

FACULTY OF EARTH & ENVIRONMENTAL SCIENCES (FEES)

Annual Report

[September 1, 2018 – August 31, 2019]



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1.0 INTRODUCTION

The Faculty of Earth and Environmental Sciences (FEES) is a relatively small, but very visible and visionary Unit that was designated to its current academic status (from the School of Earth and Environmental Sciences to FEES) in recognition of its outputs with respect to teaching and research, as well as the potential for accessing more grants and consultancy contracts.

Vision Statement

The vision statement of FEES is the following:

A community of students and staff dedicated to the provision of an exciting learning experience characterised by high-quality teaching and research that positively impact the development of the society.

Mission Statement

A highly visible and stimulating intellectual environment in which innovative and multidisciplinary teaching and research produce graduates with the technical skills, knowledge, and attitude required to support national development while enhancing the viability and reputation of the Faculty.

1.0 Names of Academic Staff during Academic Year 2018-2019

Full-time

- **Oyedotun, Temitope D. Timothy** / PhD (Geography, UCL, UK), MSc (GIS, Leeds, UK), MSc (Geography, UNILAG, Nigeria), BSc (Geography, AAUA, Nigeria)/Reader
- **Seon Hamer**, / MSc. (Natural Resources & Environmental Management – Climate Change, UWI – Cave Hill), BSc (Forestry, UG), Lecturer I and Assistant Dean, Department of Environmental Studies
- **Shanomae Rose**, / MSc.; MPH (Epidemiology, St George's University); BSc (Environmental Studies, UG); Dip. In Med. Tech; Lecturer II and Head, Department of Environmental Studies
- **Linda Johnson-Bhola**, / MSc. Urban and Regional Planning (Research), BA- Geography and Education; Cert. Ed. - Geography; Lecturer II, Head, Department of Geography
- **Denise Simmons**, / MSc. (Environmental Science), Postgraduate Diploma in Education (Science), BSc. (Chemistry), Lecturer II; Coordinator, Online Programme - BSc. Environmental Management and Technology

- **Ramona Dabee-Johnson** / Grad. DipEd., B.A.- Geography, Lecturer I; Department of Geography
- **Dina Khadija Benn** / M.Sc. (Geoinformatics); Postgraduate Certificate (Applied Digital Geography and GIS); B.A. (Geography and Mathematics), Lecturer II; Department of Geography
- **Judith Rosales**, PhD (Geography); MPhil (Ecology); MSc ; BSc (Biology) ; Professor and Coordinator of the PhD programme (Biodiversity), Department of Environment Studies
- **Rawle Edinboro**; MSc, Urban and Regional Planning; BA (Applied Geography); Certificate (Urban Management); Senior Lecturer, Co-coordinator- Land Administration and Management Programme (up to August 16, 2019).
- **Mr. Stephen Moonsamy**, MSc. in Agricultural Economics; BSc (Environmental and Natural Resources) Lecturer II, Department of Environmental Studies (**joined the Faculty in June 2019**)

On Sabbatical Leave

- **Paulette Bynoe**, PhD; MPhil; BA; AA; Senior Lecturer

Part-time

Ms. Claudette Foo
 Mr. Leslie Sobers
 Ms. Chrisel Leitch Shepherd
 Mr. Ashley Adams
 Mr. Isidro Espinosa
 Mr. Bunnell Bernard
 Mr. Ajay Arjoon
 Mr. Vincent Alexander
 Ms. Sandra Britton
 Dr. Mark Bynoe
 Mr. Teni Housty
 Mr. Phillip DaSilva
 Dr. Marlon Bristol
 Dr. Patrick Chesney
 Mr. William Harris
 Ms. Jocelyn Williams
 Dr. Diana Da Silva-Glasgow
 Ms. J. Ayana McCalman

Names of Non-Academic Staff



Keshawna Garnett-Adams, Administrative Officer 11



**Lavern Simon-Green
FEES Personal Assistant (ag)**



Esther Benn, Secretary



Nickeshia Sampson, Secretary



Oswald Washington, Office Attendant

1.1 Newly appointed and promoted academic staff

*Oyedotun, Temitope D. Timothy / Dean, Faculty of Earth and Environmental Sciences.
Hamer, Seon / Assistant Dean, Faculty of Earth and Environmental Sciences
Rose, Shanomae / Head, Department of Environmental Studies
Johnson-Bhola, Linda / Head, Department of Geography*

1.2 Major awards and special honours/distinctions to staff

Denise Simmons

- The University of Guyana was selected to participate in the 2019 OAS-Government of Chile Scholarship and Training Project for CARICOM Countries based on a proposal submitted by Denise Simmons to deliver a training course on Water Quality Monitoring.

Dina Khadija Benn

- Special Achievement in GIS (SAG) Award, ESRI - (on behalf of Department of Geography).
- Guyana Representative for curated group exhibition featuring Caribbean artists, Addis Foto Fest (5th Edition), Addis Ababa, Ethiopia.

Dr Temitope Oyedotun

- *Dr Temitope Oyedotun was invited to, and participated in, the **State-of-the-art Land Cover Change Methods** training/workshop held at National Space Science and Technology Center, Huntsville, Alabama, United States between August 20 – 23, 2019 under the full sponsorship of SilvaCarbon (an Interagency technical cooperation of the US Government) and USAID (through SERVIR Amazonia).*
- *Dr Temitope Oyedotun was one of the shortlisted participants at the **Guianas Regional Mangrove Ecosystems Training Workshop**, held at Coronie, Suriname between 06 – 10 May 2019, under the full sponsorship of WWF - Guianas.*

2.0 PUBLIC & PROFESSIONAL SERVICE

Members of Staff of the FEES provided various public and professional services at the international, regional and national levels, as highlighted below.

