

DEPARTMENT OF LIFE SCIENCES

Eric Hyslop, BSc(Hons.) Aberdeen, PhD Open University
– Head of Department

WORK OF THE DEPARTMENT

Again 2008-2009 was a year which saw major changes and again principally these were concerned with expansion of student intake in the undergraduate programme, particularly at level I.



Department's performance during 2008/2009

Undergraduate programme

In level I courses the average enrolment increased from 419 in 2007-2008 to 506 in 2008-2009. Again this placed severe strain on the resources of the department, particularly on the physical space. Equipment shortfalls were to some extent mitigated by acquisition throughout the academic year, although delays in receipt of materials were unhelpful. Similarly average enrolment in level 2 courses increased from 116 in 2007/8 to 154 in 2008/9 with corresponding implications for the resources and in particular for the operation of field courses

The Marine Biology major was offered for the first time and the course Caribbean Biodiversity, BL39D/BIOL3019, was reinstated at level III.

Undergraduate teaching

Using student assessment as the defining criterion, the Department of Life Sciences was once again able to maintain a very high standard of teaching with the lecturer mean value in both semesters I and II at 4.2 (Ranges: semester I: 3.0 - 4.8; semester II: 3.2 - 4.8). In addition, the course mean values were also similar and high in both semesters at 3.85 and 3.81 respectively (Ranges: semester I: 3.4 - 4.3, semester II: 3.5 -

4.2). Several staff members consistently scored above 4.5 in all their assessments.

Staffing Developments and Awards

Three members of staff were promoted to senior lecturer in 2008-2009: Dr. Karl Aiken, Dr. Eric Garraway and Dr. Paula Tennant. Drs. Kurt McLaren and Byron Wilson were co-recipients of the Principal's award for the research project which attracted the most external funding, for the project "Habitat and biodiversity conservation in the Cockpit Country and Black River morass of Jamaica" funded by the MacArthur Foundation. Dr Judith Mendes received a J\$60,000,000 EDULINK grant to promote education on coral reefs.

Graduate programme

The Department of Life Sciences finalized a cohort of students in the MSc Plant Production and Protection but was unable to proceed with a new intake into the merged environmentally based MSc due to delays in programme although these administrative difficulties were overcome during the course of the year and the programme will be offered in the 2009-2010 academic year as MSc MATE (Marine and Terrestrial Ecosystems: Assessment, Conservation and Management).

In terms of research students, five new students were admitted to the department's various MPhil programmes and one candidate successfully transferred from MPhil to PhD Four PhD theses were successfully defended during the 2008-2009 academic year.

Sixteen persons graduated with postgraduate qualifications in November 2009.

Outreach

Pre-University School October 9, 2008 – February 26, 2009 CAPE and CSEC Laboratory Sessions (110 students)	the department earned \$221,240.00
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Caribbean International College December 22-29, 2008 CAPE Laboratory Sessions (18 students)	the department earned \$26,000.00
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The Centre for Marine Sciences (CMS) was co-sponsor of a meeting of the Jamaica Institute of Environmental Professionals held May 26th and 27th, 2009 in the Pegasus Hotel, Kingston

The Department of Life Sciences hosted a workshop in conjunction with the Fairchild Tropical Botanical Garden, Centre for Tropical Plant Conservation on Conservation Genetics and Molecular Biology from 13th to 24th July, 2009, this was attended by graduate students and interested researchers in government departments and NGO's.

The Discovery Bay Marine Lab continues to provide services via the recompression chamber which is in the process of being refitted.

The Port Royal Marine Laboratory made good progress in the establishment of a "Mangrove Biodiversity Centre" throughout the year. In addition, the establishment of a coastal plant nursery, to produce stock for the replanting of the Palisadoes and surrounding areas is showing rapid advances. General landscaping and planting of the area around the lab is also progressing well. All of these developments when completed will help increase the attractiveness of the facility as a venue for promoting environmental awareness among visitors.

