DEPARTMENT OF LIFE SCIENCES

Dale F. Webber BSc (Hons.) PhD *UWI* – Head of Department

WORK OF THE DEPARTMENT

With each year, new challenges and opportunities arise. The academic year 2005/06 was another challenging year not because of budget cuts as in the previous year, but rather due to an unexpected increase in student numbers and the Department's preparation for an external Quality Assurance Review. As the Department came to the end of its three year strategic plan many of the earlier identified goals and objectives were achieved and realised. New Departmental goals and objectives will emerge from the upcoming review process as a new three-year strategic plan is designed for implementation.

(a) Department's performance during 2005/06

Undergraduate teaching

In response to national and regional needs as well as responding to an indication of interest from students, two new courses in **Coral Reef Biology** and **Medicinal & Economic Botany** were delivered in 2005/06. The regional importance of the Coral Reef Biology course was reinforced when the Cave Hill Campus requested that Life Sciences staff at the Mona Campus deliver of the same course at their campus in the same academic year. Since the satisfaction of regional needs continues to be important to the Department of Life Sciences this request was granted to the satisfaction of both staff and students at Cave Hill. The Medicinal and Economic Botany course was over subscribed and the student assessments suggest strong support and satisfaction with this new but relevant course.

At level 1 the unexpected intake of students resulted in numbers overall increasing by 30% with one course BL10L securing 327 registrations. The increased numbers, while taking its toll on the department's infrastructure, resulted in improved human and material resources which allowed

satisfactory completion of the year and a level of preparedness for the following year. Seventy new microscopes and associated electronic teaching aids were acquired and additional laboratory space was reconfigured. The BL10J course increased from 282 to 287 (2%), BL10L increased from 215 to 327 (52 %), BL10M increased from 185 to 261 (41 %) with the Botany level 2 core increasing by 10 % and the Zoology level 2 core increasing by 5%. Two additional courses became available through the OurVLE platform and thus 20% of courses are available through this medium, with 70% of courses available via departmental network connections.

Graduate training

The core courses sat by all new graduate students were revised to improve the research methodology and statistics in biology for research. The number of MPhil registrations reduced to 58 from 60 while the number of PhD's remained at 18. A new **MSc programme in Aquatic Sciences** was implemented in 2005/06 with 7 fee paying students who have expressed great satisfaction with the programme at the end of the first year. This increased the department's non-UGC MSc programmes to three with the original two MSc programmes in Tropical Ecosystem assessment and Management and Plant Production and Protection being continued. The implications are twofold. First the department now offers taught graduate programmes in three regionally and nationally important areas of Biology and secondly the income generation potential has been increased by 30%.

Research output

The departmental goal of 1.5 referred publications per person in the 2005/06 academic year was not realised, instead the departmental publication rate per person was 0.87 for referred publications and 1.7 when all forms of publication are considered. It was hoped that the reorganized contact teaching hours would have resulted in improved research output but it will take more than one year to realize the improvement sought, especially in Biological Sciences. Importantly, the research output target to have 50% of departmental publications occurring in international journals with impact factor 1.0 was achieved with one publication being in *Science* which has an impact factor of 26.68. Quality of research output is as important as quantity. The final goal of increased relevance of the technical reports and conference presentations was also achieved as the specific recipients (such as JAMALCO, CITES, and IUCN) as well as the wider readership of the Gleaner spans the full range

of relevance from specific technical expertise to general awareness and knowledge empowerment. Moreover, globally important issues such as bioethics, transgenic research and biodiversity issues dominated the non-peer reviewed publications, influencing national and regional thoughts if not policy.

Income Generation

The goal to generate $1.5 million from the three MSc. Programmes was achieved and surpassed in the 2005/06 academic year with an income of over $1.8 million. This was essential to the survival of the department as the UGC budget was exhausted with four months remaining in the academic year. The projected $0.5 M from the 2006 summer school programme was surpassed ten fold and will prove vital in the department's financial survival especially since one income generating MSc. (Tropical Ecosystem Assessment and Management) will not be offered in 2006/07. At present there are fifteen externally funded projects and at least fifty other projects with small grant funds or funded from the Department. .The ratio of 1:5 funded to non-funded projects within the department is below the 1:3 ratio which appears to the norm in many well established biology departments in North America (University of Guelph, University of Toronto, University of South Florida and Duke University), but is well in excess of other Universities in developing countries (University of Botswana). It is also important to note that in 2005/06, these grants together brought in over JA$20 million which is four times greater than the department's operational budget.