Oyedotun, T. D. T. / Services rendered

- *Chair, Environmental Assessment Board, Department of Environment, Ministry of Presidency, Cooperative Republic of Guyana – Serving as the Chair of the Board;*

- *(UG/FEES Team Member – Environmental Education and Awareness), “Strengthening technical capacities to mainstream and monitor Rio Convention implementation through policy coordinator” National Hydrographic Coordinating Committee - Represents the University of Guyana as Observer in the Ongoing Committee*
- *The International Research and Training Centre on Erosion and Sedimentation/The World Association for Sedimentation and Erosion Research - Journal Reviewer (International Journal of Sediment Research)*
- *International Water, Air and Soil Conservation Society (INWASCON) - Journal Reviewer (Geology, Ecology and Landscape)*
- *European Water Resources Association (EWRA) - Journal Reviewer (Environmental Processes)*
- *International Society for the Prevention and Mitigation of Natural Hazards – Journal Reviewer (Natural Hazards)*

Mr. Seon Hamer, Assistant Dean

- *Training of Bagotsville Community Group*
- *Training of Onverwagt Cooperative Society*

Ms. Shanomae Rose

- *Director, Protected Areas Commission Board*
- *Trainer / Enhancing Assessment using Moodle/CoETAL/13 February 2019/SEBI LR1*
- *Moderator / World Water Day Symposium hosted by the Hydrometeorological Department, Ministry of Agriculture on the occasion of World Water Day/22 March 2019/ The Marriot*
- *Trainer / Moodle Supported Assessment: Getting your assessment fully online /CoETAL/27 March 2019/Tain Campus*
- *Trainer / Career Guidance Session/ 5 June 2019/Queen’s College*

Ms. Linda Johnson Bhola

- *Member, International Geoscience Education Organisation, UNESCO*
- *Assistant Examiner for Caribbean Secondary Education Certificate/CXC-Geography*
- *Member, Caribbean Association of Planners*
- *Reviewer/Editor, Caribbean Urban Forum, Conference Proceedings*
- *Member of the Coastal Zone Task Force – for preparation of the Report on the State of Guyana’s Coastal Landscape – A Rapid Assessment. Ministry of the Presidency, Department of Environment*
- *Vice President - Guyana Planning Association*
- *Commenced the establishment of a STEM Laboratory at Eversham Primary School (Corentyne)*
- *Resource person for CSEC Geography School-Based Assessment (SBA.*
- *Advisor, University of Guyana Geographical Society*

Denise Simmons

- *Director, Board of Directors; Guyana Environmental Protection Agency;*
- *Member, National Climate Change Committee; Office of Climate Change; Ministry of the Presidency*
- *(UG/FEES Team Member – Environmental Education and Awareness), “Strengthening technical capacities to mainstream and monitor Rio Convention implementation through policy coordinator”*

Ms. Dina Benn

- *Member, National Policy on Geographic Information Working Group (UG Representative)*
- *Member, UG GIS Campus Coordinating Group*
- *Member, UG Quality Assurance Group (Faculty Representative)*
- *Member, GIS Day 2018 Committee*
- *UG/FEES Team member: “Green Climate Fund Readiness Proposal Preparation for Climate Resilient Agricultural Development”*
- *UG FEES Team member: “Environmental Public Education and Awareness for Mainstreaming of the Rio Conventions”*
- *Cartographic preparation, data plotting, and editing services for members of the public*

Rawle Edinboro

- *Advisor, Guyana Lands and Surveys Commission (up to February 28, 2019).*
- *Member, Guyana Planning Association*
- *Services rendered as part of the FEES team:*
 - *FEES Team (Rawle Edinboro, Paulette Bynoe et.al); completed reports and participated in events related to the preparation of the stocktaking report for the preparation of Guyana’s Green State Development strategy*
 - *Performed duties as Project Co-ordinator under the CityLab Car project (‘engaging students in sustainable Caribbean Cities’) – a European Union funded project that aims to stimulate innovation in teaching in higher education institutions in the Caribbean through problem-based learning*
 - *Performed duties as Co-coordinator with respect to the Land Administration and Management Diploma programme*

3.0 TRAINING WORKSHOPS CONDUCTED

- **Denise Simmons and Dawn Fox, *Introductory Water Quality Monitoring Course; August 2019***

- **Dina Khadija Benn**, *Disaster Information & Communication and GIS for DRM training modules*, Volunteer Emergency Response Team (VERT) Programme, 2019.
- **Linda Johnson-Bhola**, Conducted FEES Staff Seminar on the *Preparation and Assessment of valid and reliable test/examination items* on September 28, 2018.
- **Dr Temitope Oyedotun** with the Faculty - *Organised a two-Day Retreat to work on the Strategic Plan for the Faculty between – January 16-17, 2019.*
- **Dr Temitope Oyedotun** – led the Faculty to *organise a successful Teleconference with Centro De Investigación En Ciencia Aplicada Y Tecnología Avanzada Del Instituto Politécnico Nacional (CICATA – IPN) Querétaro, Mexico on 14 August 2019.*

4.0 RESEARCH

4.1 Completed Research/ Applied Research:

Oyedotun, T. D. T. / Quantitative Assessment of the drainage morphometric characteristics of Chaohu Lake Basin from SRTM DEM Data: A GIS-based approach. / 2018-2019;

Oyedotun, T. D. T. and Johnson-Bhola, L. / Integrated Assessment of Guyana Coastline Dynamics and Coastal Land Use / 2017-2019

Johnson-Bhola, L. Spatio-Temporal Analysis of the Physiographic and Environmental Characteristics of the Essequibo River Basin

Dina Khadija Benn. *Cognitive and usability studies on animated heat map technologies, 2018.*

Ramona Dabee Johnson. *Level of Preparedness of University of Guyana Geography Graduates for the Professional Work Environment.*

4.2 Research in progress:

Benn, K. *Usability testing of FOSS desktop and mobile applications for UAV mapping, 2019.*

Benn, K. *Preliminary spatial analysis of the Guyana river basins, 2019.*

Benn, K. *Modeling herbaceous crops under future climate scenarios, under the project “Development of an Evidence-Based, Gender Equitable Framework for Climate Smart Agriculture Interventions”, 2019.*

Linda Johnson-Bhola, *Spatio-Temporal Analysis of the Physiographic and Environmental Characteristics of the Demerara and Berbice River Basins*

Babajide, S., Oyedotun, T. D. T., Wu, Y., Babajide, E., Oguntoke, O., Ojo, D., Oloyede, S., Sonde, O. and Oderinde, O. / *Evaluation of the Impacts of Metal(loids) on Soil Samples, Serum Creatinine and Blood Urea Nitrogen of Residents in Selected Industrial Communities in a developing country.*

