of their race, sexual orientation, religion, age, gender, disability status or any other dimension of diversity. Our approach to diversity is based on a belief that we have accountability for success in this area. We provide our people with access to training and tools to help increase their awareness and understanding of differences and why they matter, so their actions can contribute to our high-performing workplace culture.

Diversity is a concept that implies the inclusion of many characteristics that differentiate us from each other. At Florida Poly, we value the many perspectives that arise from a variety of cultures, races, gender, religions, national origins, ages, physical and cognitive capabilities, sexual orientations, and other ways we identify ourselves. By our commitment to hiring a diverse staff, we will have access to different perspectives that can optimize team's creativity and productivity.

The University implemented an Enterprise Resource Planning (ERP) human resource information system (HRIS), Workday that included the development of an electronic recruiting module known as Careers. This has streamlined many manual processes and has also improved the candidate experience when applying for jobs at the University. The Careers recruiting module provides the ability for candidate to voluntarily self-identify when completing the job application to collect important recruiting data. In addition to this, the University has also established contracts with Inside HigherEd, HireEd, and the Chronicles to further broaden our recruiting efforts.

PROTECTED-CLASS REPRESENTATION IN THE TENURE PROCESS

Florida Polytechnic University does not have a tenure process, therefore this section is not applicable to our Institution.

Florida Equity Report
Part II Table 1
Category Representation - Tenured Faculty
Report Year: 2016-17
Florida Polytechnic University

Not Applicable to Florida Polytechnic University

University	Indicat											Female	Male	Total
FPU	Fall 2016										0	0	0	0
FPU	Fall 2015										0	0	0	0
FPU	Percentage Ch from Fall 2015 2016										0	0	0	0
FPU	Fall 2011										0	0	0	0
FPU	Percentage Ch from Fall 2011 2016										0	0	0	0
FPU	Area for impro compared with n standards? (Check yes)	MAIN CAMPUS	0	0	0	0	0	0	0	0	0	0	0	0

Source: IPEDS Human Resources 2015 and IPEDS Human Resources 2016 Preliminary Data.

IPEDS Human Resource Fall 2016 and Fall 2015, instructional faculty only. Does not include Research or Public Service only faculty.

Promotion and Tenure Committee Composition

Florida Polytechnic University does not have a tenure process, therefore there is no promotion and tenure committee in our Institution.

Category Representation – Tenured Instructional Faculty

Florida Polytechnic University does not have a tenure process as all faculty follow a non-tenure model. Faculty are offered fixed term, multi-year contracts that are renewed based on performance.

Florida Equity Report
Part II Table 2
Category Representation - Tenured-Track Faculty
Report Year: 2016-17

Not Applicable to Florida Polytechnic University

University												Male	Total
FPU	Fall 2										0	0	0
FPU	Fall 2										0	0	0
FPU	Perc from 2016										0	0	0
FPU	Fall 2										0	0	0
FPU	Perc from 2016										0	0	0
FPU	Area compa standards yes)	MAIN CAMPUS	0	0	0	0	0	0	0	0	0	0	0

Source: IPEDS Human Resources 2015 and IPEDS Human Resources 2016 Preliminary Data.

IPEDS Human Resource Fall 2016 and Fall 2015, instructional faculty only. Does not include Research or Public Service only faculty.

Category Representation – Non-Tenured Instructional Faculty

In Fall 2017, full-time non-tenured earning faculty at Florida Polytechnic University increased by 56.8% from fall 2015. A 27.3% change occurred for the female population and 69.2% change for males when compared to Fall 2015. White racial/ethnic group continues to be highly represented at 68.4% (67.6% in fall 2015) of the full-time faculty population on-campus.

Florida Equity Report
Part II Table 3
Category Representation - Non-Tenure-Earning Faculty or Faculty at Non-Tenure Granting Universities
Report Year: 2016-17
Florida Polytechnic University

			Ethnicity											
			NRA	Asian	AI AN	B	H	W	NH OPI	>TWO	Unk	Female	Male	Total
University	Indicator	Campus												
FPU	Fall 2016	MAIN CAMPUS	0	15	0	1	2	40	0	0	0	14	44	58
FPU	Fall 2015	MAIN CAMPUS	0	5	0	1	1	25	1	0	4	11	26	37
FPU	Percentage Change from Fall 2015 to Fall 2016	MAIN CAMPUS	0.0%	200.0%	0.0%	0.0%	100.0%	60.0%	-100.0%	0.0%	-100.0%	27.3%	69.2%	56.8%
FPU	Fall 2011	MAIN CAMPUS	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
FPU	Percentage Change from Fall 2011 to Fall 2016	MAIN CAMPUS	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
FPU	Area for improvement, compared with national standards? (Check is yes)	MAIN CAMPUS	0	0	0	0	0	0	0	0	0	0	0	0

Source: IPEDS Human Resources 2015 and IPEDS Human Resources 2016 Preliminary Data.

IPEDS Human Resource Fall 2016 and Fall 2015, instructional faculty only. Does not include Research or Public Service only faculty.

Category Representation – Executive/Administrative/Management (IPEDS data includes all personnel aligned with Standard Occupational Categories (SOC)

Florida Poly had 53 employees categorized as executive, administrative and management as of November 1, 2016. Female employees continue to be 56% of the total as last year. White and Black racial groups are the highest and correspond to 89% and 8%, respectively.

When compared to Fall 2015, both the female and male population increased by 56% and 17% each. When compared to other institutions in the State System with available IPEDS data, Florida Poly full-time managerial staff by racial/ethnic group is within the percentages reported. A comparison of gender between Florida Poly and the other SUS institutions indicates fewer females as shown in figure 4 below.

Florida Equity Report
Part II Table 4
Category Representation - Executive/Administrative/Managerial
Report Year: 2016-17
Florida Polytechnic University

			Ethnicity											
			NRA	Asian	AI AN	B	H	W	NH OPI	>TWO	Unk	Female	Male	Total
University	Indicator	Campus												
FPU	Fall 2016	MAIN CAMPUS	0	2	0	4	0	47	0	0	0	25	28	53
FPU	Fall 2015	MAIN CAMPUS	0	1	0	4	1	33	0	0	1	16	24	40
FPU	Percentage Change from Fall 2015 to Fall 2016	MAIN CAMPUS	0%	100%	0%	0%	-100%	42%	0%	0%	-100%	56%	17%	33%
FPU	Fall 2011	MAIN CAMPUS	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
FPU	Percentage Change from Fall 2011 to Fall 2016	MAIN CAMPUS	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
FPU	Area for improvement, compared with national standards? (Check is yes)	MAIN CAMPUS	0	0	0	0	0	0	0	0	0	0	0	0

Source: IPEDS Human Resources 2015 and IPEDS Human Resources 2016 Preliminary Data.
IPEDS Human Resource Fall 2016 and Fall 2015, non-instructional Management Occupations 11-0000.

Full Time Managerial Staff Comparison to SUS (fall 2015)*												2016
	FAMU	FAU	FGCU	FIU	FSU	NCF	UF	UCF	UNF	USF (Main)	UWF	FL Poly
NRA	1.9%	1.1%	1.9%	0.5%	0.0%	0.0%	0.1%	0.4%	0.6%	0.6%	0.0%	**0.0%**
Asian	3.2%	4.9%	3.8%	3.7%	0.6%	4.3%	2.6%	4.2%	3.6%	7.3%	3.5%	**3.8%**
AI/AN	0.0%	0.0%	0.0%	0.3%	0.0%	0.0%	0.1%	0.3%	0.3%	0.0%	0.3%	**0.0%**
B	87.6%	13.0%	13.2%	11.6%	8.7%	4.3%	5.8%	10.6%	10.0%	6.2%	9.5%	**7.5%**
H	0.3%	8.6%	5.7%	47.5%	4.1%	8.7%	5.1%	10.5%	5.5%	7.6%	3.5%	**0.0%**
W	6.7%	71.5%	75.5%	35.6%	85.5%	82.6%	84.4%	72.9%	79.6%	77.9%	82.0%	**88.7%**
NH/OPI	0.0%	0.0%	0.0%	0.0%	0.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**0.0%**
>TWO	0.3%	0.9%	0.0%	0.6%	0.6%	0.0%	1.4%	1.0%	0.3%	0.3%	1.3%	**0.0%**
Unk	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.4%	0.1%	0.0%	0.3%	0.0%	**0.0%**

*IPEDS Data Center. HR Component Fall 2015. http://nces.ed.gov/ipeds/datacenter/

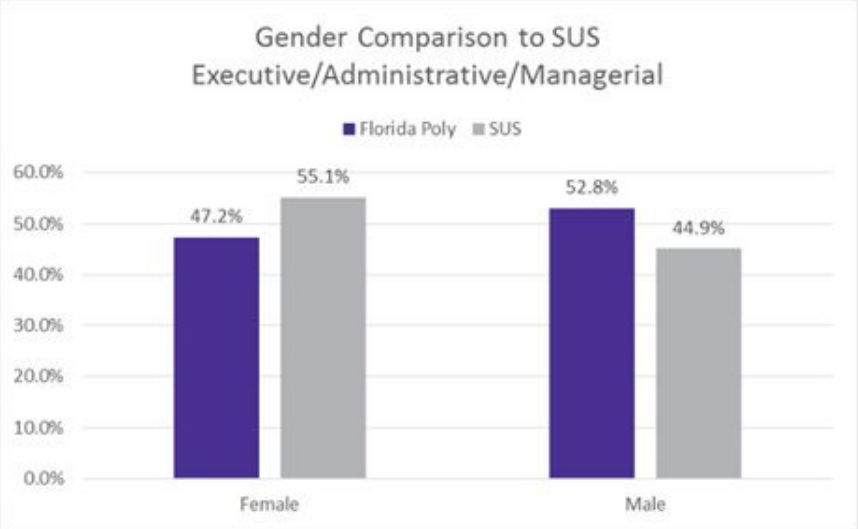


Figure 4: Executive/Administrative/Managerial Gender Comparison (SUS)