Research Output In 2008-2009

The research output of the department consisted of 17 articles in referred journals and 20 conference presentations, a number of which were given at international conferences overseas. The publication rate of a few individuals is particularly impressive, but some persons are not publishing as they should. The crude average, based upon 16 academic staff at Mona and 4 at Scientific Officer level or above, a total of 20 staff, gives an average of 1.85 publications, somewhat down on the 2.8 recorded in the 2007-8 departmental report. However the research output in terms of refereed journal papers is 0.85, still low, but an improvement on the previous year's mean of 0.55.

Achievement of 2008/9 targets

The department was unable to finalize changes to the level 2 and 3 courses in the undergraduate programme although we did achieve success in maintaining teaching standards in the face of expanded numbers. Both Port Royal and Discovery Bay Marine labs continued to accommodate students and researchers. The latter showed a 31%

increase in visitor numbers in 2008/9 with 1703 visitors as compared to 1302 in the previous year. A total of 718 students from 23 schools visited in 2008/9 compared to 583 from 14 schools in 2007/8 Port Royal Marine lab continues to offer Mangrove and Kingston Harbour tours to schools. 558 visitors from a variety of educational institutions were hosted during January to May 2009. The surrounding mangrove wetland is used by many high schools to satisfy the School Based Assessment component of CSEC. International Coastal clean-up activities, World Wetland's Day and mangrove replanting activities were also hosted out of the laboratory.

Research Based targets

Referee based publication average increased from 0.55 to 0.85 per staff member although, as noted above the increase was not evenly spread. Some graduate students were able to present their work at internationally credible conferences but again this was limited to a few individuals. Administrative difficulties prevented implementation of the new environmentally based MSc.

Targets for 2009/10

- To examine and modify accordingly the level 2 and 3 curriculum in the undergraduate programme.
- To implement teaching of the MSc (MATE)
- To expand infrastructure in the light of increasing enrolment in the undergraduate programme.
- To continue expansion of facilities at Port Royal Marine Lab with a view to improving its effectiveness as a venue to promote environmental awareness

Research Based Targets for 2009/10

- To increase throughput rate of students in research based postgraduate programmes
- To increase average staff publication rate in peer reviewed journals.
- To further encourage research students to present their findings at international conferences.

PAPERS PRESENTED

Karl Aiken

- (with Pal, A.R. & Perry, G.A.). "Fish nurseries in Kingston Harbour, Jamaica: do they still exist?" 61st Annual Gulf & Caribbean Fisheries Institute Meeting, 10-14 Nov. 2008, Basseterre, Guadeloupe, French West Indies.

Noureddine Benkeblia

- "Determination of respiratory parameters of onion bulbs (*Allium cepa* L.) under total anoxia'. 6th Controlled and Modified Atmosphere Research Conference, April 4-7, 2009 Antalya, Turkey.
- (with Shiomi, N.). "Variation of fructooligosaccharide contents, invertase, 1-KHE, 1-SST, 1-FFT and 6G-FFT activities in green asparagus spears stored at 10oc". 10th International Postharvest Symposium, April 8-12, 2009 Antalya, Turkey.
- (with Kudo, K., Onodera, O., and Shiomi, N.). "Antioxidant properties of peptides isolated from potato protein hydrolysate". 17th Annual Research Conference, November 12-14, 2008, UWI, Kingston Jamaica.

Frederick Boyd

- Gender differences in *Pimenta. Dioica* (L.) Merr. Plant Biology 2009, Joint Annual Meeting of American Society of Plant Biologists & Phycological Society of America July 19-22 Honolulu, HA, (2009).

Jane Cohen

- (with Steen, S., Benkeblia, N.)(2009). Effects of the plant growth regulator, Stimulate TM, on some postharvest qualities of tomato grown in tropical greenhouses. 6th International Postharvest Symposium, ISHS. 8-12 April, Antalya Turkey.

Eric Hyslop

- (with Fender-Longman, A.)(2009). The effect of the invasive snails *Thiara granifera* and *Melanoides tuberculata* on the

endemic *Hemisimus lineolatus* in Jamaica. International symposium of the Freshwater Mollusk Conservation Society, April 19-24 Baltimore USA .

