

FIU-DOE Mid-Year Review 2014

Monday, Feb 24 th	Tuesday, Feb 25 th	Wednesday, Feb 26 th	Thursday, Feb 27 th	Friday, Feb 28 th
<p>10:00 A.M. – 11:00 A.M. <i>Presentation - D&D and Environmental Management IT Research (FIU Project 4)</i></p> <p>11:00 A.M. – 12:00 P.M. <i>Discussion of research area in support of EM</i></p>	<p>1:00 P.M. - 2:00 P.M. <i>Presentation - High Level Waste/Waste Processing Research (FIU Project 1)</i></p> <p>2:00 P.M. - 3:00 P.M. <i>Discussion of research area in support of EM</i></p>	<p>2:00 P.M. - 3:00 P.M. <i>Presentation - Workforce Development and Training (FIU Project 5)</i></p> <p>3:00 P.M. - 4:00 P.M. <i>Discussion of research area in support of EM</i></p>	<p>10:00 A.M. - 11:00 A.M. <i>Presentation - Soil & Groundwater Research – Oak Ridge (FIU Project 3)</i></p> <p>11:00 A.M. - 12:00 P.M. <i>Discussion of research area in support of EM</i></p> <p>2:00 P.M. - 3:00 P.M. <i>Presentation - Soil & Groundwater Research – Hanford (FIU Project 2)</i></p> <p>3:00 P.M. - 4:00 P.M. <i>Presentation - Soil & Groundwater Research – SRS (FIU Project 2)</i></p>	<p>10:00 P.M. - 12:00 P.M. <i>Wrap-up: Discussion of DOE-FIU Cooperative Agreement</i></p>





Applied Research Center
FLORIDA INTERNATIONAL UNIVERSITY

FIU-ARC STEM Workforce Development Program

Dr. Leonel Lagos, PhD, PMP®
Director of Research
Principal Investigator

Florida International University
Applied Research Center

*Worlds
Ahead*



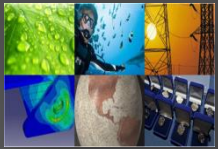
Project Staff and Students

Program Director: Leonel Lagos, PhD, PMP[®]

Faculty/Staff: Peggy Shoffner, Angelique Lawrence, Walter Quintero, David Roelant, Justin Phillips

DOE Fellows

Project 1



DOE Fellow	Program	Project-Subtask	Project Title
Adam Manoussakis	Undergraduate	Project 1-Subtask 2.1	Development of Alternative Unplugging Technologies
Alexandra Fleitas	Undergraduate		
Carmela Vallalta	Undergraduate		
Deanna Moya	Undergraduate	Project 1-subtask 2.4	Computational Simulation and Evolution of HLW Pipeline Plugs
Michael Abbott	Undergraduate	Project 1-Subtask 17.1	Multiple-Relaxation-Time, Lattice Boltzmann Model for High-Density Ratio, Multiphase Flows
Sasha Philius	Undergraduate		
Dayron Chigin	Undergraduate	Project 1 - Subtask 18.1	Evaluation of SLIM for Rapid Measurement of HLW Solids on Tank Bottoms
Gabriela Vazquez	Undergraduate	Project 1 - Subtask 18.2	Development of Inspection Tools for DST Primary Tanks
Jennifer Arniella	Undergraduate		
Ximena Prugue	Undergraduate	Project 1	Continuation of summer internship task for innovative methods to perform dry retrieval of tank waste



Project 2

DOE Fellow	Program	Project-Subtask	Title
Claudia Cardona	Graduate (PhD)	Project 2 - Subtask 1.1	Sequestering Uranium at the Hanford 200 Area by In Situ Subsurface pH Manipulation using Ammonia (NH ₃) Gas Injection
Robert Lapierre	Graduate		
Paola Sepulveda	Graduate	Project 2 - Subtask 1.2	Investigation on Microbial-Meta-Autunite Interactions - Effect of Bicarbonate and Calcium Ions
Joel McGill	Graduate	Project 2 - Subtask 2.1	FIU's support for groundwater remediation at SRS F/H Area
Hansell Gonzalez	Graduate (PhD)		
Valentina Padilla	Graduate	Project 2 - Subtask 2.2	Monitoring of U(VI) bioreduction after ARCADIS demonstration at F-Area
Christian Pino	Undergraduate	Project 2 - Task 2	Remediation research and technical support for Savannah River Site