AREAS OF IMPROVEMENT/ACHIEVEMENT

Areas for Improvement Pertaining to Academic Services, Programs, and Student Enrollment
All student activities, from application through course completion, strived to not discriminate on the basis of race, color, religion, national origin, sexual orientation, veteran's status, disability, age, marital status, or gender identity/expression. Because of the nature of our STEM mission, gender equity will continue to be a challenge. It is the goal of Admissions and Academic Affairs to use targeted recruitment efforts in an effort to increase interest and applications from women.
Areas for Improvement Pertaining to Sex Equity in Athletics
Not applicable as Florida Poly does not have intercollegiate athletics, nor does the University participate in any state and/or national athletics.
Areas for Improvement Pertaining to Employment
As with any newly established organization, diversity in our faculty and staff is a work in progress. We strive to distribute all of our job opportunities to many different outlets in order to reach the best diversity in our applicant pools. Many of our positions are advertised nationally and help us to reach applicants from many different backgrounds and experiences. With the University establishing Workday as an Enterprise Resource Planning (ERP) and a Human Resource Information System (HRIS), Florida Poly now has more of an opportunity for targeted retention and reporting. Part of this implementation included a module known as Careers with further development of this module over the next year. This streamlines the manual processes of recruiting, allows for better diversity data capture and improves the candidates experience when applying. The University has also established contracts with Inside HigherEd, HireEd, and the Chronicles to further broader our recruiting efforts. This includes researching additional diversity advertising sites and vendors to market our positions to specific groups and fields.

OTHER REQUIREMENTS

Florida Polytechnic University is committed to equal opportunity for students within its educational programs and services offered, and to a diverse environment for all faculty and staff. The information collected in Fall 2015 and presented in this report will be used as a benchmark for future improvements and goals.

Budget Plan

The University Budget Plan includes operating funds to effectively meet various commitments and expectations with respect to achieving equal educational opportunity goals for students, faculty and staff.

President' Evaluation

The 2016/17 goals/objectives for the President's include increasing the diversity of our students.

Top Administrator's Evaluations

Efforts will be made to be more systematic in incorporating outcomes in evaluations for specific administrators beyond the President.

AGENDA ITEM: VII

Florida Polytechnic University
Strategic Planning Committee
Board of Trustees
September 13, 2017

Subject: 2016-17 FIPR Institute Annual Report

Proposed Committee Action

Recommend approval of the 2016-2017 FIPR Institute Annual Report to the Board of Trustees.

Background Information

On April 20, 2012, Governor Scott signed legislation that re-established the Florida Industrial and Phosphate Research Institute within Florida Polytechnic University. Section 1004.346, Florida Statutes, requires approval of an annual report which outlines the expenditure of the funds appropriated to the university from the Phosphate Research Trust Fund and describes the various phosphate-related projects and institute operations funded by those moneys.

Supporting Documentation:
Presentation
FIPR Institute Annual Report

Prepared by: Dr. Brian Birky, Interim Executive Director, FIPR Institute

FLORIDA POLYTECHNIC UNIVERSITY

FIPR Institute Annual Report

Brian K. Birky

September 13, 2017

FIPR Institute History

- Founded in 1978
  - To be an unbiased source of scientific information and research regarding the phosphate industry and its effects on local communities and the environment
- Purpose
  - To conduct research on reclamation of mined lands, phosphate processing technology, and public and environmental health
  - To educate stakeholders
- The Phosphate Research and Activities Board oversees expenditures from the Phosphate Research Trust Fund
  - 2 members from phosphate industry appointed by Governor
  - 1 member from an environmental organization appointed by Governor
  - 1 member appointed by the Secretary of FL Dept. of Environmental Protection
  - 1 member is the President of Florida Polytechnic University

FIPR Institute History (Cont.)

- FIPR was placed within Poly in its May 2012 establishing legislation and was officially accepted by the BOT in November 2013
- The legislature told us what to do, how we should do it, and how our work is funded
  - State funding is much less today than in 1978
  - The revised legislation allows the Institute to pursue additional funding through grants, business partnerships, consulting, and service contracts
  - I took over as Executive Director in July 2011 and while severance tax funding continues to decline, I have reduced spending and increased fundraising efforts

Current Mission

- FIPR's mission is still phosphate-driven, but we can work with other industries
  - The Institute is funded via a severance tax on the phosphate industry
  - Tax money is only spent on the Florida phosphate industry
  - Other industries must provide funding to FIPR for research services
- Phosphate research
  - Land reclamation and public health are fairly mature, i.e. research has developed viable technologies and answers
  - Beneficiation research is still active and may apply to other industries
  - The future of the phosphate industry depends on high-tech research in areas such as automated sampling, robotics, control systems (process controls), gaming/training, sensors, remote sensing, big data analytics, precision agriculture, etc.
- Increased emphasis on supporting the education mission of Florida Polytechnic University
  - This part of the mission is self-directed
  - Fund and mentor faculty and student research

Outline

- Introduction
- **Five-Year Trends**
- **Annual Report**
- **Summary**

Sustainability

- FIPR's mission and vision are aligned with the global theme of sustainability
  - Although still largely traditional, research focuses on
    - Waste reduction
    - Elimination of legacy waste burdens for future generations
    - Byproduct use and commercialization
  - As a member of the DOE Critical Materials Institute, FIPR leverages on federal research funding and encourages industry to co-extract critical materials
    - Uranium
    - Rare Earth Elements

Non-tax Funds

- Physical and chemical characterization of large mineral deposits
- Sample analysis
- Testing beneficiation reagents
- Consulting projects

- Sulfur energy and carbon utilization with fuel recycling and no carbon emissions
- Partnership to market a co-developed flotation reagent
- Partnership to market advanced mineral separation technologies

Poly Alignment

- HR, business processes, IT, library services, Workday
- Education Program merged with Poly Outreach
- Supporting faculty and students with research advice, mentoring, poster judging, Sustainability Competition sponsorship, guest teaching, joint proposals
- Established internal FIPR research proposal process for Poly (1 funded, 2 in pipeline)
- Coordinating the FIPR Institute's 5-year Strategic Plan with the Poly Strategic Plan

FLORIDAPOLY

Center of Excellence

Fertilizer International, No. 465, March/April 2015

The US keeps up its excellent work

The United States is acknowledged to have pioneered modern phosphate production but is facing new challenges as its output declines. We profile seven organisations determined to cement the country's reputation as a global centre of excellence for the phosphate industry

Mineral statistics can be deceptive. US phosphate production peaked at 54.4 million tonnes in 1980, accounting for 37% of world production that year. Production has slid inexorably since

has built up an extraordinarily strong and sophisticated manufacturing supply chain. More than 95% of US mined phosphate goes straight to phosphoric acid prod tion. This is then transformed into liqu

competition. But the US industry's depth and breath of expertise, and track record of technological innovation, still gives it a competitive edge globally. The following seven profiles help explain why the US phosphate sector still punches above its weight – and continues to capture new markets for its products and services.

Troubleshooting and problem solving

One pivotal organisation that has long played a role in helping the US phosphate dustry innovate, develop and grow the **Florida Industrial and Phosphate Research Institute (FIPR)** (*Removing*

- FIPR is internationally recognized as the global Center of Excellence in phosphate research
  - Contenders, most notably IMPHOS, have not been successful
  - Existing international relationships enhance our position, e.g. Rothamsted Research (UK), International Atomic Energy Agency (IAEA, Vienna), International Fertilizer Association (IFA, Paris), International Fertiliser Society (IFS, London), United Nations (UN, Geneva)

Outline

- Introduction
- Five-Year Trends
- **Annual Report**
- **Summary**

FY 16/17 Annual Report

Fiscal Year 2016/2017 Annual Report

Florida Industrial and Phosphate Research Institute

Phosphate Chemical Processing Site

Pending Approval by the Florida Polytechnic University Board of Trustees

September 13, 2017

Contents (Pages 1-4)

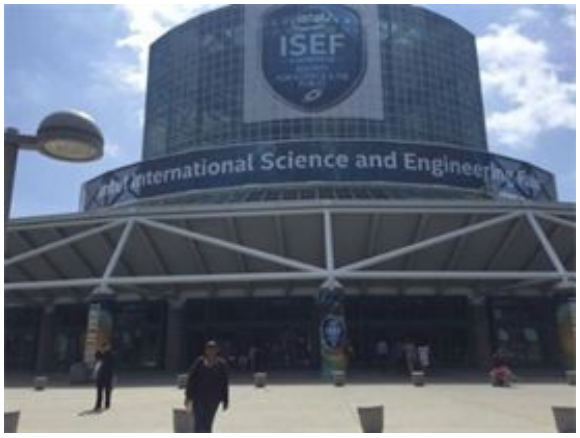
Phosphogypsum Stack with Sinkhole in One Compartment

- Executive Director's message
  - Environmental issues
  - Sustainability
  - Critical materials
- Financial report
  - The Institute's operations are financed through a severance tax on the phosphate industry
  - Trust fund balance ended the year at $7,563,064
  - Auxiliary account balance increased to $677,501
  - Throughout the Institute's history it has operated in the black and within budget

Contents (Pages 5-8)