Oyedotun, T. D. T. / *Morphodynamic impacts of land use change on large river-estuarine basins of Asia, Africa and Southern America: a comparative geo-spatial evaluation / 2018 - 2021*

Moonsammy, S. / *Systematic Review of Valuation Work Conducted in Small Island Developing States*

Moonsammy, S. / *Sustainability Pathway of An Oil Dependent Economy*

Rosales, J. / *Biocomplexity in riparian corridors along fluvial landscapes of the Berbice watershed, Guyana in the Eastern Guiana Shield. 3 PhD students*

Rosales, J. / *Ecohydrological Study of Forested Wetlands of Ite (Mauritia) along the Headwaters at the Rupununi savannas landscapes of Guyana and the effects of climate change*

Rawle Edinboro / *‘Problem-based learning as an opportunity to bridge the gap between the classroom and the real world in pursuit of urban sustainability: an assessment of Guyana’s experience. Research to be completed in year 2020 as an academic output deliverable under the CityLab Car project.*

Ramona Dabee-Johnson / *An assessment of rate of occupancy and service provision in La Parfaite Harmonie (Phase 1) Housing Scheme/Development.*

5.0 TEACHING PROGRAMMES

5.1 Student Enrolment

During academic year 2018-2019 students’ enrolment for the undergraduate Diploma/Degree programmes was 218, for the MSc. programmes 32, and the PhD in Biodiversity Programme 3, giving a total of 253 in comparison with 208, 202, 230 in the academic years 2015-2016, 2016-2017 and 2017 - 2018 respectively. It is noteworthy that there was an increase in student enrolment by 23, using the last academic year 2016-2017 as the reference point. See Table below.

Programmes	2015-2016 Enrolment	2016-2017 Enrolment	2017-2018 Enrolment	2018-2019 Enrolment
UNDERGRADUATE PROGRAMMES				
<i>Diploma in Land Administration and Management</i>	NIL	NIL	NIL	31
<i>BA in Geo-Economics</i>	2	1	NIL	NIL
<i>BSc- Geography</i>	24	26	37	32
<i>BSc. - Environmental Studies</i>	142	154	142	116
<i>BSc. - Environmental Sciences</i>	NIL	NIL	7	39
GRADUATE PROGRAMMES				
<i>MSc –Environmental Management</i>	14	17	24	32
<i>MSc-Urban Planning and Management</i>	17	7	16	NIL
<i>Doctor of Philosophy (Ph.D.)</i>	9	7	4	3
TOTAL	208	202	230	253

During the academic year under review the FEES graduated a total of 32 persons. The table below provides dis-aggregated data.

Programme	2017	2018
B.A. (Geography)	1	1
B.A. (Geography/Economics)	1	-
B.Sc.(Environmental Studies)	24	30
Post-Graduate Diploma in Environmental Management	10	1
Master of Science in Environmental Management	-	-

5.2 Staff Development Session

The Faculty of Earth & Environmental Sciences (FEES) hosted a Staff Development Session on Testing and Assessment on September 28, 2018 from 09:00 – 12:00 h in the Faculty of Engineering and Technology Boardroom. The session, attended by new and continuing staff, was conducted by Ms. Linda Johnson-Bhola (see photos).



5.3 Student Prizes Awarded

REPORT ON THE FEES AWARD CEREMONY - MAY 2019

The Faculty of Earth and Environmental Sciences (FEES) hosted its Annual Students' Award Ceremony for the Academic Year 2017/2018 on **Friday, May 31, 2019 at 16:00 h in the Education Lecture Theatre (ELT)** (refer to photo).



The list of awardees consists of:

- **Mr. David Prince** (1st year) – Bachelor of Science Degree in Environmental Studies;
- **Mr. Michael Morrison** (2nd year) - Bachelor of Science Degree in Environmental Studies;
- **Ms. Nikita La Cruz** (3rd year) – Bachelor of Science Degree in Environmental Studies;

- **Ms. Bentia Davis** (4th year & Best Graduating Student) – Bachelor of Science Degree in Environmental Studies
- **Ms. Bentia Davis** (Best Research Project)
- **Mr. Nkofi Hodge** (Best All-Round Student) - Bachelor of Science Degree in Environmental Studies.

In addition, students were rewarded for their involvement in extra-curricular activities that aided in the development of the Faculty. These students are: Stacey Codogan, Gordon Nedd, Patrick Benjamin-Huntley, Alana Norville, Nikita LaCruz, Nkofi Hodge, Madhavi Indarjeet. These awards were sponsored by the Dean, Dr. Temitope Oyedotun. **Cubator Stephen** and **Kim Chan** were the recipients of the Sports awards which were sponsored by Ms. Denise Simmons and Ms. Shanomae Rose.

The Faculty, since its inception in 1993, (formerly the Environmental Studies Unit) recognized the importance of rewarding students each year (and at each level) for their academic excellence. A student, who, for his/her respective year, has attained the highest Grade Point Average (GPA), but not less than 2.7, is qualified for consideration.

The Faculty wishes to express sincere thanks to the sponsors: Conservation International Inc., Environmental Engineering Solutions, Shell Service Station, Development Policy & Management Consultants (DPMC), Environmental Management Consultants (EMC), E & A Consultants Inc., the Guest Speaker (Ms. Oneka Stellingburg) **who is an alumnus of FEES** and the Stakeholder Management Coordinator, Department of Environment, Dr. C. Nigel Gravesande (Registrar, University of Guyana), Professor Michael Scott (Deputy Vice-Chancellor-Academic Engagement), and the parents and guardians of all the students who received medals/awards (see photos).