Project 2

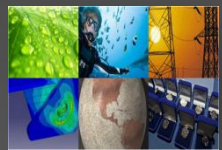


DOE Fellow	Program	Project-Subtask	Thesis
Claudia Cardona	Graduate	Project 2 - Subtask 1.1	The formation and stability of U-bearing precipitates created via in-situ NH ₃ gas injections in the vadose zone
Robert Lapierre	Graduate		Characterization of the Uranium-Bearing Products of Novel Remediation Technologies
Paola Sepulveda	Graduate	Project 2 - Subtask 1.2	Investigating the role of a less uranium tolerant strain, isolated from the Hanford site soil, on uranium interaction in polyphosphate remediation technology
Joel McGill	Graduate	Project 2 - Subtask 2.1	The synergy effect of Si and humic acid on the removal of U(VI)



Project 3

DOE Fellow	Program	Project-Subtask	Title
Natalia Duque	Undergraduate	Project 2 - Task 3	Environmental Remediation Optimization: Cost Savings, Footprint Reductions, and Sustainability Benchmarked on DOE Sites



Project 4

DOE Fellow	Program	Project-Subtask	Title
Michelle Embon	Undergraduate	Project 4 - Task 1	Waste Information Management System (WIMS)
Mariana Evora	Undergraduate	Project 4 - Task 2	D&D Support to DOE EM for Technology Innovation, Development, Evaluation, and Deployment
Mariela Silva	Graduate		
Revathy Ventakaraman	Graduate		
Pedro Cordon	Undergraduate	Project 4 - Task 3	Knowledge Management Information Tool - Application to Deactivation & Decommissioning
Steve Noel	Undergraduate		

DOE Fellow	Program	Project-Subtask	Thesis
Revathy Ventakaraman	Graduate	Project 4 - Task 2	Performance Evaluation of Mobile Applications with Deactivation & Decommissioning (D&D) Technology Services

DOE-FIU Cooperative Agreement



"Working together for a safer and cleaner environment."