(b) Main targets for 2006/07 academic year

Undergraduate programme

To engage the OurVLE as the delivery platform for 50% of courses in the department.

To maintain or improve the high standard of teaching and student centered approach to teaching and learning and continue to secure high student assessment as a department.

To review the majors offered within the Department including the implementation of a major in Marine Biology.

To review and implement recommendations from the Quality Assurance Review especially in curriculum reform, tracking graduates of the

department and methods to establish stronger links with industry and potential employers of our graduates.

Graduate programme

To improve the use and function of the supervisory committees for each student.

To reduce the time taken for completion and improve the quality of the experience of a higher degree.

To continue to answer the questions posed in private and government sectors across Jamaica and the Caribbean by formulating graduate research focused on the identified questions.

To recruit more qualified students into the income generating MSc Programmes.

To review the MSc programmes and streamline the two environmental programmes into one with a core and electives.

Research output

The previous goal of 1.5 referred publications is still widely held to be a reasonable and achievable goal and as such the target for 2006/07 remains at 1.5 referred publications per person. Conference presentations and technical reports should receive less attention from the Department in the upcoming year unless measurable impact on national policy and programmes can be identified. However, the department will continue to encourage graduate students to participate in conferences as we attempt to develop a culture of research.

Income generation

With the reduction in the number of MSc programmes, income generation from the remaining programmes is targeted to reduce to $1.0 million. However, the growth of the summer school programme has indicated a new income stream to which the Department will look to offset its meager operational budget which still stands at less than 5 % of the total budget. Income generation targeted from the 2007 summer school is JA$3.3 million while the income target associated with the grants is JA$20 million.

(c) Overall teaching achievement

Overall teaching was again exceptionally good within the department with all courses being successfully taught, examined, and assessed by students. All lecturers but one scored greater than 3.5 on student assessment with departmental average of 4.27±0.8 (the highest in the Faculty). While this does not reflect an improvement over the 4.31 in 2004/05, it confirms maintenance of a high standard recognized by the Deputy Principal's letter of commendation to the Department. Much was gained by a process for the indication of interest in final year courses by second year students as well as an active student staff liaison committee which met twice per semester. All majors, minors, options and courses have been revised and aims and objectives included for the 2006/07 academic year. Average course satisfaction was rated as good (3.92±0.9) with as many as 66% of students responding. External Examiner reviews and the External Quality Assurance Review suggest satisfaction in course content and delivery but indicate areas for improvement which form portions of the 2006/07 targets.

(d) Research output

In 20005/06 the Department of Life Sciences with 16 current staff was able to produce13 publications in referred journals and a further 4 in government reports and technical papers with 10 conference presentations. This resulted in a 1.7 per capita publication.

PAPERS PRESENTED

- Christensen, V., Villanueva, M.C. & **K.Aiken.** "Ecosystems at risk: the contribution of ecosystem approaches to fisheries to identify problems and evaluate potential solutions". 2006 Conference, Portsmouth, University of Portsmouth, 11-14 July.
- Creary, M. & **M. Webber**. "Mangrove Biodiversity". Institute of Jamaica Natural History Division: Biodiversity Sym- posium. May 22, 2006, Kingston
- **Robinson, R.D.** Research ethics and the responsible conduct of research. 2ndCaribbean Research Ethics Conference, May 18-20, 2006. Kingston, Jamaica.
- **Robinson, R.D**. (2006). The Launch of the Bioethics Society of the English-Speaking Caribbean. **2nd** Caribbean Research Ethics Conference, May 18-20, 2006. Kingston, Jamaica.

