

**University of North Alabama**  
**Department of Biology Program Review**  
**2004-2009**

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Dr. Paul D. Kittle

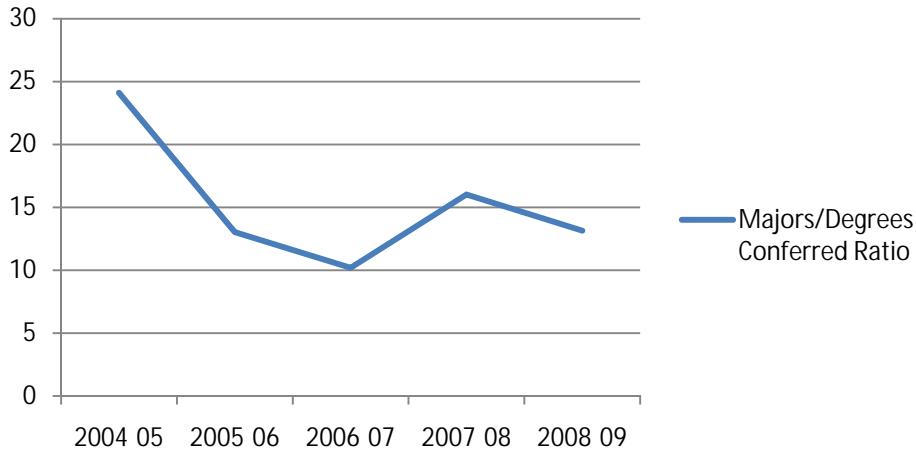
July 26, 2010





### 3. Majors/Degrees Conferred Ratio: 15.3

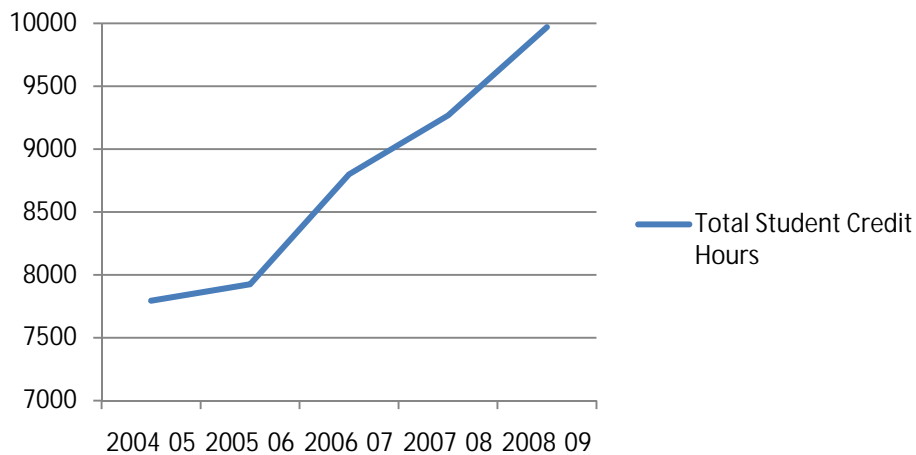
#### Majors/Degrees Conferred Ratio



This ratio dropped significantly from its peak in 2004-2005 and appears to have more or less leveled off.

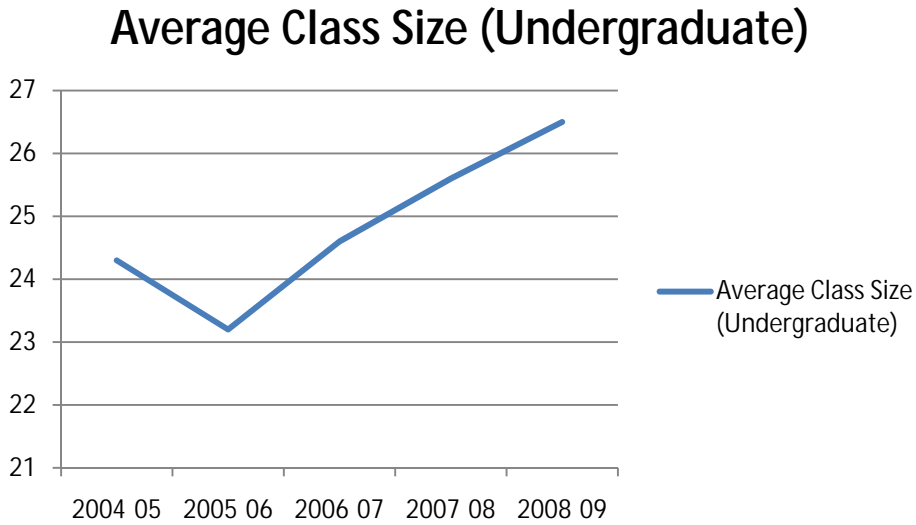
**4. Student Credit Hours:**    **8,707** (undergraduate)  
   **44** (graduate)  
   **8,752** (total)