Paula Tennant

- (with Powel, M., Wheatley, A.O., Omoruyi F., Asemota, H. N., Williams, N.P.). “Safety assessment of transgenic crops modified for protection against plant viruses: The papaya case study. Food Safety and Security, the Future”. Knutsford Court Hotel, Kingston, Jamaica, July 30-31, 2009.
- (with Fisher, L.C., & McLaughlin, W.A.). “Detection of Citrus tristeza virus (CTV) in citrus using Serological and Molecular Tools. Food security and agricultural development in the Americas”. Mona Visitor’s Lodge and Conference Centre, University of the West Indies, July 28-30, 2009.
- (with Fisher, L.C., & McLaughlin, W.A.). “New occurrences of Citrus tristeza virus stem pitting strains in Jamaica”. Caribbean Agriculture and Food in a Changing Global Context. University of the West Indies, March 3, 2009.

Dale Webber

- (with Wilmot, I.K.). “Phytoplankton distribution and circulation in Foul and Folly bays St. Thomas on the Southeast Coast of Jamaica”. Association of Marine Laboratories of the Caribbean Conference, May 2009, Dominica.

Mona Webber

- (with Persad, G.). “Modelling trophic interactions in the zooplankton community of Discovery Bay, Jamaica: a new application of Ecopath software”. Association of Marine Labs of the Caribbean Conference. May 2009. Dominica.
- (with Henry, D., and Webber, D.F.) “Sea urchin abundance and distribution in the Port Royal cays area, Jamaica”. Association of Marine Labs of the Caribbean Conference. May 2009. Dominica.
- (with Chin, D., Mendes, J., and Webber, D.F.). “A description of the coral reef community of foul and folly bay, Morant

Wetlands Jamaica”. Association of Marine Laboratories of the Caribbean Conference, May 2009, Dominica.

- (with Harris, N.). Zooplankton as indicators of water quality in foul and folly bays, Morant wetlands area, Jamaica. Association of Marine Laboratories of the Caribbean Conference, May 2009, Dominica.
- (with Foster, A. & Webber, D.F.). “Seagrass distribution in Foul and Folly bays, Morant Wetland, Jamaica”. Association of Marine Laboratories of the Caribbean Conference, May 2009, Dominica.

Byron Wilson

- (with Van Veen, R.). “Taxon report for Jamaican Iguana”, annual meeting of the IUCN Iguana Specialist Group, at White Oak Conservation Centre, Jacksonville, Florida. 2008.
- “Conservation status of Jamaican amphibians and reptiles”. 8th Latin-American Congress of Herpetology. Varadero, Cuba. Pp. 103-104. 2008.

PUBLICATIONS

Refereed Journal Articles

- * **Benkeblia, N.**, Alexopoulos AA, Passam HC. (2008). Physiology and biochemistry regulation of dormancy and sprouting in potato tuber (*Solanum tuberosum* L.) *FOOD* 2: 54-68.
- * Kudo, K., Onodera, S., Takeda, Y., **Benkeblia, N.**, and Shiomi N. (2009). Antioxidative activities of some peptides isolated from hydrolyzed potato protein extract. *Journal of Functional Food* 1: 170-176.
- * Fujishima, M., Furuyama, K., Ishihuro, Y., Onodera, S., Fukushi, E., **Benkeblia, N.**, Shiomi, N. (2009). Isolation and structural analysis in vivo of newly synthesized fructooligosaccharides in onion bulbs tissues (*Allium cepa* L.) during storage. *International Journal of Carbohydrate Chemistry*, 1: 1-9