Director Steve Richardson in Radio Panel Discussion

International Science and Engineering Fair

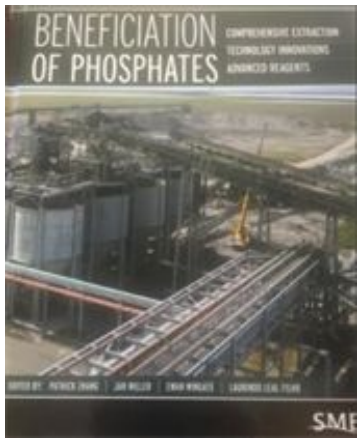


- Community and business engagement
  - Florida Ag in the Classroom
  - Bartow Chamber of Commerce and Leadership
  - Leadership Polk
  - Bartow Community Healthcare Foundation
  - Girls Incorporated
  - Polk Vision's *Building a Healthier Polk*
  - Girl Scouts of West Central Florida
- Awards and achievements
  - Staff members serve: on Boards, on Expert Working Groups, as Honorary Chairs, and as Science Fair Judges
- Information program
  - Library
  - Education outreach team

Contents (Pages 9-12)

Participants of a CMI Workshop at FIPR Institute

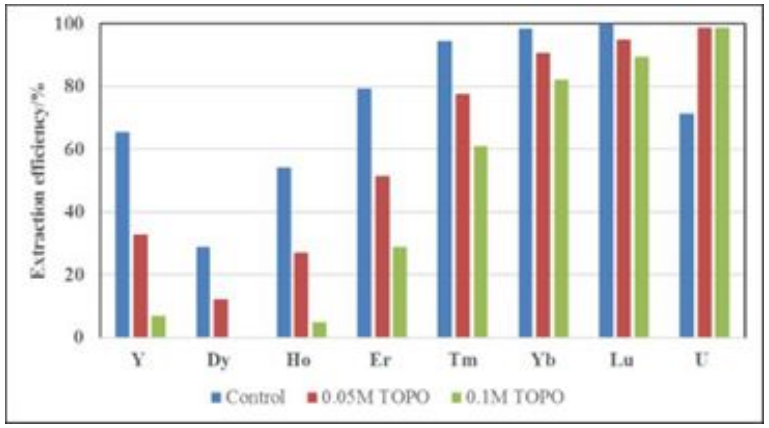
Book Edited by Patrick Zhang



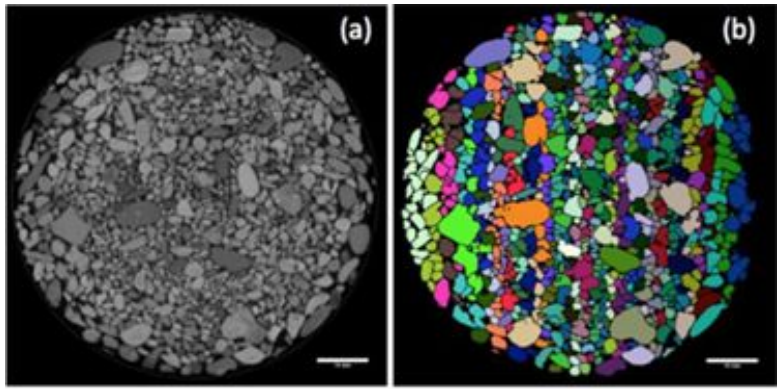
- Presentations and publications (28 items)
  - Workshops & conferences organized, journal publications, presentations, posters, book chapters
- Press interviews (17 items)
  - 11 print, 4 television,1 radio,1 attributed quote (without interview)
- Course and conference collaboration with Florida Polytechnic University
  - Participated in Florida Energy Systems Consortium (FESC) grant for Renewable Energy and Sustainability Course, Florida Polytechnic University, Fall 2016
  - Sponsored Florida Academy of Sciences 81st Annual Conference at Florida Polytechnic University, March 10, 2017

Contents (Pages 13-29)

Extraction Efficiencies of REEs and U from Phosphoric Acid



CT Images: (a) 2D HSXCT and (b) Watershed Segmented Images of a High Dolomite Phosphate Pebble



- 11 FIPR research projects
  - Rare Earth Elements (REE)
  - Elimination of clay ponds
  - MgO separation from ore
  - Slow release fertilizers
  - On-site X-ray tomography
  - Deep well injection and leaching
  - Water treatment and P recovery
  - Biological control of Brazilian peppertree
  - Biological control of cogongrass
  - Vegetation cover on phosphogypsum stacks
  - Native wildflower and grass establishment

Summary

- The FIPR Institute FY 2016/2017 Annual Report is presented for your approval
- It was a busy year with environmental issues, public presentations, and press interviews
- Research collaboration between Institute staff and the faculty and students of the University is continuing, and will be much more visible in next year's report

Fiscal Year 2016/2017 Annual Report

Florida Industrial and Phosphate Research Institute

Phosphate Chemical Processing Site

Pending Approval by the Florida Polytechnic University Board of Trustees

September 13, 2017

Pending Approval by the Phosphate Research and Activities Board

September 15, 2017

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Phosphate Research and Activities Board Members

Randy Avent, Florida Polytechnic University, Chairman

Terrence Baker, PCS Phosphates

Jeffrey Narrow, The Mosaic Company, Vice-Chairman

Mark Rachal, Audubon Florida

Vishwas Sathe, Florida Department of Environmental Protection

Florida Industrial and Phosphate Research Institute

Directorial Staff

Brian K. Birky, Ph.D., Executive Director, Research Director, Public and Environmental Health

Steven G. Richardson, Ph.D., Research Director, Reclamation

Patrick Zhang, Ph.D., Research Director, Mining and Beneficiation

Vacant, Research Director, Chemical Processing

Gary Albarelli, MLS, Director of Information Programs

Executive Director's Message – Dr. Brian Birky

After over three decades of service as a state agency, the Florida Industrial and Phosphate Research Institute was re-established within Florida Polytechnic University in 2012. Since that time, the Institute has integrated its administrative functions, library services, and K-12 STEM Education Program within the University. The Institute is currently focusing on cooperative research projects involving University faculty and students, which will be ready for inclusion in the FY 17/18 Annual Report.

In this report, we describe the Institute's financial condition, community and business engagement, awards and achievements, information program, technical exchange, and research.

The Institute's financial condition is fairly stable, but is characterized by fluctuations up to hundreds of thousands of dollars per year. The Institute experienced a decline in the Trust Fund balance this year, but remained within its budget.

The Institute's staff is active in the community through organizations such as Florida Ag in the Classroom, Bartow Chamber of Commerce and its Leadership Program, Leadership Polk, Bartow Community Healthcare Foundation, Girls Incorporated, Polk Vision's Building a Healthier Polk, Girl Scouts of West Central Florida, and others.

Staff members serve on Boards and Expert Working Groups, as Honorary Chairs of conferences and universities, and as Science Fair Judges locally and internationally.

The Institute's library is open to the public, and contains both print and electronic resources. The in-house collection is largely phosphate-related, but there are broader scientific publications and periodicals, especially in energy and chemical engineering disciplines. In addition, the library is connected to other libraries of the state university system through Florida Polytechnic University.

The Education Program is fully integrated within the University's Community Outreach Program. STEM lessons developed at FIPR are used in the program to engage students and prepare them for further education and careers in high-tech fields.

The Institute, most notably through its Directors, continued to exchange technical information with other scientists and the public via workshops, conferences, publications, and presentations. An exception to the typical information pathways was a spike in the number of press interviews this year. This is directly attributable to two events of environmental and social significance.

The first event was a sinkhole that opened under a cell within an active phosphogypsum stack. 215 million gallons of process water held in the cell breached a synthetic liner and spilled into the Upper Floridan Aquifer. This water moves slowly and pumping seems to have contained the plume. Extensive on-site monitoring and off-site testing of wells used for drinking water continues as the sinkhole is plugged and sealed. In the weeks following the event, FIPR's role was to provide general information about stacks, water characteristics, and public health.

The second event was a lawsuit filed on behalf of plaintiffs living in two Lakeland communities that were built on reclaimed, formerly mined lands. The main public health concern was exposure to external irradiation due to naturally occurring radioactive materials (NORM). The Florida Department of Health, Bureau of Radiation Control responded with extensive gamma radiation surveys of the communities and in-house measurements on request. FIPR's role was to put the radiation levels, potential human doses, and risk in perspective. As such, this is mainly a matter of public education, but also reinforces the position that special care must be taken to remediate land intended for residential development such that radiation is reduced to acceptable levels, and that housing construction is optimized to keep radon concentrations to <4 pCi/L (picocuries per liter) of air with a preferred level of <2 pCi/L (USEPA).

While the broad areas of research have remained the same, specific topics of interest change as needed. Mining, beneficiation, chemical processing, land reclamation, and public and environmental health remain focal areas for research. Incidents like those mentioned previously may spawn new research, or evaluation of existing technology, in microseismology, sensors to detect liner breaches, sensors that can withstand extreme pressure and exposure to acid, and more.

However, our main drivers continue to be sustainability, comprehensive extraction, and critical materials. These drivers were discussed in detail in last year's report. Social, economic, and environmental components are inherent to sustainability. The social license to operate is key to how industry responds to events such as those that occurred this year, and how the public judges that response.

Financial Report

FIPR Institute's research and operation are funded through the Phosphate Research Trust Fund. This trust fund receives its income from a portion of the severance tax paid to the state for each ton of beneficiated phosphate rock concentrate and pebble (not dry) as measured coming off the belt at the washer of each beneficiation plant.

Since the Institute's inception in 1978, the severance tax rates, distribution, and associated fees have varied greatly, as has the rate of mining. This has, in turn, resulted in widely variable rates of income for the Phosphate Research Trust Fund. The distribution to the Institute's trust fund has varied from 5% to 12.5% of the collected tax during our history. The distribution was 5.6% for this fiscal year, and the tax rate was $1.80 per ton of rock severed.

The FIPR Institute's Executive Director provides a summary of expenditures and the trust fund balance at public meetings of the Institute's Phosphate Research and Activities Board. A more detailed summary is included herein.