FEES Awardees and Medalist for 2017/2018



The Guest Speaker – Ms. Oneka Stellingburg



Vote of Thanks – Ms. Benita Davis

6.0 PUBLICATIONS

6.1 Journal Publications

Oyedotun, T. D. T. and Burningham, H. (2019) *Comparable short-term morphodynamics of three estuary-coastal systems in southwest England*, **Regional Studies in Marine Science** Volume 31, <https://doi.org/10.1016/j.rsma.2019.100749>

Oyedotun, T. D. T. and Johnson-Bhola, L. (2019) *Shoreline change identification and analysis along the coast of Guyana, South America*. *Interdisciplinary Environmental Review*. Volume 20, Issue 1: pages 7 – 31. <https://doi.org/10.1504/IER.2019.098348>

Oyedotun, T. D. T. and Johnson-Bhola, L. (2019) *Beach Litter and Grading of the Coastal Landscape for Tourism Development in Sections of Guyana's Coast*. **Journal of CleanWAS**, Volume 3 (Issue 1), pages 01-09. DOI: 10.26480/jcleanwas.01.2019.01.09

Oyedotun, T. D. T. (2019) *Land use change and classification in Chaohu Lake catchment from multi-temporal remotely sensed images*. **Geology, Ecology and Landscape**. 3:1, 37-45, DOI: 10.1080/24749508.2018.1481657 (First published online in July 2018 but assigned January 2019 Edition of the journal)

Williams, M. S., Oyedotun, T. D. T. and Simmons, D. A. (2019) *Assessment of water and aesthetic quality of pit lakes in abandoned mines in Linden, Guyana*. **Geology, Ecology and Landscape**. DOI: 10.1080/24749508.2019.1633220

Rodríguez, M., J. Steiger, J. Rosales, et al. 2019. *Multi-annual contemporary flood event overbank sedimentation within the vegetated lower Orinoco floodplain, Venezuela*. *River Research and Applications*. DOI: 10.1002/rra.3510

Boston, Cecil, Judith Rosales, Jaipaul Singh, Rajini Kurup. 2019. *Knowledge and Utilization of Traditional Medicine for Type 2 Diabetes Mellitus among Residents of Pakuri (St. Cuthbert's*

Mission) in Guyana. *Journal of Complementary and Alternative Medical. Research* DOI: 10.9734/jocamr/2019/v7i330100

Boston, Cicil, .Jaipaul Singh, **Judith Rosales**, Rajini Kurup. 2019. *Comparison and Effectiveness of Complementary and Alternative Medicine as against Conventional Medicine in the Treatment and Management of Type 2 Diabetes. Journal of Complementary and Alternative Medical. Research.* DOI:10.9734/JOCAMR/2019/v7i230097

Johnson-Bhola, L. *Effects of Rural Land Tenure System on Mangroves Management in Corentyne, Guyana.* IntechOpen. 2019. In press.

Oyedotun, T. D. T. (submitted) *Quantitative Assessment of the drainage morphometric characteristics of Chaohu Lake Basin from SRTM DEM Data: A GIS-based approach.* (submitted for publication).

6.2 Book Chapters

Johnson-Bhola, Linda, *A Guide to the Principles and Practices of Geography School-Based Assessment.* (Text Book). University of Guyana. In press.

6.3 Conference Proceedings

Oyedotun, T. D. T. and Johnson-Bhola, L. (2019) “Assessment of Guyana’s Coastline Morphodynamics in the face of sea level rise” – the conference paper presented at the Climate Adaptation Initiative Conference of Earth Institute of Columbia University tagged “At What Point Managed Retreat? Resilience Building in the Coastal Zone” held between 19 – 21 June, 2019 at Columbia University, New York; (<http://adaptation.ei.columbia.edu/conference/schedule/june20/>)

Ruiz-Luna, A., Berlanga-Robles, C., Hernández-Guzmán, R., Montijo-Galindo, A., Bautista-Bautista, R., Navarro-Hernández, A. G., and **Oyedotun, T. D. T.** (2019) *Cambios recientes en el paisaje urbano de Mazatlán (Sinaloa, México) y futuros escenarios ambientales* (English: *Recent changes in the urban landscape of Mazatlán (Sinaloa, Mexico) and future environmental scenarios*) being the paper presented at XVIII CONGRESO INTERNACIONAL Y XXIV NACIONAL DE CIENCIAS AMBIENTALES (English: XVIII INTERNATIONAL AND XXIV NATIONAL CONGRESS OF ENVIRONMENTAL SCIENCES), 03 – 07 June 2019 at Mazatlán, Sinaloa, Mexico. Conference proceeding: pages 1 – 12.

6.4 Project Reports

- **Benn, Dina Khadija** *Report on Spatial Database Development and Mapping for CBDRM Support at Baramita.* Civil Defence Commission, 2018.

- **Benn, Dina Khadija** Seventeen (17) regional hazard exposure and vulnerability maps. In *Regional Multi-hazard Plan for Demerara-Mahaica*, 2018.
- **Benn, Dina Khadija** Five (5) hazard exposure maps. In *Municipality Disaster Risk Management Plan* (for Anna Regina, Bartica, Linden, Mabaruma, and New Amsterdam), 2018.
- Eitzinger, A., **D. Benn**, E. Rawle, E. Charles, G. Hyman, L. Daggers, **J. Rosales**, M. del Rio, M. Ifill, P. Siles, **S. Hamer**, and W. Franchesconi (Jan. 2019). *Prefeasibility Report of the GCF Readiness Proposal preparation for climate-resilient agriculture development in coastal regions of the Co-operative Republic of Guyana*. General edition by Team Leaders Hyman, G. and J. Rosales. UG-CIAT University of Guyana-Center of International Agriculture in the Tropics. Prepared for FAO Guyana and OCC. Participation and coordination of the development of individual extended reports FAO Project 2018.
- **Johnson-Bhola, Linda**. Report on “Systematization and descriptive analysis of policies and regulations that affect the conservation and sustainable use of mangrove ecosystems in Guyana Project” Conservation International Guyana. 2019.
- **Johnson-Bhola, Linda**. Report on baseline data and the GEF alternative - Project design for the Strengthening the Enabling Framework for Biodiversity Mainstreaming and Mercury Reduction in Small-Scale Gold Mining Operations Project - GEF FSP Project Preparation Phase. GoG/UNDP. 2019
- **Johnson-Bhola, Linda**. Prepared more than 15 environmental articles for the Strengthening Technical Capacities to Mainstream and Monitor Rio Convention through Policy Coordination Project –DoE//UNDP (2019)

6.5 Technical Presentations

- **Professor Judith Rosales**; *UG Tain Talks “Biodiversity and the Future of Guyana. Talks 15. Nov. 2018.*
- **Denise Simmons**; *Key Elements of An Undergraduate Research Programme*; Third Annual Undergraduate Research Conference; University of Guyana, Turkeyen Campus; April 2019.
- **Denise Simmons and Paulette Bynoe**; *Guyana’s EIA process in the context of the emerging oil and gas sector*; IAIA 2019; Brisbane Convention and Exhibition Centre; April 2019.
- **Paulette Bynoe and Denise Simmons**; *Environmental Impact Assessment, Community Engagement and Sustainability: Lessons from Guyana*; IAIA 2019; Brisbane Convention and Exhibition Centre; May 2019.
- **Denise Simmons**; *Overview of Climate Change*; *Sandwatch Workshop*; NCERD;

Georgetown; May 2019.