- * **Benkeblia, N.** and Shiomi, N. (2009). Variation of fructooligosaccharide contents, invertase, 1-SST, 1-FFT and 6G-FFT activities in green asparagus spears stored under different temperature regimes. *Fresh Produce* 3: 44-50.
- * **Benkeblia, N.** (2009). Postharvest biology and technologies of *Allium crops*. In: **N. Benkeblia** (Editor). *Advances in Postharvest Technology for Horticultural Crops*. Vol. 2. Research Signpost Publisher, Kerala, pp. 229-250.
- * Williams, K. T., **Coates-Beckford, P.L.** (2007). Nematodes and fungi associated with roots of *Carica papaya* L. cv. Solo in Jamaica and the influence of plastic mulches on their occurrence and plant vigour. *Tropical Agriculture* (Trinidad) 84:91-103
- * Tennant, P., Robinson, D., Fisher, L., Bennett, S., Hutton, D., **Coates-Beckford, P.L.**, McLaughlin, W. (2009). Diseases and pests of citrus (*Citrus spp.*). In Benkeblia, N., and Tennant, P. (Editors). *Citrus III. Tree and Forestry Science and Biotechnology*, Volume 3 (Special Issue 2). 81-107
- * **Garraway, E.**, Murphy, C.P., and Allen, G. 2009 Pailio demoleus (the Lime Swallowtail) (Lepidoptera: Papilionidae), a potential pest of citrus, expanding its range in the Caribbean. *Tropical Lepidoptera*, 19: 58-58.
- * **Tennant, P.F.**, Robinson, R., Fisher, L., Bennett, S., Hutton, D., Coates-Beckford, P.L., McLaughlin, W. (2009). Diseases and pests of citrus (*Citrus spp.*). Tennant, P.F., Benkeblia, N., (Eds) *Citrus III. Tree and Forestry Science and Biotechnology*, Vol.3, (Special Issue 2). 81-107
- * Chin, M., Rhodes, L., **Tennant, P** (2008) Occurrence of Papaya ringspot virus in papaya orchards of St. Kitts. *Plant Pathology* 57: 767 (New Disease Reports [<http://www.bspp.org.uk/ndr/>] Volume 16.)
- * Powell, M., Wheatley, A., Omoruyi, F., Asemota, H., Williams, N.P., **Tennant, P.F.** (2008) Effects of subchronic exposure to transgenic papayas (*Carica papaya* L.) on liver and kidney enzymes and lipid parameters in rats. *Journal of the Science of Food and Agriculture* 88:2638-2647

- * Roberts, M., Minott, D.A., **Tennant, P.F.**, and Jackson, J.C. (2008) Assessment of compositional changes during ripening of transgenic papaya modified for protection against *Papaya ringspot virus*. *Journal of the Science of Food and Agriculture* 88: 1911-1920
- * Boyd, F., **Tennant, P.F.**, Persad, G, Robinson, D., McLaren, I (2008) Student perceptions and outcomes of a WAC intervention exercise in an introductory biology course. *Caribbean Journal of Education* 30:217-247
- * Campbell, P., Manning, J., **Webber, M.K.**, Webber, D.F. (2008) Planktonic communities as indicators of water quality in Jamaican mangrove lagoons: a case study. *Transitional Waters Bulletin* Vol.3 (2008), 39-63
- * Gribbins, K.M., Rheubert, J.L., Poldemann, E.H., Collier, M.H., **Wilson, B.**, and Wolf, K. 2009. Continuous spermatogenesis and the germ cell development strategy within the testis of the Jamaican Gray Anole, *Anolis lineatopus*. *Theriogenology* 72:484-492.
- * Lewis, D.S., Vogel, P., and **Wilson, B.** 2008. Survival, dispersal, and home range of headstarted Jamaican iguanas, *Cyclura collie*. *Caribbean Journal of Science* 44:423-425.
- * Hailey, A., **Wilson, B.S.**, and Horrocks, J.A. (eds) 2009. Conservation of Caribbean Island Herpetofaunas, Part 5. *Applied Herpetology* 6:103-149.

Technical reports and Non-refereed Articles

- * **Aiken, K.A.**, and Pal, A.R. 2008 "Dolphin interference with fish traps in Jamaican waters". Proc. Gulf & Caribbean Fisheries Instit., Punta Cana, Dominican Republic, Vol.60:269-281, Fort Pierce, Florida, Libr. Of Congress Card Number 52-033783; ISSN Number 1553-8486.
- * **Wilson, B.S** 2008. Battling invasive predators to save the Jamaican iguana. *Aliens of Xamayca* 1:2.