Trust Fund Balance

July 1, 2016	$7,873,182
June 30, 2017	$7,563,064

Operations

Income	
Gross Severance Tax[1]	$1,768,280
LESS Fees to Dept. of Revenue	($113,407)
Net Income	$1,654,873
PLUS Interest	$113,908
Total Income	$1,768,781
Expenses	
Research	($347,690
Internal Operations[2]	($1,731,209)
Total Expenses	($2,078,899)
Change in Trust Fund	($310,118)

[1]Per Section 211.3103, F.S.

[2]"Internal Operations" includes staff salaries and benefits, and expenses for the Education Program, Library, and Laboratories. The Institute's Research Directors and technicians spend most of their time directing or conducting research. The remaining staff deliver information and education services to the public and schools, or provide office support within the Institute. Since "Internal Operations" also includes research done by the FIPR Institute staff, the portion of the annual income expended on research is substantial. Of the amount that is approved by our Board for specific research projects ("Research" in the summary table), the largest shares typically go to universities and private firms. Their research is conducted under the direction of the Institute.

Auxiliary Funds (Not from the Severance Tax)

According to Florida Statutes 1004.346 enacted in 2012, the FIPR Institute may also secure funding from grants and other available sources, enter into contracts, and provide consulting services. Revenue from these sources is deposited into an auxiliary account.

Auxiliary Account Balance

July 1, 2016	$601,208
June 30, 2017	$677,501
Income	
Consulting	$68,439
PLUS Interest	$9,236
Total Income	$77,675
Total Expenses	($1,382)
Change in Auxiliary Account	$76,293

Awards and Grants (Not from the Severance Tax)

Critical Materials Institute (CMI) Account

Revenue	$166,598
Expenses	($166,598)
Change in CMI Account	$0

Florida Wildflower Foundation (FWF)

Revenue	$3,593
Expenses	($2,875)
Change in FWF Account	$718[1]

[1]The remaining funds were approved as carry over for additional research.

The overall financial status for FY 2016-2017, which combines the Trust and the Auxiliary Funds, was $8,474,390 as of July 1, 2016. The final amount, as of June 30, 2017, is $8,240,565; showing a net decrease of $233,825.

Community and Business Engagement

The FIPR Institute interacts with local community and business organizations in a variety of ways, such as providing our facilities for public use, participating in networking and fundraising activities, and supporting regional conferences and symposia. The Early Learning Coalition, the Polk County School Board, and the Bartow Chamber of Commerce use the FIPR Institute Conference facilities regularly for their meetings. Finally, the Institute's employees are active in the community and serve on various committees and boards.

- Gary Albarelli
  - Serves on the Board of Directors of Florida Ag in the Classroom
- Shannon Medley
  - Served on the Bartow Chamber of Commerce Board of Directors Executive Committee as Vice President of Public Affairs until December 2016
  - Chairs the Bartow Chamber's Leadership Bartow Program; completed year 1 of 2
  - Chairs Leadership Bartow Leadership Alumni Committee
  - Serves on the Board of Directors for the Bartow Community Healthcare Foundation
- Marie Wilmot
  - Graduate of both Bartow Chamber of Commerce Leadership and Leadership Polk
  - Serves on Girls Incorporated Board of Directors
  - Serves on Polk Vision's *Building a Healthier Polk* Alignment Team
  - Instructor at the Lake Wales YMCA and volunteers as an instructor at other community outreach facilities and events
    - Lakeland Coleman Bush Community Center
    - Bartow Carver Recreational Center
    - Polk County School Board Employee Wellness Programs
    - Bartow's Juneteenth event
    - Winter Haven's Fitness by the Fountain
  - Chairman for Bartow's fitness program - Fortress Fitness, which was recognized as a Healthy Weight Community Champion 2017 by the Florida Department of Health, State Surgeon General, Community Champion Recognition Program
  - Volunteers with Bartow Chamber of Commerce and Bartow Area Chamber Foundation Quality of Life Programs
- Kate Beamon
  - Volunteers each summer at Wekiva Youth Camp in Apopka, Florida with the 7th Grade Primitive Tent Camping Program

- Volunteers as a Leader for a Girl Scouts of West Central Florida (GSWCF) with a focus on STEM and outdoor activities
- Serves as volunteer GSWCF Service Unit Manager (South Lakeland/Mulberry)
- Recruiter, Event Coordinator, Public Relations Contact and Assistant Product Sales Coordinator for the Mulberry Highlands Service Unit of GSWCF
- Consults GSWCF staff on STEM activities and events
- Elected as an Area Delegate for voting at GSWCF governance meetings
- Selected and funded as one of five National Delegates to represent all GSWCF volunteers for governance voting at the National Council Session at the Girl Scouts USA national convention, G.I.R.L. 2017, in Columbus, Ohio in October 2017. This national convention of Girl Scouts only occurs once every three years.

Awards and Achievements

The Institute's staff members continue to serve on prestigious panels and committees, and their counsel is in constant demand internationally.

Dr. Brian Birky is Co-Convener of the PG NORM Working Group (Expert Panel) of the International Fertilizer Association (IFA). He and Dr. Patrick Zhang are also Technical Consultants (United States) to the International Atomic Energy Agency (IAEA).

Dr. Patrick Zhang is a member of the Editorial Board for Mineral Processing and Extractive Metallurgy Review journal. He is also Honorary Chair for the Center for Comprehensive Utilization and Sustainable Development of Phosphate Resources, China University of Geosciences.

Dr. Steve Richardson is an Advisory Committee Member, Polk County Bone Valley Special Area Study. He also serves on the Lake Wales Ridge Environmental Advisory Committee.

Ms. Indira Sukhraj is an International Science and Engineering Fair (ISEF) Judge, and reviews grant proposals for National Science Teachers Association (NSTA). She is also a judge for the Florida Junior Academy of Sciences and the Army Education Outreach Program's National eCybermission Challenge. She is a member of the Polk Regional Science Fair's SRC (Scientific Review Committee), is an aquatics expert for Tampa Bay Regional Envirothon, and is involved with LE/AD (Lakes Education Action Drive) to educate the public about phosphate in the environment. She also works with Texas Instruments on STEM Education, beta testing new equipment and integrating science and engineering.

Information Program

The Information Program primarily consists of the Institute's Library, widely considered the world's most extensive collection of phosphate-related reference materials, the K-12 Education Program, which brings the science of Florida's phosphate mining and processing into the classroom, and communications, which provides information on phosphate-related issues to the public. The Institute uses the internet to share information about its activities and promotes the websites www.fipr.state.fl.us and www.floridapolytechnic.org.

The FIPR Institute Library provides books, periodicals, maps, and many other reference materials for use by the public. Everyone is welcome to use the Library, both in person and through online services, and residents with a valid Florida driver's license may check out many of the books in our collection and other specific items. The Library also participates in an interlibrary loan program to enhance accessibility to information for all members and their patrons. As a part of the State University System (SUS), the Library can also access many research articles of interest to research scientists and students.

The Library continues to serve a diverse population of patrons, primarily phosphate industry professionals, but also students and members of the public, answering questions and providing literature searches about phosphate mining, technology, and history; phosphogypsum technology and potential utilization of this by-product; mine reclamation; and issues concerning the environment and public health as related to the phosphate industry.

The FIPR Institute's K-12 STEM Education Program has substantially merged with Florida Polytechnic University's Education Outreach Team. Activities for the fiscal year are summarized below.

- STEM Activities with the YMCA
- Robotics partnership with FedEx
- After school STEM Program partnership with the City of Winter Haven Cultural Center
- After school STEM Program partnership with Parker Street Ministries in Lakeland, FL
- In-classroom STEM lessons - Polk, Hillsborough, Pasco, Sumter, Highlands, Duval, Clay, Lake, Indian River and Hardee Counties
- Water, Wings and Wild Things at Circle B Bar Reserve
- Collaboration with industry partner, Mosaic, in designing and presenting an activity at Agrifest
- MERIT Program

- Host on campus STEM activities at the University's iconic Innovation, Science and Technology Building (IST)
- Independence Academy
- RISK Group
- Heartland Group
- Earth Day - Sustainability
    - Florida Polytechnic Earth Day sponsored by SGA
    - Earth Day at Bok Tower Gardens
- Science and Engineering Fairs
    - Project Mentor
    - Assorted Local School Fairs in Polk, Lake, and Indian River Counties
    - Polk Regional Science and Engineering Fair
    - Heartland Regional Fair (Hardee, Okeechobee, Hendry, Glades, Highlands, Lee Counties)
    - Florida State Science and Engineering Fair
    - INTEL ISEF[1]
- Participated in the Great American Teach-In at several schools in Polk and Hillsborough Counties
- Florida Polytechnic Collaboration
    - Working with Admissions to inform them of upcoming activities; they are incorporating our team into some of the campus tours
    - Collaborating with the Presidential Ambassadors by providing them with educational outreach opportunities
    - Recruiting Florida Polytechnic student volunteers at Club Row
- Staff Continuing Education
  Florida Association of Science Teachers (FAST) Conference

[1]The INTEL ISEF is the largest event of its kind. There are other international science fairs, but none as large as the INTEL-sponsored one. Approximately 60 countries have students and judges participating each year. The event is an excellent way to stay informed about STEM education around the world, and can be a venue for recruiting top international students to Florida Polytechnic University.

Technical Exchange

FIPR Institute staff shared technical information and expertise at conferences and workshops both locally and abroad. We frequently serve as organizers, session chairs, and presenters. In addition, we publish both in-house and external papers as a result of our research and information programs.

This fiscal year, there were some notable events involving environmental and public health concerns that prompted the press and community groups to seek scientific opinions and comments from FIPR, which were seen in newspaper articles and television segments. Examples of the Institute's technology transfer activities are summarized below.