- **Denise Simmons and Paulette Bynoe**; Climate, Society, Policy Link: A Case Study of Lethem in Region 9, Guyana; Caribbean Climate Modellers Consortium Meeting; UWI Mona, Jamaica; August 2019.
- **Dina Khadija Benn**; Regional Disaster Risk Profile Methodology, Regional Consultation on Hazards and Vulnerability for Demerara-Mahaica. Cara Lodge, Georgetown, October 2018.
- **Oyedotun, T. D. T. (2019)** “Assessment of Guyana’s Coastline Morphodynamics in the face of sea level rise” – the conference paper presented at the Climate Adaptation Initiative Conference of Earth Institute of Columbia University tagged “At What Point Managed Retreat? Resilience Building in the Coastal Zone” held between 19 – 21 June, 2019 at Columbia University, New York;
(<http://adaptation.ei.columbia.edu/conference/schedule/june20/>).
- **Garnett-Adams, Keshawna** – participated in the American Association of University Administrators (AAUA) Annual Leadership Seminar 2019 under the Theme entitled ‘*Creative and Effective Approaches to Common Problems Confronting American Higher Education*’. The leadership seminar was held from June 6-7, 2019 in Detroit, Michigan.

6.6 Major Research Projects - Completed Undergraduate and Post-graduate Students during 2018/2019

Below is a list of selected undergraduate research projects that have been conducted by students of FEES.

- A study into the use of hydroponics as an effective means of increasing food supply within individual households;
- An Assessment of the State of Fisheries in Rewa Village;
- An Examination of the Foraging Behavior of Africanised honey bees (*Apis mellifera scutellata*) and to compare the Quantity of Honey produced in two (2) locations;
- Application of Electrocultural Practices to Black-Eyed Pea Seedlings;
- A comparison of the effects of boiling and washing on the residual amount of Acetamiprid and the presence of metaflumizone in cabbage plants from Farm A and B;
- An investigation of wood waste disposal practices in sawmills along the East Bank and East Coast of Demerara, Region 4;

- An Assessment of Noise Levels Created by Sawmilling Activities on Residential Areas in 2 identified Locations in Region 3;
- A community perspective on the land Use changes in Mc Doom;
- To Evaluate the effectiveness of *Salvinia Molesta*, *Pistia Stratiotes*, *Lemna minor*, *Typha Latifolia* and *Azolla Filiculoides* in removing crude oil from water;
- An investigation into the impacts of land use changes on the road network of Great Diamond, East Bank Demerara;
- An evaluation to use the phytoremediation to treat wastewater generated by Banks DIH wastewater treatment plant;
- An investigation into the suitability of re-fill water for human consumption and factors that influence its consumption/non-consumption within two communities;
- An assessment of the potential of Elephant grass (*Pennisetum purpureum*) pellets as a source of thermal energy; and
- Bioremediation An assessment of the purification capacity of green algae (chlorophyta) with domestic wastewater.
- An Investigation into the Allocation of Land Titles: A Plantation Friendship. East Bank Demerara.
- An Assessment of the Small Scale Licensing Process at Guyana Geology and Mines Commission.
- An Investigation into the use of Unmanned Aerial Vehicles (UAV) and Global Navigation Satellite Systems (GNSS) to benefit the Land application process at Guyana Lands and Surveys Commission (GL&SC).
- Assessing the Knowledge, Attitude and Practice of Climate Change Education of Primary School Teachers in Region 3

7.0 NOTABLE VISITORS

- Mr. Denzil Roberts, Chief Fisheries Officer, Department of Fisheries, Ministry of Agriculture delivered a lecture to the class of ENV 3210 on Fisheries sector in Guyana.

- CityLab Car project partners, namely Dr. Asad Mohammed from the University of the West Indies, St. Augustine, Trinidad and Ms. Angelika Namdar from Anton de Kom University, Suriname.

- **Visiting Students from Suriname**

Fifty-three (53) students and two (2) tutors from the Instituut voor de Opleiding van Leraren (Institute for the Training of Teachers), Paramaribo, Suriname who are pursuing studies in the discipline of Geography were hosted by the Department of Geography-Faculty of Earth & Environmental Sciences on May 3, 2019. This educational tour was facilitated by the Embassy of the Republic of Suriname in Georgetown/Guyana. Ms. Linda Johnson-Bhola – Head of the Geography Department conducted a session with the contingent and provided details about the exciting programmes being offered as well as career opportunities and potential for collaboration(see photos).



Students listening attentively to the Presentation from Ms. Linda Johnson-Bhola, HOD-Geography



- Dr Riad Nurmohamed of the Faculty of Technology, Anton de Kom University of Suriname visited the Faculty on the 26 February 2019 for deliberation of postgraduate research and student-supervision collaboration, especially in the support of their Master of Science Programme in Sustainable Management of Natural Resources (SMNR) and FEES's Master of Science in Environmental Management programme.



Dr Temitope Oyedotun and Dr Riad Nurmohamed during his visit to the Faculty

8.0 OTHER IMPORTANT INFORMATION

8.1 GIS DAY 2018 – November 14, 2018

The Faculty of Earth and Environmental Sciences, in collaboration with local agencies and partners, hosted GIS Day 2018 on November 14, 2018 under the theme “Visualising Guyana with Drone Mapping Technology”, as part of activities for Geography Awareness Week. The event was held at the Education Lecture Theatre and featured presentations and demonstrations in UAS technology and mapping techniques. In his opening remarks, former Vice Chancellor of the University of Guyana, Prof. Ivelaw Griffith, encouraged the students (who represented senior classes in various schools) in attendance to pursue academic excellence and to actively engage with emerging technologies from an early age.