- **Robinson, R.D.** (2006). The Bioethics Society of the English-Speaking Caribbean. UNESCO Seminar "Introduction to Bioethics**"** June 8-9, 2006. Port of Spain, Trinidad.
- **Tennant, P**. 2005 Principles underlying the production of transgenic plants. Workshop for Science Teachers: Concepts in Biotechnology and Genetic engineering. December 13, 2005.
- **Tennant, P**. 2005 Principles underlying the production of transgenic animals. Workshop for Science Teachers: Concepts in Biotechnology and Genetic engineering. December 13, 2005.
- **Wilson B.S.** 2006. Biodiversity conservation in the Hellshire Hills. Biodiversity Symposium, Institute of Jamaica, Natural History Division.
- **Wilson B.S.** 2005 Taxon report for Jamaican Iguana, Annual meeting of the IUCN Iguana Specialist Group, on South Andros, Bahamas.
- **Wilson, B. S.**, and R. van Veen. Jamaican Iguana (*Cyclura collei*) Recovery Project, 2005 Update.

PUBLICATIONS

Books and Monographs

* **Garraway, E**. and A. Bailey. 2005. Butterflies of Jamaica. 112 pp. Macmillian, Caribbean

Refereed Journal Articles

* **Aiken, K. A**., G.A. Kong, S. G. Smikle, R. Appeldoorn & G.F. Warner.2006. Managing Jamaica's queen conch resources**.** *Ocean & Coastal Management* 49,332-341, Elsevier Press & Univ. of Delaware, USA.

* Ellis-Tabanor, M. and **E. Hyslop**. 2005 Effect of Sublethal concentrations of Endosulphan on growth and fecundity of two species of snails. *Bull.Environ Contam.Toxicol.*74, 173-1178.

* Forbes W.M., **Robinson R.D**. & Reese, P.B. 2005. Eryngial, a plant compound with marked anthelmintic activity *in vitro* using *Strongyloides stercoralis* L3. American Society of Tropical Medicine and Hygiene**,** Washington, USA, December 11-15, 2005. *The American Journal of Tropical Medicine and Hygiene* **73 (6): 254.**

* **Goodbody, I.** and Linda Cole, 2006. "The Western Atlantic Perophoridae (Ascidiacea) II. The genus *Ecteinascidia". Bulletin of Marine Science* 79 (1) 49-70.

* Jackson, C.P.J. and **Webber, M.K**. 2005. Sponges of the Port Royal mangroves. *Jamaica Journal*. Vol. 29, Nos 1 & 2: 42-49.

* **McLaren, K.P**. and M. McDonald, 2005. Seasonal patterns of flowering and fruiting in a dry tropical forest in Jamaica. *Biotropica.* 37: 584-590.

* **McLaren, K.P**., M. McDonald, J. Healy, and J. Hall. 2005. Predicting species response to disturbance from size class distributions of adults and saplings in a Jamaican tropical dry forest. *Plant Ecology* 181:69-84.

* Mumby, Peter J., Craig P. Dahlgren, Alastair R. Harborne, Carrie V. Kappel, Fiorenza Micheli, Daniel R. Brumbaugh, Katherine E. Holmes, **Judith M. Mendes,** Kenneth Broad, James N. Sanchirico, Kevin Buch, Steve Box, Richard W. Stoffle, Andrew B. Gill 2006 Fishing, Trophic Cascades, and the Process of Grazing on Coral Reefs. *Science* 311:98-102.

* Souza, M., **Tennant**, P., and Gonsalves, D. 2005 Influence of coat protein transgene copy number on resistance in transgenic line 63-1 against *Papaya ringspot virus* isolates. HortScience 40: 2083-2087.

* Waugh C, Shafir S, Wise M, **Robinson R.D.**, Eberhard M & Lindo JF 2005. Transmission of *Angiostrongylus cantonensis* to humans in Jamaica. *Emerging Infectious Diseases* 11(12): 1977-1978.

* Van Veen, R., and **B. Wilson**. 2005. Jamaican Iguana (*Cyclura collei*) Recovery Project, 2004 Update. IGUANA 12:28-29

* **Wilson, B. S**., J. A. Horrocks, and A. Hailey. 2006. Conservation of insular herpetofaunas in the West Indies (Editorial). *Applied Herpetology* 3:181-195.