Presentations and Publications

FIPR Publication No. 02-191-256. Pilot Plant Demonstration of Sand-Clay-Overburden Mix for Accelerated Reclamation. MetPro Supply, Inc. in collaboration with University of Florida and Phosphate Beneficiation, LLC.

Birky, B. Town Hall Meeting, Lakeland. Presentation to the Grasslands and Oakbridge Communities. Radiation and mined lands. June 6, 2017.

Birky, B. Recent NORM Events in Florida. Presentation to the Florida Radiation Advisory Committee, Tampa. May 23, 2017.

Birky, B. Breaking News: Radiation Everywhere. Presentation to the Manatee County Citizens Advisory Panel. April 27, 2017.

Birky, B. "Phosphate 101" Presentation to Leadership Polk. January 26, 2017.

Birky, B. New Options for (Old) Residuals: Setting the Stage. IFA Global Safety Summit, Amman, Jordan. March 29, 2017.

Birky, B. Session III Chair. IFA Global Safety Summit, Amman, Jordan. March 29, 2017.

Hilton, J., Birky, B., Andresen, V., and Moussaid, M. Updates…New Delhi 2016, IFA PG Report, Policy and Regulatory Trends. IFA Global Safety Summit, Amman, Jordan. March 27-30, 2017.

Birky, B. NORM and Risk. IFA Global Safety Summit, Amman, Jordan. March 27, 2017.

Birky, B. and Hilton, J. Co-convenors. NORM / PG Working Group Meeting. March 27, 2017.

Chih-Hsiang Chien, Alex Theodore, Chang-Yu Wu, Yu-Mei Hsu, and Brian Birky. “Development of a Thoracic Personal Sampler System for Co-Sampling of Sulfuric Acid Mist and Sulfur Dioxide Gas.” 2016 American Association for Aerosol Research (AAAR) Conference. Portland, OR. October 17-21, 2016.

Chih-Hsiang Chien, Alexandros Theodore, Chufan Zhou, Chang-Yu Wu, Yu-Mei Hsu & Brian Birky (2017): Development of a Thoracic Personal Sampler System for Co-Sampling of Sulfuric Acid Mist and Sulfur Dioxide Gas, Journal of Occupational and Environmental Hygiene, DOI: 10.1080/15459624.2017.1303575

Chih-Hsiang Chien, Alexandros Theodore, Chang-Yu Wu, Yu-Mei Hsu, Brian Birky. Upon correlating diameters measured by optical particle counters and aerodynamic particle sizers. Journal of Aerosol Science, Volume 101, November 2016, Pages 77-85. https://doi.org/10.1016/j.jaerosci.2016.05.011

Patrick Zhang, et al., editors, July 2016 Beneficiation of Phosphates: Comprehensive Extraction, Technology Innovations, Advanced Reagents.

Zhang, P., et al., “Rare Earths Recovery and Gypsum Upgrade from Florida Phosphogypsum,” invited paper by the Minerals & Metallurgical Processing journal for 2017 publication.

Zhang, P., et al., “The Ultimate Mineral Processing Challenge: Recovery of Rare Earths, Phosphorus and Uranium from Florida Phosphatic Clay,” invited paper by the Minerals & Metallurgical Processing journal for 2017 publication.

Zhang, P., et al., 2017, “Rare-earth leaching from Florida phosphate rock in wet-process phosphoric acid production,” Minerals & Metallurgical Processing journal, Vol. 34, No. 3, pp. 1-8.

Zhang, P. Organized the CMI 2017 Workshop on Rare Earths and Uranium in Phosphate, Bartow, Florida, January 18, 2017.

Zhang, P. Serving as conference chair, started preparation for Beneficiation of Phosphate VIII to be conducted in Cape Town, South Africa, May 2018.

Zhang, P. Involved in organization, as the Technical Chair, of the 1st International Conference on Sustainable Development of Phosphate Resources, June 16-19, 2017, Yichang, China.

Zhang, P. Wrote the Phosphate chapter for the updated SME Mineral Processing and Extractive Metallurgy Handbook.

Zhang, P. “Rare Earths Occurrence in Florida Phosphate Ore and their Fate during Mining and Processing,” presented at Rare Earths 2016, June 5-10, 2016, Sapporo, Hokkaido, Japan.

Zhang, P. “Beneficiation and Leaching of Phosphate Process Streams for REE Recovery,” presented at The 8th International Conference on Rare Earth Development and Application, Aug. 2-6, 2016, Lanzhou, China.

Zhang, P. “Beneficiation and Leaching Techniques for Uranium Recovery from Phosphate Processing Streams,” presented at the IAEA Technical Meeting of the Uranium Mining and Remediation Exchange Group, September 26-29, 2018, Grand Junction, CO.

Zhang, P. “Reclaiming Phosphorus, Critical Elements and Uranium from Florida Phosphate Mineral Processing Tailings”, presented at Phosphates 2017, March 13-15, 2017, Tampa, FL.

Richardson, S.G. Natalgrass Control. Central Florida Invasive Species Management Workshop. April 19, 2017.

Albarelli, G, Lloyd, M. and Wojak, B. Sulphur Assisted Carbon Capture and Utilisation. Sulphur. July-August 2016.

Sukhraj, I. Implementing Generation-STEM* Classrooms, Presented at the Texas Instruments Leadership Summit, Tampa, FL, May 2017.

Press

Birky, B. Quoted in “Phosphate Scientist: Radiation is Zero”. Suzie Schottelkotte, Lakeland Ledger. June 7, 2017.

Birky, B. Wingate East Expansion and New Wales Sinkhole. Interview with Tony Pugh: Bradenton Herald via Washington, D.C. November 2016.

Birky, B. The JDC Kiln Process. Interview with Stephanie Claytor of Bay News 9. November 9, 2016.

Birky, B. Phosphate Operations in Florida. Interview with ABC Action News Tampa. November 3, 2016.

Birky, B. EPA Phosphate Industry Investigation in 2011. Richard Pollock, Senior Investigative Reporter, The Daily Caller News Foundation in Washington, DC. October 28, 2016.

Birky, B. Overview of the Phosphate Industry Worldwide. Farook Singh, Independent Producer affiliated with BBC, National Geographic and PBS. August 11, 2016.

Birky, B. Elevated Radioactivity in Some of the Wells Tested Near New Wales. Ryan Raiche with ABC Action News Tampa, WTFS. October 25, 2016.

Birky, B. Interpretation of Well Water Analyses. Aired TV with Shannon Behnken of "Better Call Behnken" on Channel 8. October 18, 2016.

Birky, B. "Mosaic to start sealing New Wales sinkhole by December" by Kevin Bouffard, Lakeland Ledger. October 18, 2016.

Birky, B. Personal Profile as an Industry Expert. Interview with Michael Lawton from Germany. October 13, 2016.

Birky, B. Natural Radioactivity in Water. On camera interview with Rick Elmhorst, anchor/reporter with Bay News 9, Tampa. October 12, 2016.

Birky, B. Story on JDC Phosphate's Technology in Sunday's Business Section. Kevin Bouffard, Lakeland Ledger. October 9, 2016.

Birky, B. Mosaic Phosphogypsum Stack Sinkhole and Water. Jesse Newman, Wall Street Journal, September 28, 2016.

Birky, B. Mosaic sinkhole. Kevin Bouffard, Lakeland Ledger. September 16, 2016.

Birky, B. "Digging in: Phosphate producer Mosaic is in it for the long haul" by Jerome Stockfisch, Tampa Bay Times. September 2, 2016 publication based on August 23 interview.

Birky, B. On New Manager, Walter Precourt, of Mosaic and the Future of Mining and Processing in Florida. Kevin Bouffard, Lakeland Ledger. August 24, 2016.

Richardson, S. USF Radio, Florida Matters: The Phosphate Industry. This was a panel discussion on the impact of the phosphate industry on Florida. Taped April 7, 2017; broadcast April 11.

Course and Conference Collaboration with Florida Polytechnic University

Participated in Florida Energy Systems Consortium (FESC) grant for Renewable Energy and Sustainability Course, Florida Polytechnic University, Fall 2016.

Sponsored Florida Academy of Sciences 81st Annual Conference at Florida Polytechnic University, March 10, 2017.

Research

FIPR Institute research projects are either conducted in-house or by various universities and private companies using Institute funds. FIPR Institute Research Directors serve as Contract Managers for all projects. Projects that were completed or ongoing during the fiscal year are described in the following text.

The Institute's Strategic Plan, available on our web site, covers the period 2011 through 2016, but has been indefinitely extended in an effort to coordinate with the University's Strategic Plan, which is still in development. The FIPR Institute's Strategic Plan discusses goals and approaches to achieve them in each of the Institute's research and programmatic areas. Unsolicited proposals that address these goals are encouraged.

The Institute's projects that are funded by the Phosphate Research Trust Fund are directed at solving real-world problems identified with the mining and processing of phosphate rock in Florida in which the public has a substantial interest. Summaries of the Institute's research are described by title, funded organization, and a brief description of the objectives and accomplishments.

Recovery of Rare Earths and Uranium from Phosphate
FIPR Institute and the Critical Materials Institute

In early 2013, the US Department of Energy (DOE) awarded $120 million to the Critical Materials Institute (CMI) to establish a new Energy Innovation Hub. CMI focuses on developing and commercializing advanced technologies to secure the national supply for critical materials, particularly rare earth elements (REE). The FIPR Institute is undertaking the project on recovery of U and REE from phosphate mining and processing products as well as byproducts. All CMI members are shown in the figure below.

CMI member universities, national laboratories, and industry partners.