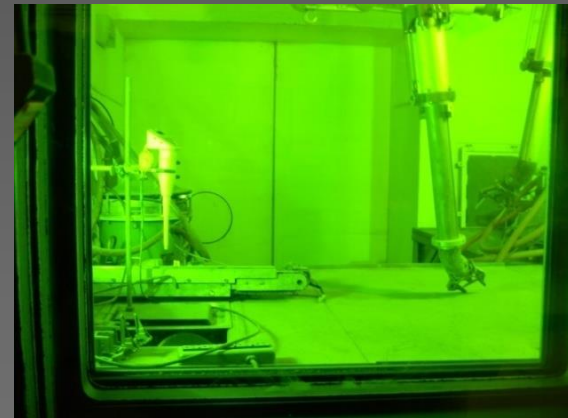
FIU

Applied Research
Center

FLORIDA INTERNATIONAL UNIVERSITY

Dr. Leonel E. Lagos, Principal Investigator

DOE-EM Environmental Restoration

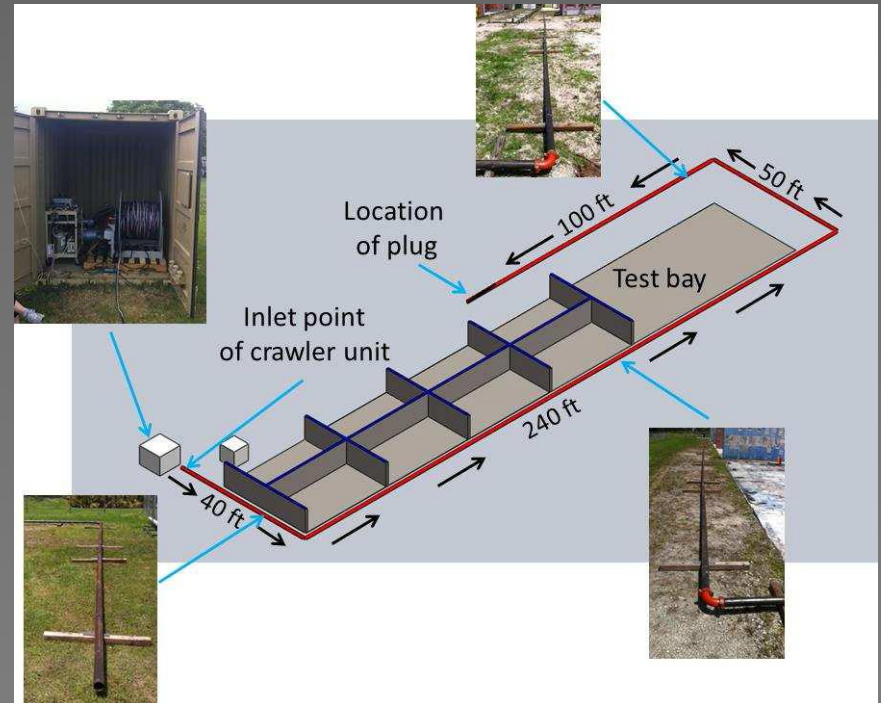




DOE-FIU Cooperative Agreement

- DOE-FIU program established in 1995 as a partnership between Florida International University and DOE's Office of Science & Technology (EM-50).
- Established Technology Evaluation/Demonstration Program for DOE-EM and constructed a Large Scale Technology Demonstration Site at FIU. Over 300 technology evaluation/demonstration and technology development projects were conducted.
- In 2007, the Center established the DOE Fellows Initiative. The program supports approximately 30 students per year being trained and mentored to enter the DOE-EM, DOE national labs, and DOE contractors' workforce (Workforce Development Program).
- The DOE-FIU Program supports project and research efforts at DOE-HQ, DOE sites (Hanford, Savannah River, Oak Ridge, Moab), and DOE national laboratories (ORNL, PNNL, SRNL, Los Alamos).

High Level Waste – Pipeline Unplugging



Soil and Groundwater



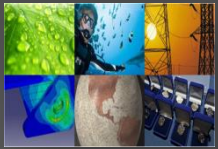
Technology Development & Evaluations



In Situ Decommissioning Sensor Network



Waste Information Management System (WIMS)



Waste Information Management System

Home | Contact Us | Help | Profile | Logout

Welcome Peggy Shoffner to WIMS

Forecast Data | Disposition Map | GIS Map | Transportation | Reports

Welcome to WIMS Waste Information Management System

Receives, organizes, and displays DOE waste forecast data
Automatically generates DOE waste disposition maps
Automatically generates DOE waste pathway GIS maps

WIMS new web address: <http://www.emwims.org>

WIMS is developed to provide DOE Headquarters and site waste managers with the tools necessary to easily visualize, understand, and manage the vast volumes, categories, and problems of forecasted waste streams.

WIMS meets this need by providing a user-friendly online system to gather, organize, and present waste forecast data from DOE sites. This system provides a method for identification of waste forecast volumes, material classes, disposition pathways, and potential choke points and barriers to final disposition.

Disclaimer: Disposition facility information presented is for planning purposes only and does not represent DOE's decisions or commitments. Any selection of disposition facility will be made after technical, economic, and policy considerations. In most cases, data set reflects sites' planning data as of 2Q FY 2012

Have additional questions? [Contact Us](#)

Created by [Florida International University's Applied Research Center](#) for the [U.S. Department of Energy](#)

Waste Information Management System

Home | Contact Us | Help | Profile | Logout

Welcome Peggy Shoffner to WIMS

Forecast Data | Disposition Map | GIS Map | Transportation | Reports

Waste disposed from: All Sites Total Quantities Generate GIS Map
 Base Quantities Print GIS Map
 ARRA Quantities

Waste disposed to: Perma-Fix-Diversified Scientific Services, Inc.

Fiscal Year: From 2013 To 2043 To 2050 Waste Type: All Materials

Waste Disposition GIS Map

U.S. Department of Energy, Office of Environmental Management

Site Name	Waste Volume (m³)
Pacific Northwest Nat Lab	3.36
Idaho National Laboratory	2.49
Argonne National Laboratory	21.32
Stanford Linear Accelerator Center	9.75
Lawrence Livermore National Laboratory	13.15
Lawrence Berkeley National Laboratory	1.69
West Valley Demonstration Project	23.10
Knolls Atomic Power Laboratory	0.70
Kent-Scott	2.80
Brookhaven National Laboratory	19.00
Bettis Atomic Power Laboratory	1.47
Produce Gaseous Diffusion Plant	149.80
Oak Ridge Reservation	602.22
Savannah River Site	57.66