Technical reports and Non-refereed Articles

* Murray, A.O. & **K.A. Aiken**. 2006. Artisanal fishing in Jamaica today: a study of a larger fishing site. Proc. Gulf & Caribbean Fisheries Institute 57:215-233

* **Aiken, K.A**. 2006. National report – Jamaica. Bruckner, A.W. (editor). Proceedings of the CITES

* Workshop on the conservation of sea cucumbers in the family Holothuriidae and Stichopididae: NOAA Technical Memorandum NMFA-OPR 34, Silver Springs, MD:154-157pp

* **Tennant, P.** 2006, Know your GE ABCs. Eye on Science. *The Gleaner*. Thursday April 20, 2006, pp B8.

* **Garraway E., P. Vogel** and G. Proctor. 2005. Biosurvey of JAMALCO mining areas, Clarendon and Manchester.

INCOME GENERATION

Income from large grants

New Initiative Fund, Assessment of genetic diversity of Citrus tristeza virus and viroids from Jamaica: Towards efficient diagnosis and management of citrus pathogens (2006)

Funds allocated: US$23,000 **Dr. Paula Tennant, Lecturer**

Ministry of Agriculture (Caribbean Development Bank) Citrus replanting project: Pathology of Citrus diseases (2006)

Funds allocated: US$29,000. **Dr. Paula Tennant, Lecturer**

Technology Investment Fund (TIF) Field safety assessment of transgenic papaya expressing the coat protein gene of *Papaya ringspot virus* (2005)

Funds Allocated: JA$1,500,000. **Dr. Paula Tennant, Lecturer**

Environmental Foundation of Jamaica. The Mangroves and Seagrass Beds of Kingston Harbour: Investigation of Sustainability as Nursery Grounds for Fishable Organisms. (2005)

Funds allocated: JA$236,000 **Dr. Karl Aiken, Lecturer**

UWI-New Initiative Fund. The Role of Zooxanthellal phylotype on Skeletal Growth and Density Band Pattern in the Stony Coral "*Monatastraea annuluaris*"

Funds allocated US$5,400 **Dr. Judith Mendes, Lecturer**

UWI-New Initiative Fund. Conservation and Management of Biodiversity in the Forests of Jamaica.

Funds allocated US$13,789 **Dr. Kurt McLaren, Lecturer**

Environmental Foundation of Jamaica grant to conduct research in a pristine coastal environment, The Morant Wetlands St. Thomas Jamaica .

Funds allocated JA$5,100,310 **Drs. Mona Webber, Judith Mendes, Karl Aiken & Dale Webber**

UWI-New Initiative Fund. Reproductive diversity and strategies for breeding in Jamaican Pimento (*Pimenta dioica L.*).

Funds allocated US$20,000 **Mr. Frederick Boyd, Lecturer**

Environmental Foundation of Jamaica – Status and Conservation of Sea Turtles in Jamaica.

Funds allocated JA$4,631,200 **Dr. Byron Wilson, Lecturer**

Jamaica Bauxite Institute – "Vegetation growth on bauxite red mud ponds for return to agricultural activity".

Funds allocated: JA$2,568,800 **Dr Dale Webber, Senior Lecturer**

Total income from large research grants – JA$20,054,784

Income from small grants

Dr. Byron Wilson

2006Conservation International, for Jamaican iguana study ($5000U.S.)

2006 Wildlife Conservation Society, for limestone forest biodiversity study ($5000U.S.; with K. McLaren)

2005 International Iguana Foundation ($9000U.S.)

2005 International Iguana Foundation ($4300U.S.)

2005 Disney Wildlife Conservation Fund; for iguana project ($20,000U.S.)

2005 International Iguana Society (US$5000)

Dr. Judith Mendes

UWI Postgraduate fund. The prevalence of coral diseases in Jamaica. Duration: Sept 2005 – August 2006. US$1,675

Dr. Jane Cohen

$11,136 from Graduate Studies Research Fund (for Peter McLymont's MPhil project).