The FIPR Institute has hosted four annual workshops that reviewed progress of all member teams researching the recovery of REE and uranium from phosphate rock. There were 10 phosphate process streams characterized so that now the REE content, distribution and available forms are known. Beneficiation technologies to concentrate the REE have been developed for each of the six phosphate process streams. The FIPR Institute collaborates with other CMI member institutions and affiliates. ORNL research involving University of Tennessee students, and ThorOre in collaboration with University of Central Florida students, were hosted at the FIPR Institute laboratory facilities.

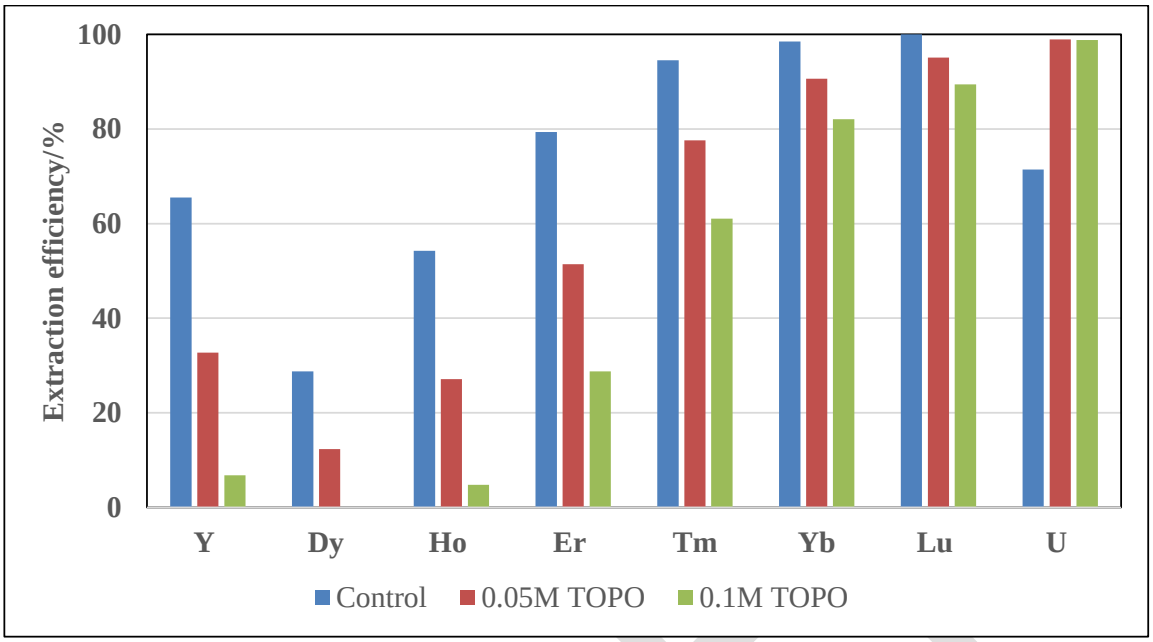
The major FIPR achievements under the CMI project are summarized as follows:

- gained a better understanding of rare earths occurrence in phosphate rock, phosphate flotation tailings, phosphogypsum (PG), acid sludge, and phosphoric acid, thus being able to develop suitable beneficiation and extraction schemes for each stream;
- conducted two in-plant pilot testing campaigns to concentrate REE minerals from waste clay and amine flotation tailings, with shaking table testing achieving roughly 50% REE concentration in about 6% of the total mass of flotation tailings;
- developed a multi-stage leaching scheme for recovering REE from PG using dilute sulfuric acid without infringing on the regulatory conditions of PG; and
- discovered a significant REE source material: sludge from phosphoric acid concentration/clarification.

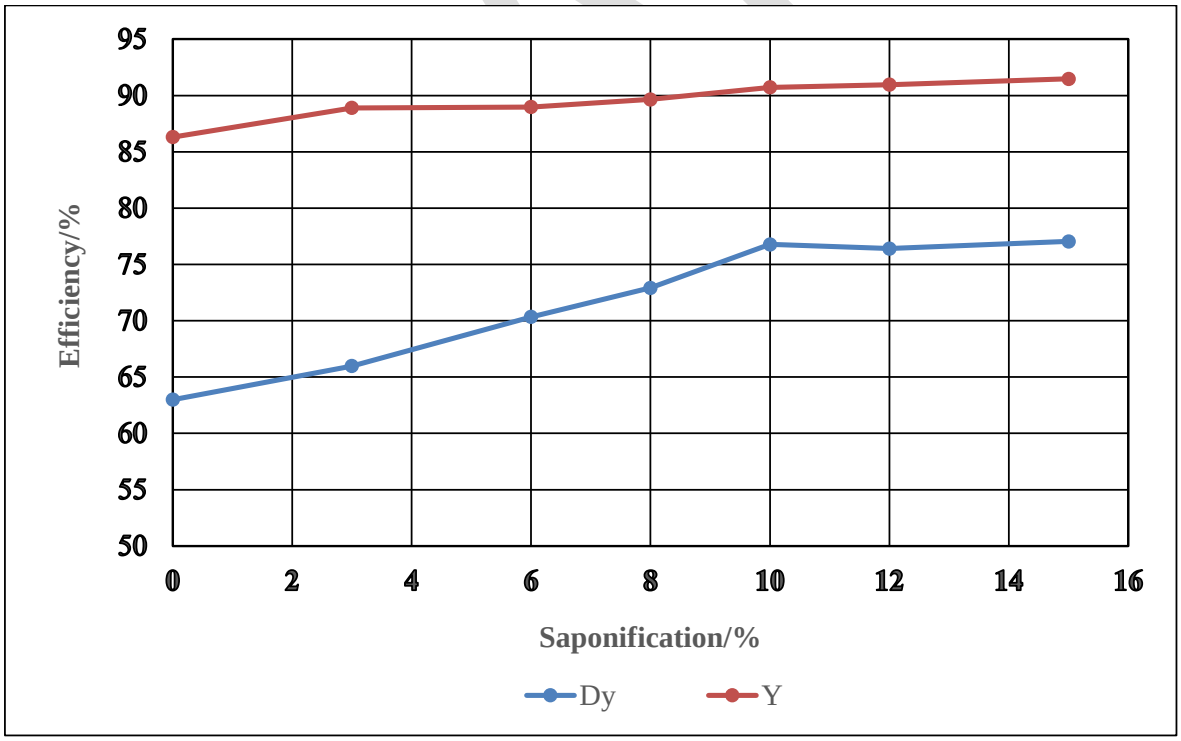
Recent achievements include:

- an extraction process was developed for simultaneous recovery of heavy rare earths and uranium from phosphoric acid;
- a processing scheme was designed for producing high-value phosphoric acid and heavy rare earths-containing solids from phosphoric acid sludge;
- a laboratory, continuous testing system consisting of gravity separation and flotation was designed for long-term investigation on recovery of rare earths, phosphorus and uranium from phosphatic clay; and
- four (4) peer reviewed journal papers were prepared and accepted for publication.

Participants of a Focused 2017 CMI Workshop on Down-Selecting Processing Flowsheets for REE Recovery from Phosphate Processing Streams.



Extraction Efficiencies of REEs and U from WPA with Mixture of 1.0M D2EHPA and TOPO.



Effect of Saponification of D2EHPA on Dy and Y Recovery from WPA Solution.

Pilot Plant Demonstration of Sand-Clay-Overburden Mix for Accelerated Reclamation

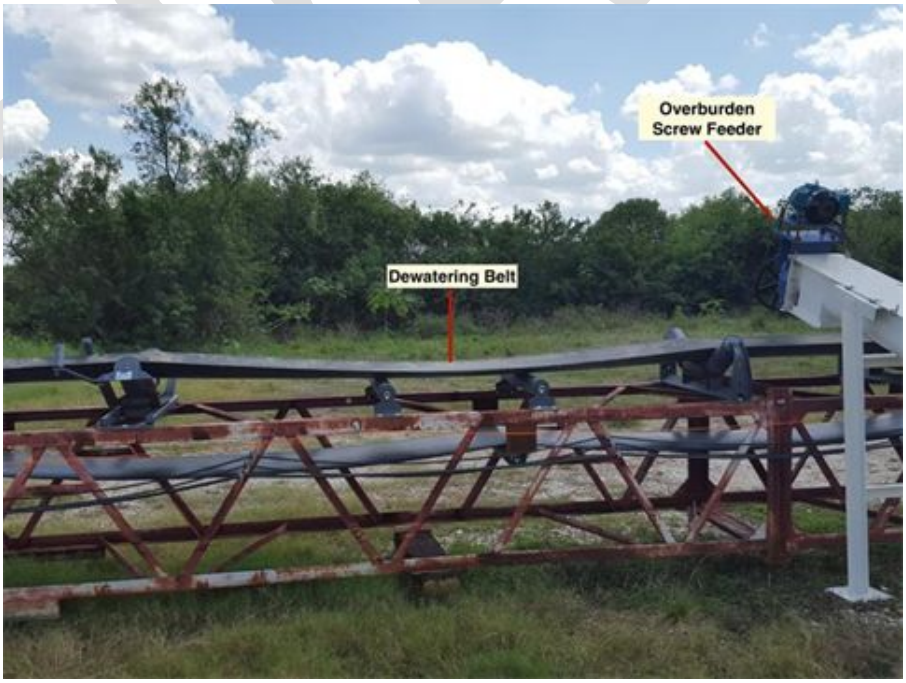
MetPro Supply, Inc.

This project investigates the incorporation of overburden with the sand-clay mix; adding a new component (the overburden) to a previously tested method of accelerated reclamation. The following steps achieve almost instantaneous reclamation:

1. use a flocculation/thickening process for waste clay to achieve 15-20% solids;
2. mix the flocculated clay with sand to obtain a product containing 20-35% solids;
3. add additional sand to get percent solids in the mixture to as much as 50%; and
4. mix overburden with sand-clay to achieve >60% solids for reclamation of mine cuts.