Print GIS Map

<http://www.emwims.org>

D&D Knowledge Management Information Tool



The screenshot shows the D&D KM-IT website. At the top, it features the title "D&D KM-IT" and the subtitle "Deactivation & Decommissioning Knowledge Management Information Tool". A search bar is located on the right. Below the title, there are navigation tabs for "Home", "About", and "Contact", and a "Welcome Guest" message with a "Login" button. A large banner image of a globe is followed by the text "Powered by the Global D&D Community". Below this is a grid of 12 yellow buttons representing various modules: Hotline, Technology, Web Crawler, Mobile System, Lessons Learned, Best Practices, Picture Video Library, Document Library, Specialist Directory, Vendors, Collaboration Tools, and Training. A registration prompt is visible: "Please register to access all of the features of D&D KM-IT." with buttons for "U.S. Registration" and "International Registration". The "Additional Features" section includes a carousel of featured content: "ICM Demo at FIU" (with a "See the video" link), "Search SRS ISSC Reports" (with a "Begin Searching" link), "Prioritization Tool" (with a "Download" link), "D&D Program Map Addendum 2013", "International Reports" (with a "See More" link), and "ITS Inn Tec Sun Rep". A "Quick Links" section at the bottom left contains links to "DOE EM D&D", "SRS ISSC", "ALARA Center", and "EFCOG". A large promotional banner for "D&D KM-IT" is positioned in the bottom left, with the text "Visit Us @ WM14 Booth #733" and "Applied Research Center at D&D KM-IT at Waste Management 2014". To the right of this banner is an "Industry News" section with several news items: "D&D KM-IT at Waste Management 2014", "MPs attack Sellafield decommissioning as costs hit £70bn", "Davis-Besse begins \$600M upgrade", and "Duke Energy submits Crystal River nuclear plant decommission plan to NRC". A "More News" link is provided at the bottom of the news section.

www.dndkm.org

D&D Knowledge Management



Knowledge Management for D&D

- D&D Hotline
- Technology Module
- Vendor Module
- Collaboration tools
- Mobile application for vendor and specialist modules
- Currently:
 - 535 registered users
 - 64 registered subject matter specialists
 - 662 vendors
 - 688 technologies

D&D KM-IT
Knowledge Management Information Tool

Home About Contact Us

Welcome Guest Login

Powered by the Global D&D Community

Hotline	Technology	Web Crawler	Mobile System
Lessons Learned	Best Practices	Picture Video Library	Document Library
Specialist Directory	Vendors	Collaboration Tools	Training

Please register to access all of the features of D&D KM-IT. [U.S. Registration](#) [International Registration](#)

Additional Features

<p>ICM Crawler</p> <p>Demo of Strippable Coatings</p> <p>Read More</p>	<p>D&D Program Map Addendum 2013</p> <p>Read More</p>
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Quick Links DOE EM D&D ALARA Center EPC

D&D KM-IT is now Mobile

You can now use your iPhone, iPad, Blackberry, Android, or Windows smart devices to access the D&D

m.dndkm.org

D&D KM-IT is now mobile

Mobile Features

You can now use your iPhone, iPad, Blackberry, Android, or Windows smart devices to access the Vendors module and Specialist Directory with more modules on the way. You can easily access a specialist or vendor and place a call directly on your phone with our easy to use Mobile System.

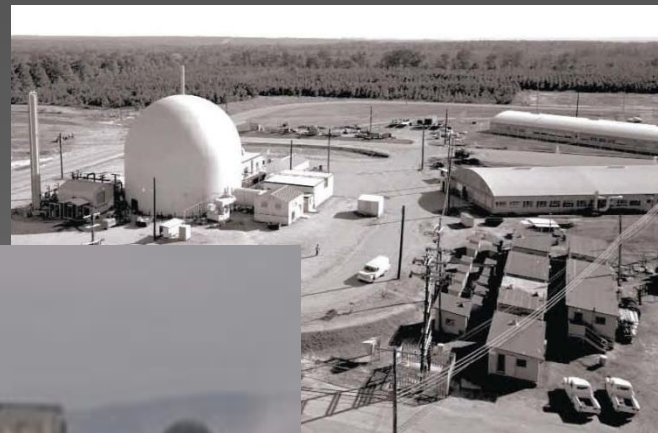
Developed by:
FIU Applied Research Center
FLORIDA INTERNATIONAL UNIVERSITY