Book Chapters and Editorships

- * **Benkeblia, N.,** and Tennant, P. (Guest Editors) (2008). **Special Issue: Potato I.** *Fruit, Vegetable and Cereal Science and Biotechnology* 2(1), **GSB Publisher**, Isleworth (UK), pp 1-55.
- * **Benkeblia, N.,** and Tennant, P. (Guest Editors) (2008). **Special Issue: Citrus I.** *Tree and forestry Science and Biotechnology*, **GSB Publisher**, Isleworth (UK), 2(1), pp 1-44
- * Tennant, P and **Benkeblia, N.** (Guest Editors) (2009). **Special Issue: Potato II.** *Fruit, Vegetable and Cereal Science and Biotechnology*, **GSB Publisher** (UK, 3(1), pp1-39.
- * Tennant, P and **Benkeblia, N.** (Guest Editors) (2009). **Special Issue: Citrus II.** *Tree and forestry Science and Biotechnology*, **GSB Publisher**, (UK), 3(1), pp 1-169.
- * **Tennant, P.F.,** and Benkeblia, N. (Eds) (2009). **Special Issue Citrus III.** *Tree and Forestry Science and Biotechnology*, Vol., 3 (Special Issue 2), 142 pp.
- * **Benkeblia, N.** (Editor) (2009). *Advances in Postharvest Technology for Horticultural Crops. Vol. 2. Research Signpost Publisher, Kerala, 265 p.*
- * **Robinson, R.D.** (2009). What to look for under the sea. Reprinted under copyright in: Ramsey PA, Harding V, Cools JA and McLaren IA (2009) “Blooming with the pouis: a rhetorical reader for Caribbean tertiary students.” Chapter 20 (pp.95-97). Ian Randall Publishers.
- * Fernandez, E. (2009) “Jamaica. A photographic journey through the land of wood and water.” **Wilson, B** (ed.) IMCA Jamaica Ltd. 336pp.

INCOME GENERATION

Research Funding

EDULINK grant (Dr. Judith Mendes)	E488,000.00
Graduate Awards Funds	(J\$252,831.68

(All Dr. Byron Wilson)

Disney Wildlife Conservation Fund; submitted through IUCN-ISG	(US\$30,000.00)
International Iguana Foundation	(US\$20,000.00)
Environmental Foundation of Jamaica	(J\$200,000.00)
Chelonian Research Foundation Linnaeus Fund with D. Calder	(US\$1,800.00)
Anonymous Donor; submitted through the International Iguana Foundation with R. Hudson.	(US\$15,000.00)

Income from Self-Financed Programmes

Programmes	Income	Expenditure
MSc. PPP	Ja\$1,100,000.00	Ja\$ 642,370.00
Summer school	Ja\$ 6,862,982.00	
Rental and Lab Manuals	Ja\$ 1,657,577.50	
Consultancy	Ja\$ 1,002,900.00	
Other Grants & Donations	Ja\$ 491,777.50	

PUBLIC SERVICE

Dr Karl Aiken

- Member, Board of Directors, Caribbean Maritime Institute, (Chairman, Academic Sub-Committee)
- Member, CITES Scientific Authority, NEPA
- Member, Fisheries Advisory Board, Ministry of Agriculture & Fisheries

Dr. Nouredine Benkeblia

- Member, Editorial Board of several International Journals

- Consultant expert, UNPD (United Nation Programme of Development, Switzerland)
- Consultant, Scientific Advisory Board (USA)

Dr. Jane Cohen

- Member, CITES Scientific Authority of Jamaica
- Member, Alien Invasive Species Working Group of Jamaica
- Member, Jamaican Society for Agricultural Sciences
- Member, Natural History Society of Jamaica

Dr. Eric Garraway

- Member, Advisory Board of the Natural History Division, Institute of Jamaica.2000-2006.
- Advisor/ Point-person, Vincentian Student Association.

Dr. Kurt McLaren

- Member, The Blue and John Crow Mountains National Park Scientific and Technical Advisory Committee

Dr. Judith Mendes

- Institutional Member, Association of Marine Laboratories of the Caribbean
- Member, UNESCO Science Committee – Barbados
- Member, CAS (Jamaica Chapter).