The event’s keynote speaker was Commissioner Trevor Benn of the Guyana Lands and Surveys Commission. Commissioner Benn emphasized the national thrust to employ more advanced technological systems to conduct high accuracy geographic surveys. Opening presentations were delivered by FEES students through the University of Guyana Geographical Society (UGGS) and the Eco-Trust Society. The presenters introduced UAV concepts, technologies, methods, and capabilities. Technical presentations were made by representatives of the Central Housing and Planning Authority, GeoOrbis Inc., and the Guyana Drone Operators Association. Officers of the Guyana Civil Aviation Authority also discussed the regulations and requirements in place for local UAV operators.

The event was attended by the GIS community, UoG students, and secondary school students, after which the attendees were able to interact with drone operators and observe a multi-rotor drone launch and flight demonstration (see photos).



8.2 City Lab Erasmus Project – Guyana National Seminar



The project, which commenced in October 2017, seeks to increase the societal relevance of Higher Education Institutions in the Caribbean region through creating a more structural link between universities and external societal actors such as public authorities.

The project is a collaboration between fifteen European and Caribbean Higher Education Institutes: University of Antwerp (Belgium), Aalborg Universitet (Denmark), Universidad Politecnica de Madrid (Spain), Politecnico di Torino (Italy), Vrije Universiteit Brussel (Belgium), the University of the West Indies (Trinidad and Tobago), University of Trinidad and Tobago (Trinidad and Tobago), **University of Guyana (Guyana)**, Government Technical Institute - Ministry of Education (Guyana), Institute for Graduate Studies and Research (Suriname), Polytechnic College Suriname (Suriname), Universidad Iberoamericana (Domenican Republic), Pontificia Universidad Católica Madre y Maestra (Domenican Republic), University of Technology (Jamaica) and Caribbean Maritime Institute (Jamaica).

On Thursday, July 25, 2019 the FEES hosted the Guyana National Problem-based Learning (PBL) Seminar (See photos). The main purpose of the Guyana National Problem-based Learning (PBL) Seminar was to sensitise stakeholders on the CityLab Car Project and to disseminate Problem-based Learning (PBL) principles to different target groups and garner their feedback. The seminar also sought to discuss Problem-based Learning (PBL) for Urban Sustainability with both on-campus and external stakeholders, with the aim of garnering support for Problem-based Learning (PBL) and fostering partnerships between the university, higher education institutes and external stakeholders. The key expectation at the end was that all seminar participants would have developed a good understanding of how Problem-based Learning can help in effectively responding to the challenges of urban sustainability.

As the CityLab Car Project unfolds, the Faculty of Earth and Environmental Sciences will continue its efforts in infusing or integrating problem-based learning techniques into appropriate existing courses of study.



Dr. Mohammed and Ms. Namdar meeting with U.G and GTI teams on July 24, 2019





The CityLab Project Partners: U.G; GTI; UWI and Anton de Kom University



City Council representatives



Seminar Participants

8.3 World Water Day

World Water Day 2019 (WWD 2019) was celebrated on March 22, 2019 under the theme “Leaving no one behind.” The Faculty of Earth and Environmental Sciences (FEES) responded to an invitation from the Guyana Water Incorporated (GWI) and arranged for members of the Eco-Trust Society to attend the GWI WWD 2019 celebration in Linden (see photos). Additionally, the Faculty attended the Ministry of Agriculture, Hydrometeorological Service’s WWD 2019 celebration at the Marriott Hotel, where a staff member (Ms. Shanomae Rose) chaired the session. Oral presentations were delivered and the Eco-Trust Society participated in a display (see photos).

As part of a field exercise to Linden by the ENV 3210: Aquatic Sciences class, in observance WWD 2019, the students of ENV 3210 delivered three oral power point presentations under the theme “Leaving no one behind” to students of the McKenzie High School (see photos below). One student also recited a poem and the students of the school were provided with an opportunity to question the University students. Following this, the students toured the Ameila’s Water Treatment Plant (refer to photos).



Students being greeted by the Head Teacher, McKenzie High School. (Mr. Wright is to the first person to the left)



Oral presentation - Group 1



Oral presentation by representative of second group of students of ENV 3210



Oral presentation - Group 2



Students of McKenzie High School



Students touring the Amelia's Ward Water Treatment Plant



8.4 Open Career Day 2019

The University of Guyana held its Annual Career Day Event on Friday, February 15, 2019. The Faculty of Earth & Environmental Sciences (FEES) participated in this event and attained 3rd place. The theme for this year's Annual Career Day was 'Your Vision, Our Mission'.

The FEES displayed various models that depicted the Theme. The FEES once again took the opportunity to encourage students to apply for the current programmes; the BSc. in Environmental Studies, BSc. in Environmental Science and the BSc in Geography, MSc in Urban Planning and Regional Planning (revised MSc in Urban Planning & Management) and the MSc in Environmental Management. For the second year, the PhD in Biodiversity Programme was on display. Moreover, the staff discussed numerous career paths that the students can undertake after attaining a Degree from the Faculty. Graduates and Undergraduate students were selected to produce video recordings to explain the Faculty's Mission. Further, the FEES explained some of the course contents to the students which allowed them to appreciate the programmes offered by FEES. FEES also showcased the Water Testing equipment, the GIS equipment such as the Drones and the GPS, and how to transform the Stabroek area in Georgetown (refer to photos).



MSc. UPM Booth



Ms. Samaroo interacting with the Judges



Staff interacting with the participants



Students interacting with the participants



Students interacting with the participants



PhD-Biodiversity Booth

8.5 Earth Hour 2018

The ENV 3210 - Aquatic Sciences class participated in the Office of Climate Change's Earth Hour activity held in Linden on March 30, 2019. At the concert, the students represented the FEES by reciting a poem.