In Collaboration with:

m.dndkm.org

Lessons Learned/Best Practices

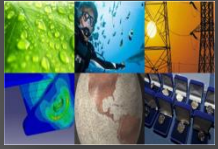
Supporting the Energy Facility Contractors Group (EGCOG) in the development of Lessons Learned and Best Practices. A total of 13 have been developed and 7 have finished the review and approval process and been published on the D&D KM-IT and EFCOG websites.





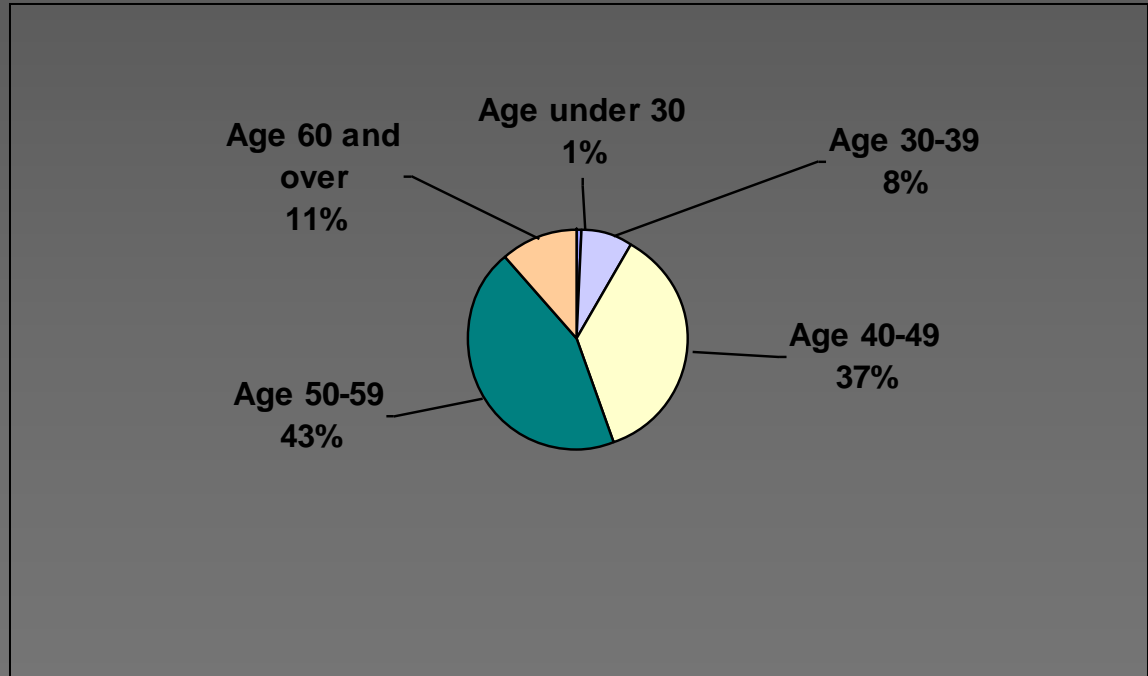
DOE Fellows Program Description

*FIU's Applied Research Center (ARC) is supporting the U.S. Department of Energy's Office of Environmental Management in the training of STEM, minority FIU students in an effort to create of **pipeline** of scientists and engineers that will enter DOE's workforce upon completing their degrees and research at FIU.*



DOE EM Workforce

- Age 40 and above: **91%** of EM's workforce
- Age 30 – 39: **8%** of EM's workforce
- Age 30 and below: **1%** of EM's workforce





Program's Components

- Paid 10-week summer internships at DOE national laboratories, DOE sites, DOE-HQ or DOE contractors, working under the supervision of DOE scientists (mentors).
- Paid 20 hours/week Student Research Assistantship at ARC during school year.
- Research experience with ARC scientists at FIU during school year: one-on-one mentoring performing “hands on” DOE-related applied research.
- Tuition waiver for graduate studies (Master, PhDs).
- 2 to 4 years Developmental Training Program (depends on masters or PhD track).
- DOE Lecture Series and technical seminars.
- Participation in conferences/workshops.