The project was successfully completed and results exceeded expectations (FIPR Publication No. 02-191-256). The long-term, pilot scale demonstration showed that the mixture of tailings sand and clay could be dewatered to 50% solids or more in minutes. The solids content of the mixture of overburden, sand, and clay discharged from the pilot plant averaged 67% solids. Further dewatering of the pilot plant product to 80% solids was achieved by placing the mixture in an unlined trench for 10 days. From the technological point of view, it is a phenomenal accomplishment to produce flocs of sand-clay mix that can keep their integrity after going through hydrocyclone, screen and screw classifier.

Cyclone Underflow Discharge.



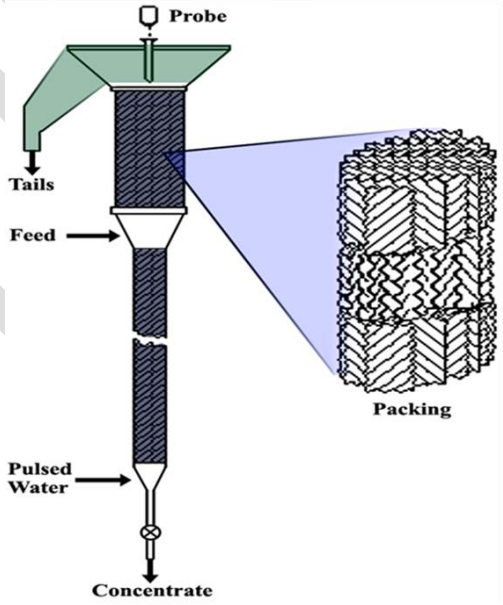
Overburden Screw Feeder and Dewatering Belt.

Removal of Dolomite from Florida Phosphate Pebble Using Packed Column Jig

Mineral Technologies International

The project was approved during the fiscal year and is in contract negotiations. It is designed to conduct continuous, pilot-scale testing of gravity separation using a packed column jig (PCJ) for separating dolomite from phosphate, thus allowing the use of large amounts of high-dolomite phosphate pebbles currently stockpiled or left in the ground. Dolomite, a natural contaminant in Florida phosphate rock, is a huge problem for fertilizer processing. The lower zone Hawthorne Formation being currently mined commonly has high MgO contamination. There are existing techniques for dolomite removal from phosphate rock, including: flotation, chemical treatment, and high-temperature treatment. All of these methods have some associated environmental issues.

The working principle of PCJ is demonstrated in the figure below. PCJ is a column filled with packing plates which are corrugated diagonally and set in an alternating configuration. The packing plates create a myriad of small cells in the column. A stream of mixed particles is fed through an inlet located near the top of the column. The feed point depends on the feed characteristics and concentrate grade target. A steady state water flow enters the bottom of the column and a pulsating flow is also superimposed to create a jigging action that maintains all particles in suspension limiting stagnation problems. The unique features of PCJ can be summarized as follows: 1) low energy use, 2) long, nearly unlimited separation zone, 3) small footprint, 4) minimal water use, 5) no chemicals used, 6) high throughput, and 7) effective for both coarse and fine particles.



Components of the Packed Column Jig.

Novel Technologies to Convert Dolomite Phosphate Rock into High Efficiency Slow Release Fertilizers

University of Florida

High dolomite phosphate rock is a worldwide problem in phosphate processing, and it is becoming more and more critical to the Florida phosphate industry. The wet process for phosphoric acid manufacturing is still the predominant technology for phosphate fertilizer production. This process generally requires a phosphate rock feed containing less than 1% MgO.

As the phosphate mining in central Florida moves farther south into the lower zone, the grade of the ore (matrix) gradually decreases, with dolomite being the major undesirable component. The flotation feed from the lower zone can generally be processed using the Crago double flotation process, but the pebble fraction averages 6% MgO and is currently stockpiled. The industry is estimated to generate close to one million tons of such high-dolomite pebbles per year. Other high dolomite phosphatic materials include waste clay and the oversize rejects from the washer. Finding beneficial uses for these dolomitic phosphate materials not only improves phosphate resource utilization efficiency dramatically, but also greatly reduces the environmental impacts of phosphate mining.

Recently, progress has been made in converting low grade phosphate rock into high efficiency, slow release P fertilizers by subjecting fine phosphate rock (PR) powder to reactions with some types of organic compounds called phosphate-activating agents. As a result, the surface of PR particles is covered with organic molecules, which markedly increase surface exposure to soil matrix and enhance physical, chemical, and biological reactions on the surface of PR. This two-year project includes 6 major tasks: 1) screening of activation agents to find the most effective; 2) optimization of the activation parameters; 3) physical and chemical characterization of the activated phosphate fertilizer; 4) greenhouse experiments to compare the new fertilizer with traditional phosphate fertilizers; 5) column leaching study to assess the environmental impact of the slow release fertilizer; and 6) economic analysis.

In the recently submitted project annual report, the research team presented the following encouraging findings:

- activation with selected organic molecules significantly increased water soluble P (WSP) in the dolomite phosphate rocks (DPRs), from ~5-15 to ~100-6000 mg/kg, varying largely among the different activating agents or their combination, and between the DPR samples;
    - organic molecules were coded as HA, LSS, and CA;

    - based on WSP, the activating efficiency decreased in the order of HA > LSS > HA+CA > LSS+CA > LS >CA,
    - both HA and LSS are effective in activating DPR, enhancing P release from DPR by 300-700 times, but HA is overall superior to LSS;
- based on sequential extractions, supply of P from HA- or LSS-activated DPRs is of slow release characteristics with 30-60% released in the first extraction, as compared to >85% from soluble phosphate;
- quantitative XRD analysis indicated that the activation process significantly increased the ratio of apatite/dolomite, which could be attributed to partial dissolution of dolomite by the organic agents, and thus promoted release of P from DPRs;
- the results from the optimization study based on one rock sample indicate that the optimized activation conditions are:
    - particle size < 100 mesh, 8% dosage of activating agent, reaction for 20 min, and at 20% moisture;
    - under optimized conditions, activation with humic acid can raise water soluble P from 9.4 mg/kg to 8790 mg/kg, as estimated by one-time extraction; and
- activation processes enhanced release of Ca and Mg from DPR, but had minimal influence on water solubility of trace metals including Fe, Mn, Cu, Zn, Cr, Cd, Pb and Ni.

Development and Demonstration of X-Ray Tomography for Plant-Site Characterization of Pebble Phosphate

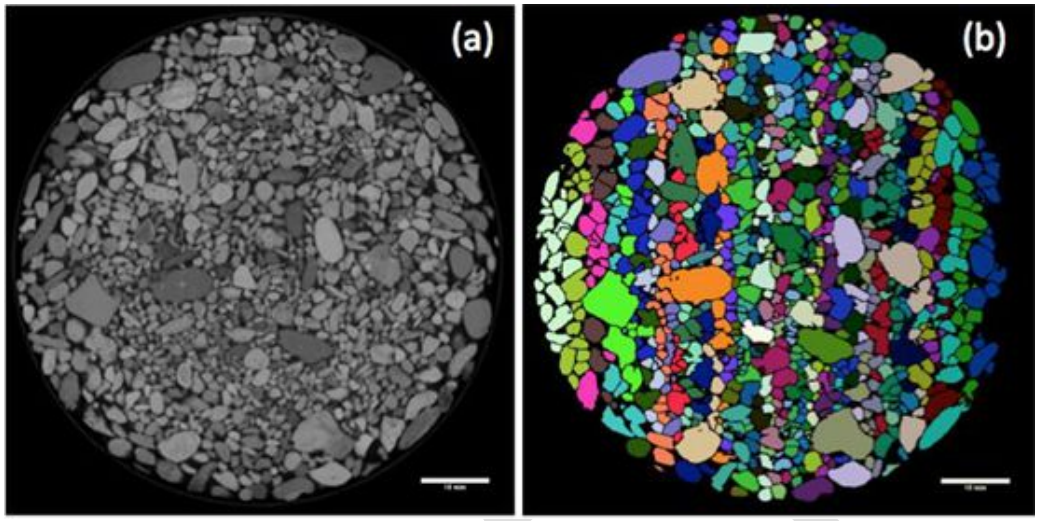
University of Utah

The central Florida phosphate industry has moved into the lower grade ore bodies from the Southern Extension, the lower zone of which is highly contaminated by dolomite, with the dolomitic pebbles being the major problem. Dolomite, or MgO, content is a major quality control indicator for the phosphate pebble product. Except for limited use of a laser based analyzer, current practices require either stockpiling of pebble product until quality control data from sampling become available, or making the shipping or discarding decision based on visual observations of rock as it is being produced. Therefore, instantaneous determination of MgO is of practical importance for better quality control. When flotation of dolomitic phosphate becomes necessary for removing the dolomite, on-line analysis of dolomite will become even more critical. This project is designed to develop a rapid analytical instrument method for quantifying phosphate rock composition on a moving belt, in a storage bin, or in a flotation cell, with the primary objective of determining dolomite (MgO) content. The method is based on X-ray tomography.

Samples of high and low MgO pebble phosphate from Mosaic's Four Corners operation and high MgO pebble phosphate from their South Pasture operation were collected, prepared, and shipped for high-speed X-ray computed tomography (HSXCT) analysis. Appropriate operating conditions for the HSXCT scanning of pebble phosphate have been established. Samples have been scanned and procedures for analysis established. Pebble phosphate samples of various amounts have been scanned in containers of different size to determine the maximum amount of sample that can be examined and still capture a high quality 3D image with and without beam hardening corrections. Finally, replicate (duplicate) samples were scanned in order to establish reproducibility and the statistical significance associated with sampling and scanning.