8.6 Off-Campus training- Field Exercise to Alfobaka Hydropower Plant in Suriname



Students visitation to Alfobaka Hydropower Plant in Suriname

The Master of Science in Environmental Management for the academic year 2018/2019 Course ENV 5208 – Sustainable Energy and Development in partial fulfillment of the course conducted a field exercise to the Alfobaka Hydropower Plant in Suriname. The trip was conducted mainly to expose the students to a renewable energy technology and to build capacity in the area of sustainable energy development and its applications. Students attending this field exercise were able to collaborate and foster the exchange of ideas and technical know-how related to hydropower development. This tour plays a vital role in the promotion, transfer and dissemination of technology within the various organizations represented by the students.

8.7 FEES Orientation Day 2019

The Faculty of Earth & Environmental Sciences (FEES) held its Annual Orientation Exercise on August 29, 2019 at 17:00 hrs. in the SEBI Building. Approximately eighty (80) students from the Undergraduate and Graduate level attended the session and listened to a presentation by the Guest Speaker – Dr. Mark Bynoe. Other presentations on Plagiarism, a Desirable Approach to your Programme of Study were made. Students were also informed of the two existing clubs/societies (UGGS and Eco Trust) in the FEES (See photos).



Dean Temitope Oyedotun – Introductory Speech



Guest Speaker Dr. Mark Bynoe, Director, Department of Energy



Library Representative



Representative – Eco Trust Society



Representative – UG Geographical Society (UGGS)



A section of the Audience

8.8 TELECONFERENCE ACTIVITY

On Wednesday, August 14, 2019, The FEES hosted a successful teleconference with Centro De Investigación En Ciencia Aplicada Y Tecnología Avanzada Del Instituto Politécnico Nacional (CICATA – IPN) Querétaro, Mexico. Six (6) students from our University presented their research and had feedback from both the staff on the ground and the academics from Mexico. Similarly, five (5) researchers (MSc and Ph.D. students) from CICATA-IPN presented their research at the conference and they also benefitted from questions, views, and comments from the academics on both sides (see photos). Two students (one from each institution) did not make their presentations. They were both on traveling duties and could not arrive on time for the participation. Minister Jorge Luis Hildalgo Partida was present to deliver opening remarks. In his remarks, the Minister emphasized the importance of collaboration in strengthening academic research.

The topics presented by the University of Guyana's students are:

1. An Investigation of Selected Metals in Soils and Food Crops Grown on the Mined-Out Bauxite Soils of Guyana by **Brijesh Singh**
2. An assessment of the ameliorating effects of different rates of Biochar on Tiwiwid Sand and the growth and production of Capsicum chinense Jacq by **Basudeo Dwarka**
3. Macrophytes Wetland Communities along the Upper Berbice River Basin of Guyana: Relationships with sediments and selected water chemistry parameters by **Gregory Hodge**
4. Evaluation of the changes in the Demerara River channel morphology using Remotely Sensed and Topographical Data by **Alana Norville**
5. Spatio-temporal Features and Impacts of Floods along East Bank Canje, Berbice from 2008 to 2018 by **Muzzammil Mohabir**
6. Microalgae biodiversity in Marine Coastal and Estuarine environments of Guyana by **Seon Hamer**.

The topics presented by the CICATA-IPN's students are:

1. Estimation of Forest Carbon from Aerial Photogrammetry by **Dagoberto Pulido**
2. Soil temperature estimation through aerial multispectral and thermal images by **Daniela Basurto**
3. LiDAR and camera sensor fusion through deep learning for urban tree geolocalization by **Omar Montoya**
4. Terrain thermal mapping using small UAVs by **Othon González**
5. Molecular and visual markers to detect the presence of phytopathogens fungus on *Vitis vinifera* fields by **Mayra Candido**



Dr Temitope Oyedotun moderating the conference



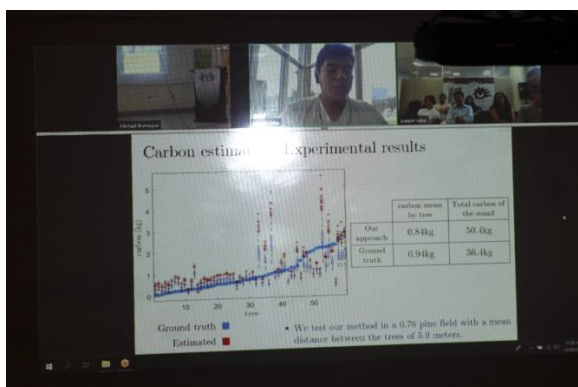
Minister Jorge Luis Hildalgo Partida delivering the opening remark



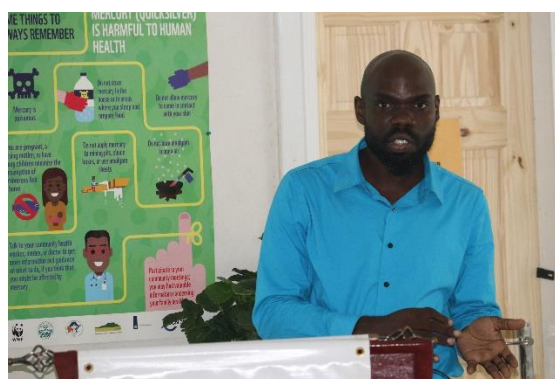
Some of the UG participants at the conference



Brijesh Singh presenting his research



Dagoberto Pulido from CICATA-IPN, Mexico presenting his research



Seon Hamer presenting his research

8.9 OAS-Government of Chile Scholarship and Training Project – Water Quality Monitoring Training

In response to a “Request for Proposals: 2019 OAS – Government of Chile Scholarship and Training Project for CARICOM Countries”, a proposal was submitted on behalf of the University of Guyana (UG) by Ms. Denise Simmons, Lecturer, FEES, through the Office of the Deputy Vice Chancellor, Academic Engagement (DVC, AE). The University was subsequently informed that the UG was one of the institutions selected to participate in the “2019 OAS-Government of Chile Scholarship and Training Project for CARICOM Countries.” Through this project, the University received funds to offer an Introductory Water Quality Monitoring course over the period August 13 – 16, 2019 at the University of Guyana, Turkeyen Campus to Guyanese.