Eligibility Requirements

- United States Citizens/Permanent Resident Aliens
- Minimum 3.0 grade point average
- Two letters of recommendation from faculty members
- Fill out Program's application (fellows.fiu.edu)
- Open to undergraduate (juniors and seniors) and graduate students
- Under-represented minority students



Student Recruitment

- DOE Fellows recruiting other FIU students
- Information Sessions (Spring and Fall semesters)
- In-class presentations for selected STEM discipline courses
- FIU Career and Engagement Office
- Presentations at student societies (ASME, SHEP, SBEP, SWE, etc.)
- DOE Fellows Selection Committee integrated by DOE-EM (HR and Technical), FIU College of Engr., FIU College of Arts & Sciences, and ARC staff



Applied Research Center
FLORIDA INTERNATIONAL UNIVERSITY

A collage of six images representing various scientific and technological fields: a green microscopic view of cells, a person in a lab coat and safety glasses, a power transmission tower, a blue 3D mesh model of a mechanical part, a globe of the Earth, and several blue award plaques.

**DOE-FIU Science & Technology
Workforce Development Program**

Accomplishments

*Worlds
Ahead*

Advancing the research and academic mission of Florida International University.

DOE Fellows Hands on Research at FIU





Major Accomplishments

- **81** internships completed at DOE sites, DOE national labs, DOE-HQ, and DOE contractors
- **18** DOE Fellow internships conducted at Oak Ridge National Lab
- **93** students recruited/inducted as DOE Fellows since program inception in 2007
- **95** presentations (student posters and professional papers) at Waste Management conferences (2008 to 2013), and **6** student presentations at American Nuclear Society conference
- Won Best Professional Poster (Leydi Velez) and 3 Best Student Posters (Denisse Aranda, Danny Carvajal, and Stephen Wood) at Waste Management Conferences 2008-2012
- Many DOE Fellows are also selected to FIU's McNair Fellowship
- **31** Fellows have continued and obtained master and PhD degrees at FIU and conducted their research at ARC or DOE national labs
- 2 DOE Fellows participated in the International Conference for Radioactive Waste Management (ICEM13), students were being fully sponsored by ASME



Major Accomplishments

- **3** DOE Fellows (Rosa Ramirez, Lee Brady, Edgard Espinosa) hired into DOE-EM at DOE-HQ in Washington, DC
- **1** DOE Fellow (Charles Castello) hired at Oak Ridge National Laboratory
- **8** DOE Fellows hired by other federal and state agencies including, Department of Defense (1) , Department of Commerce (1), Department of State (1), Internal Revenue Service (1 Fellow), Department of Health & Humans Services (1), Florida Department of Environmental Protection (1 Fellow), NASA (2 Fellows)
- **3** DOE Fellows hired by DOE contractors – AREVA (1 Fellow), Waste Control Specialists (1 Fellow) , and Bechtel (1 Fellow)
- **Other** DOE Fellows have graduated FIU with bachelors or masters degrees and obtained employment at Boeing Company (3 Fellows), Florida Power & Light (2 Fellows), General Electrics (1 Fellow), Lockheed Martin (1 Fellow), Mount Sinai Medical Center (2 Fellow), Johnson & Johnson (1 Fellow), PriceSmart Inc. (1 Fellow), Bouygues Civil Works Florida (1 Fellow), Crane Aerospace and Electronics (1 Fellow), HP Foundation (1 Fellow), PSI (1 Fellow)