INCOME FROM SELF-FINANCED PROGRAMMES

		Income	Expenditure
MSc	PPP	Ja$752,640.50	Ja$282,740.97
MSc	TEAM	Ja$ 386,177.60	Ja$359,614.39
MSc	Aquat. Sci.	Ja$706,000.00	Ja$779,310.00
Summer school		Ja$5,245,770.50	Ja$2,386,864.70
Rental		Ja$279,350.00	
Consultancy		Ja$28,140.00	

PUBLIC SERVICE

Dr KA Aiken

- Member, Select Parliamentary Committee on Economy & Production.
- Member, C.I.T.E.S. Scientific Authority, NRCA
- Member, Board of Directors, Caribbean Maritime Institute,
- Member, Board of Directors, Caribbean Coastal Area Management Programme (CCAM)
- Member, Fisheries Advisory Committee of Jamaica, Fisheries Division.

Mr. Frederick Boyd

- External Examiner, Joint Board of Teacher Education (JBTE) in the Institute of Education.

Dr. Jane Cohen

- Member, Alien Invasive Species Working Group

- Member, National Organic Agriculture Steering Committee, Research & Seed Production Sub-Committee
- Member, Education & Research Sub-Committee of the Nature Preservation Foundation
- Member, Consultation Group for Pest Risk Analyses of National Plant Protection Organization

Professor Ivan Goodbody

- Member, Editorial Board of Bulletin of Marine Science.
- Member, Editorial Board of Caribbean Marine Studies.

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

Prof. Ralph Robinson

- Member, Board of Directors, Jamaica Agricultural Development Foundation
- Member, National *Ad hoc* Committee to Develop Guidelines for the Aquaculture Industry in Jamaica
- Member, Ministry of Agriculture Shrimp Aquaculture Policy Sub-Committee
- Chair, Steering Committee, Bioethics Society of the English-Speaking Caribbean
- Executive Secretary, Bioethics Society of the English-Speaking Caribbean

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)

Dr Peter Vogel

- Member, Board, Scientific Authority
- Member, Jamaican Iguana Research and Conservation Group
- Member, Alien Invasive Species Working Group
- Member, IUCN West Indian Iguana Specialist Group
- Member, of Executive Committee and Past President, Bird Life Jamaica
- Member, of Scientific Advisory Committee, Blue and John Crow Mountains National Park
- Member, of Advisory Board, Natural History Division, Institute of Jamaica
- Member, Society of Caribbean Ornithology

Dr. Dale Webber

- Secretary, National Environment Societies Trust (NEST)
- Chairman, CL Environmental Company Limited.
- Member**,** Ministry of Education and Culture Overseas Examination Commission.
- Chairman**,** National committee of RAMSAR international convention on Wetlands.
- External examiner, CASE Environmental Sciences programme.
- Member, Board of Governors of the Mona Preparatory School.

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

Dr. Byron Wilson

– Chairman, Jamaican Iguana Research and Conservation Group

– Member, Board of Directors, Windsor Research Centre

– Member, Working Group on Invasive Species, (NEPA)

CATEGORIES OF STUDENTS

Undergraduate numbers:

Preliminary (Year 0) – 134 (66 registered in community colleges),
Introductory (Level I) – 327
Advanced (Level II) – 92
Advanced (Level III) – 68

Of the 68 final year students, 58 completed graduation requirements with the following distribution in performance.

First class Honours – 4
Upper second Honours – 27
Lower second Honours – 25
Pass – 2

The majors selected and completed within the Department were:

Botany – 14
Biology with Education – 3
Environmental Biology – 14
Experimental Biology – 3
Microbiology – 5
Zoology – 22

Postgraduate	**2005/06 registrations**	**2005/06 completions**
MSc Tropical Ecosystem Assessment and Management	21	4
MSc Plant production and protection	7	–
MSc Aquatic Sciences	7	–
MPhil	58	5
PhD	20	2

Prizes

The following students were formally recognized for quality academic performance.

Preliminary Biology	**Tanika Robinson**
Introductory Biology	**Taja Francis and Haile Dennis**
Level II Zoology	**Kayann Nelson**

L.B. Coke Plant Physiology Prize **Fiona Downs**

Awards

Dr. Byron Wilson

- 2006 Principal's Research Award for the Best Publication, Faculty of Pure and Applied Sciences, UWI, Mona, Research Day 2006.

Professor Ralph Robinson

- 2006 Recipient, Principal's Award for the Most Outstanding Project in the Faculty of Pure and Applied Sciences UWI Mona Research Day 2006.