Prof. Ralph Robinson

- Member, Board of Director Jamaica Agricultural Development Foundation
- Member, National *Ad hoc* Committee to Develop Guidelines for the Aquaculture Industry in Jamaica
- Member, National Shrimp Aquaculture Policy Sub-Committee
- Member, Bioethics Society of the English-Speaking Caribbean
- Scientific Member, National Bioethics Committee of Jamaica

Dr. Paula Tennant

- Staff Representative, National Environment & Planning Agency’s Biodiversity Committee

Dr. Kisan Vaidya

- Member, Gene Bank Committee, Jamaica.
- Member, Technical Committee, Jamaica Agricultural Development Foundation (JADF)
- Member, Review Committee (Agriculture related articles) of the *Jamaican Journal of Science and Technology*

Dr. Dale Webber

- Chairman and NGO Member, Board of Directors, Environmental Foundation of Jamaica.
- Council Member, Jamaica Institute of Environmental Professionals (JIEP)
- Chairman, Caribbean Examinations Council (CXC) Panel on Cape Environmental Sciences.
- Reviewer, Elsevier Science Publishing (Environmental Science and Policy)
- Member, National Council on Ocean and Coastal Zone Management (NCOCZM)

Dr. Mona Webber

- Member, National Environmental Education Committee.
- Member, Steering Committee for Sea Turtle Recovery Network,
- Member, Association of Marine Laboratories of the Caribbean.
- Member, Caribbean Academy of Sciences, Jamaican Chapter.
- Member, National RAMSAR committee (NEPA).
- Member, UNESCO National Advisory Committee for Science and Technology
- Member, CITES (Committee for International Trade of Endangered Species).

Dr. Byron Wilson

- Member, Board of Directors, Windsor Research Centre
- Member, Working Group on Invasive Species, (NEPA)
- Invited Member, IUCN SSC Iguana Specialist Group
- Invited Member, IUCN SSC Amphibian Specialist Group

Marcia Creary

- Member, Steering Committee, Caribbean Coastal Marine Productivity programme
- Council Member, Jamaica Institute of Environmental Professionals
- Member, International Society for Reef Studies
- Member, Caribbean Academy of Sciences
- CMS Representative, National Council for Ocean and Coastal Zone Management

Peter Gayle

- Member, Diving sub-group of the working group on Fisheries Management and related matters of the National Council on Oceans and Coastal Zone Management.

Lourene Jones

- Member, Jamaica Blue Flag Jury

Camillo Trench

- Life Sciences/CMS representative of the National RAMSAR Committee (NEPA).
- Member, Communication, Education and Public Awareness (CEPA) sub-committee of National RAMSAR Committee.

CATEGORIES OF STUDENTS

Undergraduate numbers:

Preliminary (Year 0)	–	133
Introductory (Level I)	–	529
Advanced (Level II)	–	159
Advanced (Level III)	–	97

Class of Degrees 2008/2009 Graduates

I	5
II i	15
II ii	31
Pass	11
Total	62

Types of Degrees 2008/2009 Graduates

Botany Major	1
Zoology Major	2
Biology with Education	1
Marine Biology Major	2
Experimental Biology Double Major	9
Environmental Biology Double Major	19
Zoology/Botany Major	1
Zoology/Biochemistry Major	5
Botany/Biochemistry Major	4
Botany/Biotechnology Major	4
Zoology/Biotechnology Major	1
Zoology/Molecular Biology Major	1
Botany Minor/Molecular Biology Major	1
Zoology Minor/Biotechnology Major/ Food Processing Minor	1
Botany Minor/Chemistry Major	1
Botany Minor/Marine Biology Major	1
Chemistry/Zoology Major	1
Physics/Zoology Major	1
Zoology/Geology Major	1
Zoology Major/Computer Science Minor	1
Zoology Major/Psychology Minor	1
Zoology Minor/Computer Science Major	2
Zoology Major/Electronics Major	1
Total	62

Prizes

The following students were formally recognized for quality academic performance.

Preliminary Biology Prize:	Ms. Kamilah Gallow
Introductory Biology Prize:	Mr. Michael Bennett
	Ms. Deidre-Ann Morgan
S. Potluri book award:	Ms. Taneesha Green
D.P. Devi-Prasad book award:	Ms. Staci Lee Peart
Level II Zoology Prize:	Ms. Taneesha Green
L.B. Coke Plant Physiology Prize:	Ms. Keisha McAlpine
Avinash Potluri Prize:	Ms. Deidre-Ann Morgan
Vincent Hugh Wilson McKie Prize:	Ms. Wendy Ann Barton