Masters & Ph.Ds



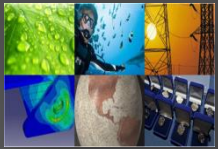
DOE Fellow	Exp. Degree	Major	Topic of Research
Robert Lapierre	M.S.	Chemistry	Uranium sequestration by pH manipulation using NH ₃ gas
Joel McGill	M.S.	Civil engineering	Degradation of Grout: Compressive Strength Comparative Analysis
Valentina Padilla	M.S.	Environmental engineering	Effects of Si and Al concentration ratios on the removal of uranium
Mariela Silva	M.S.	Engineering management	SharePoint based secured collaboration system
Revathy Venkataraman	M.S.	Information technology	Performance analysis of mobile applications accessing web services built using windows communication foundation
Claudia Cardona	Ph.D.	Civil engineering	Evaluating the effects of Si and Al concentration ratios on the removal of uranium
Elicek Delgado-Cepero	M.S.	Electrical engineering	Developing wireless monitoring systems and instrumentation
Heidi Henderson	M.S.	Environmental engineering	Developing water balance model to similar surface water and total suspended solids transport
Janty Ghazi	M.S.	Engineering management	Asynchronous pulsing as a means of unplugging high level waste transfer pipelines
Jose Matos	B.S.	Mechanical engineering	Development of peristaltic crawlers for unplugging of Hanford waste transfer pipelines
Joshua Midence	B.S.	Civil engineering	Saltstone Processing of Low-Level Waste at Savannah River Site
Lillian Marrero	M.S.	Civil engineering	Modeling of mercury and suspended solids
Paola Sepulveda-Medina	M.S.	Biomedical Engineering	Uranium bioremediation
Jaime Mudrich	M.S.	Mechanical engineering	Multiphase simulations with an emphasis on solid-fluid interaction in complex domains

Masters & Ph.Ds



Eric Inclan	M.S.	Mechanical engineering	Asynchronous pulsing method for unplugging high-level waste pipelines
Yulyan Arias	M.S.	Environmental engineering	Sequestering uranium by in situ subsurface pH manipulation using NH ₃ gas
Melissa Sanchez	M.S.	Environmental engineering	Uranium remediation in the vadose zone
Elsa Cabrejo	M.S.	Environmental engineering	Modeling interactions of sediment with mercury
Denny Carvajal	B.S.	Biomedical Engineering	Uranium remediation in the vadose zone
Mario Vargas	B.S.	Mechanical engineering	Development of a remote platform for characterization of nuclear stacks
Amaury Betancourt	M.S.	Environmental engineering	Effects of mercury in anaerobic bacteria
Lee Brady	M.S.	Mechanical engineering	Technologies for unplugging of high-level waste pipelines
Duriem Calderin	M.S.	Biomedical Engineering	Pilot scale experimental design for a wiped film evaporator
Charles Castello	Ph.D.	Electrical engineering	Development of a methyl-mercury analyzer
Melina Idarraga	B.S.	Civil engineering	Quantifying the dissolution of autunite as a function of aqueous bicarbonate.
Rosa Ramirez	M..S.	Biomedical Engineering	Study of mercury speciation in a contaminated watershed
Stephen Wood	M.S.	Mechanical engineering	Investigation of methods for high-level waste pipeline unplugging
Edgar Espinoza	M.S.	Mechanical engineering	Design Optimization of Submerged Jet Nozzle to Enhance Mixing.

Masters & Ph.Ds



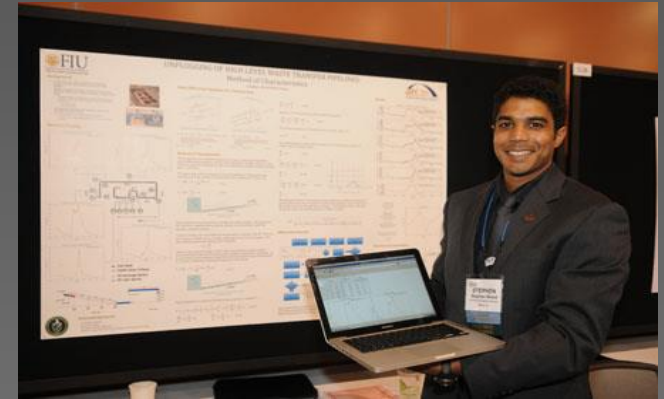
Serkan Akar	M.S.	Biomedical engineering	Developing a Biosensor for Detection of Phosphate Species in Uranium Contaminated Ground Water and Wastewater Sediments by Employing Advanced Biotechnological Methods
Merlin Ngachin	M.S.	Geosciences	Tests and evaluate a new technology, namely SIMWyPES®, by Babcock & Wilcox and used at the Y-12 National Complex at Oak Ridge National Laboratory (ORNL)
William Mendez	M.S.	Engineering Management	Development of a conceptual design of a robotic mechanism. This device was developed as a survey tool for physical and chemical characterization of contaminated nuclear stacks.
Erika McKinney	M.S.	Biomedical Engineering	Department project
Leydi Velez	M.S.	Engineering Management	Lessons Learned (LL) and Best Practices (BP) acquired in most DOE sites. Also, involved in the development of the D&D Knowledge Management Information Tool (KM-IT)

DOE Fellows Induction Ceremony



Conducted a total of 6 Induction Ceremonies since program inception in 2007. A total of **93 FIU minority STEM students** have been inducted as DOE Fellows.