Scanning of pebble phosphate products has been demonstrated to be possible at a sampling rate of 0.4 - 0.6 kg/min using HSXCT with the automated VoluMax system available from ZEISS at an approximate cost of $850,000. The HSXCT data provides mineralogical and liberation analyses of dolomite and francolite with good reproducibility and good correspondence to chemical analysis. Although beyond the scope of this research project, the HSXCT data will allow the determination of the size and shape of the pebble phosphate particles. For about 1 kg of sample, the analysis time for mineral content is expected to be about 5 minutes and for mineral liberation about 15 minutes. These times can be reduced significantly if a high performance computer system is used.

ZEISS VoluMax 800 CT Machine for High-speed X-Ray Tomography.



CT Images: (a) 2D HSXCT and (b) Watershed Segmented Images of a High Dolomite Phosphate Pebble (No Beam Hardening Correction).

Leaching Study for Select Process and Non-Process Waters Relative to Future Disposal through a Deep Injection Well

Ardaman & Associates, Inc.

The current practice of pond water treatment and subsequent surface discharge is not only expensive, but also consumes a tremendous amount of fresh water. In the current pond water treatment and surface discharge practice, at least 5000 gallons of fresh water are used as dilution water for every 1000 gallons of process water treated to meet the requirement for conductivity. A typical PG stack system closure could require the treatment of over 3 billion gallons of process water, consuming 15 billion gallons of fresh water.

The Ardaman & Associates project is designed to study the feasibility of deep well injection of treated/partially treated water as an alternative to surface water discharge for phosphogypsum stack closure. The scope of work involves the following major components:

- characterizing 8 water sources for 21 water quality parameters;
- conducting various treatment tests on the waters;
- modeling the behavior of treated or partially treated water in various carbonate cores;
- performing leaching tests to determine carbonate core integrity with time in various waters; and
- analyzing all test data to provide guidelines for implementing the deep well injection method.

Treatment of Chemical Processing Pond Water and Precipitation of Phosphorus Using Nclear

Nclear, Inc.

Currently, the primary strategy for treating process wastewater is double liming, which requires raising the wastewater to pH 11 in two steps, stripping the water of undissociated NH_3, and reducing the pH back to ~ 6.5 by adding acid.
Nclear is a synthetic calcium (Ca) silicate mineral that induces and enhances phosphorus removal from water and wastewater. It requires lower pH for P removal than that required for double liming. Large scale tests showed that Nclear was more effective than alum or ferric salts for P removal.

The primary objective of the proposed work is to evaluate the efficacy and cost for phosphorus (P) removal from chemical processing pond water. Another advantage of using Nclear is better compaction ability of the sludge product.

Another potential application of Nclear is for phosphorus removal from flotation process water in the future when dolomite flotation is commercialized in Florida. FIPR has in development a flotation process for processing the high-dolomite phosphate pebbles. In this process, sulfuric acid must be used to adjust the slurry pH to about 5. This acid is also necessary for depressing phosphate to improve selectivity. The mild dissolution of phosphate rock at pH 5 results in high phosphorus content in the flotation process water. Studies showed that phosphorus content in the flotation process water averages about 100 ppm. When it is the time to shut down the mine, the phosphorus-containing process water must be treated for discharge, which could be very expensive. Water treatment using Nclear could reduce that cost.

Screening of a New Candidate Biological Control Agent of Brazilian Peppertree

University of Florida

Brazilian peppertree (*Schinus terebinthifolius*) is a non-native, highly invasive shrub or small tree that infests thousands of acres of mined and unmined lands in Florida. The plant is not invasive in its native habitat in South America, indicating that its aggressive spread in Florida and elsewhere may be due to escape from its natural enemies. This suggests that importing Brazilian peppertree's natural enemies, such as certain insects, may help control the plant. The research has been testing the performance of two species of a leaf-gall-forming psyllid insect (*Calophya latiforceps and C. terebinthifolii*) on injuring Brazilian peppertree, testing the host specificity of the insect (attacking the target plant species, but not harming other plant species), and developing methods for rearing the insects. This is information needed before the insect can be considered for release in Florida.

Two insects have been and are being screened as possible biological control agents. Insects have been imported to quarantine labs both in Florida and in Brazil, and researchers have been working to rear them and assess their control performance and host specificity for Brazilian peppertrees.

Progress of the research project includes:

- a petition has been submitted to the USDA Animal and Plant Health Inspection Service (APHIS) requesting field release of *Calophya latiforceps* as a biological control agent on Brazilian peppertree;
- the USDA Technical Advisory Group recommended approval for release;
- continued research on *Calophya terebinthifolii* and a new *Calophya* species;
- populations of *Calophya* species are being maintained at Fort Pierce for continued research and possible release.

Uncontrolled Brazilian Peppertree.

Potential Biological Control of Cogongrass with the Indonesian Gall Midge, Orseolia javanica

University of Florida

Cogongrass (*Imperata cylindrica*) is a non-native and highly invasive rhizomatous grass that has infested thousands of acres of mined and non-mined lands in Florida. A gall midge insect (*Orseolia javanica*) has been discovered in Indonesia that attacks Indonesian strains of cogongrass. It is believed that the Florida strains of cogongrass may be genetically similar to the Indonesian strains and thus may be susceptible to attack by the Indonesian gall midge. A preliminary project was funded to determine if the Indonesian gall midge would be able to complete its life cycle on Florida cogongrass and inflict damage to the grass. In the project, cogongrass rhizomes have been collected from northern and central Florida; permits have been obtained; and the rhizomes have been shipped to Indonesia for testing.

Cogongrass Infestation on Former Mined Land

Establishment and Management of Vegetation Cover on Phosphogypsum Stacks
FIPR Institute

The initial research was conducted 1989-2004. Current efforts include training of new industry personnel and consultants/contractors on the principles and methodology for establishing and managing vegetation cover on the side slopes of phosphogypsum stacks, plus evaluating and testing the effectiveness of additional techniques.

Grass Established on a Phosphogypsum Stack.

The FIPR Institute's reclamation department has conducted extensive research on this topic. Mosaic asked for FIPR's assistance in providing training on earlier findings and in conducting further tests on potentially more cost-effective methods for pH adjustment and grass establishment on closed phosphogypsum stack side slopes. The FIPR Institute has conducted a training workshop for industry consultants. Field tests are being performed

on experimental methods of establishment and management of grass cover on closed stacks, to include the use of bermudagrass sod or hydroseeding and mulch applications.

Preliminary findings and/or recommendations include:

- do it right the first time (it is expensive to rework grass establishment areas);
- allow time for rainfall on the stack and subsurface drains to reduce the salinity and acidity before planting (this reduces the amount of lime that must be applied for pH balancing);
- if sod is to be used directly on phosphogypsum, it must be at least 95% bermudagrass (a grass species tolerant to acid and salt);
- mowing of grassed areas (primarily for weed control) should be reduced in frequency and mowing height should be increased (grass cover can be damaged by tractor tires sliding, even slightly, downslope and by mowing itself, particularly when the mower hits a high spot in the gypsum).

On-going work includes comparison of the cost-effectiveness of seeding techniques versus sod application.

Prior to the current work it was thought that, in general, if you roughen the surface of the phosphogypsum (through ripping or plowing on the contour), runoff would be decreased and more water from rainfall would be allowed to infiltrate into the stack and lead to more leaching (in combination with subsurface drains). Results are thus far inconclusive, so it may not be necessary to roughen the surface. We have observed pH increases from less than two to about four without any surface roughening by just letting the stack sit long enough. Good leaching occurs within the first year of stack closure, so waiting one year is adequate to bring the pH to 4 or slightly above and reduce the amount of lime required for good grass cover establishment. Tillage, however, is required to loosen the phosphogypsum surface prior to planting.

There are some new techniques being tried in the recent research, including the use of better quality sod of tolerant grass, allowing natural leaching to raise pH and reduce lime application, and testing potentially more effective hydro-seeding and hydro-mulching methods. The tests are on-going.

Native Wildflower and Grass Establishment

FIPR Institute and Florida Wildflower Foundation

This ongoing research project is a cooperative effort of the FIPR Institute, the Florida Department of Environmental Protection (FDEP), and the Florida Fish and Wildlife Conservation Commission (FWC) in addition to the grant funds from the Florida

Wildflower Foundation. The project focuses on the establishment of native wildflowers and grasses on disturbed lands (including mined and non-mined lands) and the control of invasive, competitive weeds.

Most of the weed seeds occur in the uppermost layer of soil. Soil inversion, using a moldboard plow, is being tested as a way to bury the weed seeds and thus prevent or inhibit weed seed germination, compared to shallow tillage by disking. The moldboard plow treatment showed some success, but the soil inversion achieved was sometimes incomplete, especially when plowing through sod. Research staff members and cooperators are currently in search of a deeper plow that would create more complete soil inversion.

The application of pre-emergent herbicides immediately after planting of small container-grown plants was found to be effective for preventing broadleaf and grass weed seed germination, reducing weed competition, and promoting good plant establishment and growth. At two of the study sites on former mined lands, either not treated with pre-emergent herbicides or after the pre-emergent effect had worn-off, the weeds were predominantly broadleaved plants. Where grasses had been planted, application of a selective post-emergent (applied to the leaves) broadleaf herbicide, which did not injure the grasses, resulted in reduced weed competition and good grass establishment and growth. Unfortunately, we don't yet have a post-emergent herbicide that could control broadleaf weeds without also severely injuring the planted broadleaved flowers, although it is possible to apply some grass killers without injury to the broadleaved flowers. We are continuing to work on selective control of various weeds with minimal or no injury to desired plants. The work includes control of very difficult perennial weeds as well as weeds from seeds.

Establishment of Native Plants on Impacted Lands.

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Please contact us for more information on the research or programs of the FIPR Institute.