The 4-day course/workshop provided an introduction to water quality monitoring and it covered topics on water quality concepts, and water quality sampling and analysis, and practical/hands-on exposure to sample collection and field-based measurement of selected water quality parameters. On the first day of the training, lectures which aimed at establishing fundamentals of water quality analysis were delivered. Day 2 consisted of lectures on water quality analysis, collection of water samples and field-based analysis. The third day involved a field exercise to the East Demerara Water Conservancy to collect water samples during which selected water quality parameters were also measured in the field. The course concluded with an introduction to data handling and reporting. The training was an interactive one which required the participants to present on their current involvement in water quality monitoring on the first day. On the last day, the participants

were required to make oral presentations based on analysis of the data that they obtained from the field exercise (refer to photos).

Twenty-five individuals from all the ten administrative regions of Guyana were selected and participated in the training. The selected applicants were employed with the following entities: the Ministry of Natural Resources; the Ministry of Agriculture; the Guyana Sugar Corporation Limited; Regional Environmental Health Departments; the Ministry of Education; the Environmental Protection Agency; the Guyana Geology and Mines Commission; the Iwokrama International Centre for Rainforest Conservation and Development; and indigenous peoples nongovernmental organization (NGO).

The training was delivered by Dr. Dawn Fox, Senior Lecturer, Department of Chemistry, Faculty of Natural Sciences and Ms. Denise Simmons, Lecturer II, Faculty of Earth and Environmental Sciences. In order to receive a Certificate of Achievement, the participants were assessed based on their participation during the training, analysis of field data and a quiz. All participants who acquired more than 50% pass rate were awarded with the certificates.

Upon successful completion of the course, participants were able to:

- describe different water pollutant groups and selected water quality parameters
- describe how to collect surface and ground water samples
- collect surface water and tap water samples, observing the necessary protocols
- use field equipment to measure selected water quality parameters
- apply basic statistical techniques for water quality data evaluation



Participant using a Secchi disc



Participant using a depth sampler



Participants preparing to use a colorimeter to measure the concentration of phosphate in the water sample

8.10 Public Lecture

The Faculty hosted Dr Byron A. Cox for a public lecture on “**The Challenge of Sustaining the Life of this Planet: What WILL You do?**” at the request of the Guyana Lands and Survey Commission through the University of Guyana on Thursday 11 October 2019 (refer to photos). Dr. Richard Byron A. Cox delivered the lecture during his visit to Guyana while on official duties. Dr. Byron A. Cox is a Caribbean national who is currently a senior official of the UNCCD secretariat. This lecture strategically served to increase wider public awareness and participation in understanding the role of the UNCCD and the strides that Guyana has made under the Convention.



Dr Byron A. Cox delivering his lecture



Commissioner Trevon Benn delivering his remarks



Professor Judith Rosales of the Faculty and Mr Seon Hamer anchoring the event



Student, Ms Alana Norville making a presentation during the lecture. Ms Denise Simmons asking a question during the lecture



Cross-section of participants at the lecture.

8.11 INTERNATIONAL TRAINING

Dr Temitope Oyedotun, Dean of the Faculty (FEES) participated in the training and workshop on **State-of-the-art Land Cover Change Methods** held at National Space Science and Technology Center, Huntsville, Alabama, United States between August 20 – 23, 2019 under the full sponsorship of SilvaCarbon (an Interagency technical cooperation of the US Government) and USAID (through SERVIR Amazonia) (see photos).

The workshop trained participants in the use of open-source tools and improved methodologies for monitoring and estimating land cover change in Latin America. Topics covered include getting started with Google Earth Engine (GEE) and land use change algorithms such as LandTrendr and CCDC, tailored for in-region academics and researchers. An overview of data collection platforms such as SEPAL (from FAO) and Terra-I (from CIAT) were presented. An introduction to the use of Synthetic Aperture Radar (SAR) data from Sentinel-1 for forest change detection and SERVIR's work in land use and land cover change applications was also discussed.

The workshop was organized by SilvaCarbon, a technical cooperation program executed by the United States government in tropical countries to optimize carbon monitoring and reporting in different types of landscape, and the photos here are presented courtesy of SilvaCarbon.



Dr Temitope Oyedotun with the travelling participants



Group photos of all the participants and trainers



Dr Temitope Oyedotun with the SERVIR Amazonia team



Dr Temitope Oyedotun explaining that the patterns shown in the coastal zone as observed in the Sentinel 1 images at the training.

8.11 STUDENTS PRESENTATION AND PARTICIPATION AT INTERNATIONAL CONFERENCES

During the 2018/2019 Academic year, three students from FEES participated in international conferences where they presented the findings of their undergraduate research. Ms Marisa Williams presented her paper at the National Conference on Undergraduate Research (NCUR) 2019 that was held at Kennesaw State University, Atlanta Georgia USA, from the 11 – 13th April 2019 (refer to photos). The students (Ms Madhavi Indarjeet, Krystyne Jeune and Benita Davies) presented their research works at the 2018 Florida International McNair Scholars Research Conference which was held at Florida International University. Also, Ms. Benita Davies presented her work at the Second World Congress on Undergraduate Research that took place at the Carl von Ossietzky University Oldenburg, Germany, from May 23 - 25, 2019.



Marisa being part of the Campus tour of the University – and giving the oral presentation at the second environmental and sustainability session held in the Clendenin Building, Kennesaw State University.



Ms Benita Davies presenting her paper at the World Congress of Undergraduate Research in Germany



Ms. Benita Davies with other University of Guyana representative at Florida International McNair Scholars Research Conference



Tweet about Benita Davies presentation at WorldCUR 2019

9.0 CONCLUSION

This summarised Annual Report for the 2018/2019 Academic Session has provided a brief of some of FEES's achievements for the academic year. The many recorded successes that have been made in the year have boosted the confidence of staff and students. It is anticipated that many advancements will be recorded as the Faculty continues in its mission of developing a highly visible and stimulating intellectual environment. Indeed, the Faculty remains in a position to continue to enhance the students' positive experiences as the culture of research and excellence in

teaching grows. The FEES will continue to explore diverse means of engagement with our local, regional, and international communities. The Faculty appreciates the consistent and ever-increasing unquantifiable support of the staff, students, alumni, the wider University community and for the strong belief in the Faculty as we advance in our calling of making the Faculty a quality-driven, sustainable and comprehensive Faculty, both locally and internationally.