DOE Fellows at Waste Management Symposia



A total of 95 DOE Fellows have presented at Waste Management Symposia since 2008. Obtained Best Student Poster 3 years in a row and Best Professional Poster in 2009.

DOE Fellows at WM Conference



WM Student Posters Sessions



Panel Member – Young Professionals

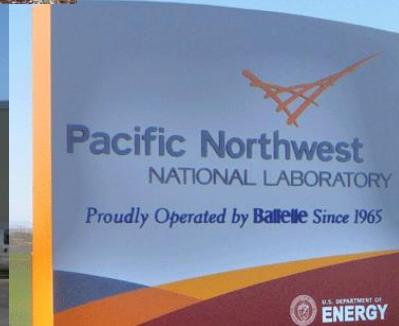
DOE Fellows Lecture Series



Internships – DOE HQ



Internships – DOE Nat. Labs



Internships – DOE Sites



Savannah River



NuVision Engineering Mooresville, NC



Columbia - Energy Richland, Washington

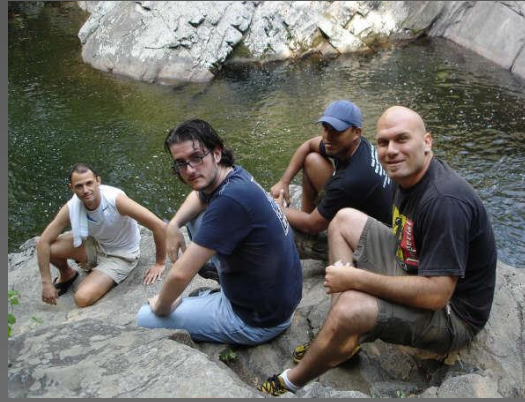
DOE Fellows Poster Exhibition



DOE Fellows Having Fun & Helping the Community



Phoenix, Arizona



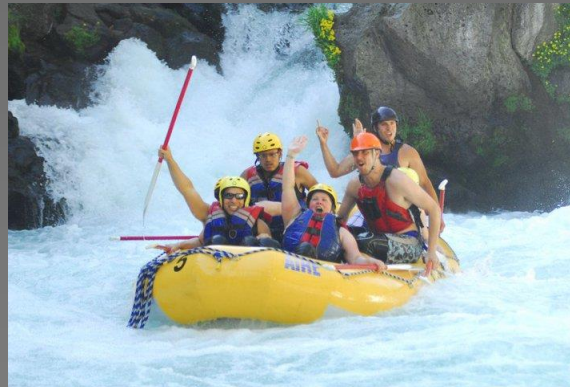
Great Smoky Mountains, TN



Beach Cleanup, Key Biscayne FL



Snowbowl Mountain, AZ



White Salmon, Washington



DOE Fellows Christmas Party 2009

Program Website and Facebook

<http://fellows.fiu.edu>

Follow us in Facebook at:

FIU Science and Technology Workforce Development Initiative

The website features a navigation menu on the left with items like Program Home, Program Description and Components, How to Apply, DOE Fellows Bios, DOE Fellows Internships, DOE Fellows Highlights, Events & News, Contact Us, DOE EM Newsletter, and Links. A central banner congratulates Rinaldo Galdamez as the First Place at FIU Libraries UG Student Research Award. Below this, the 'Featured DOE Fellow' section highlights Rinaldo Gonzalez Galdamez, including a 'Program Brochure' button. The main content area contains a 'Message from the Director' and 'FIU Students:' section with a photo of the director.

The Facebook page shows the profile for 'FIU Science and Technology Workforce Development Initiative'. It includes a cover photo with the ARC logo and a post from October 25, 2010, celebrating 'DOE Fellow of the Week - Nada Lima'. The post includes a link to her profile and a photo of her. Below it, another post from October 13, 2010, celebrates 'DOE Fellow of the Week - Edgard Espinosa'.

DOE Fellows Video



- The DOE Fellows Experience Video