#### Total Student Credit Hours



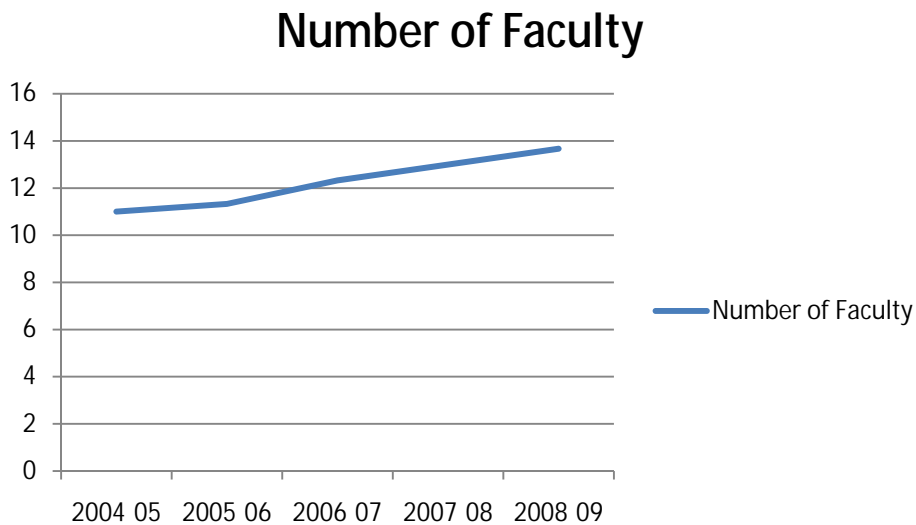
The total number of student credit hours showed a steady increase over the five-year data period.

**5. Average Class Size:**      **24.8** (undergraduate)  
   **2.7** (graduate)



Average class size generally increased during the five-year data period.

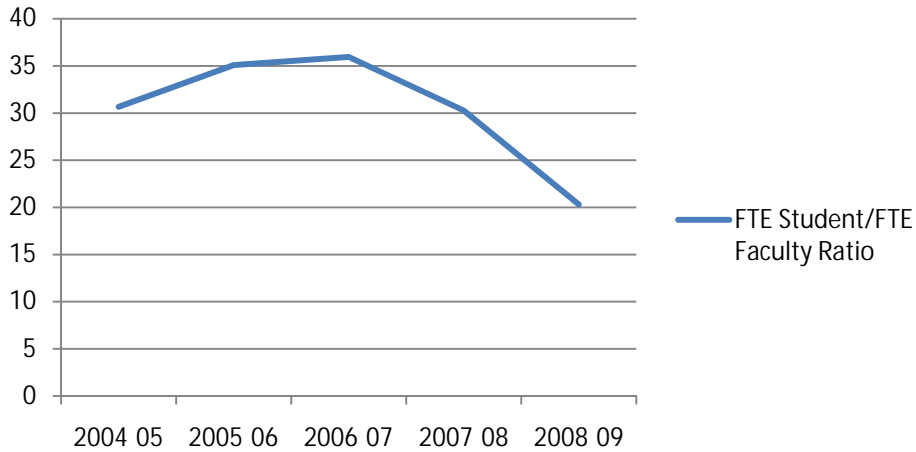
**6. Number of Faculty (Fall Semester): 12.27**



The increase in faculty is explained primarily by the net gain of two additional faculty members during the five-year data period.

## 7. FTE Student/FTE Faculty Ratio: 30.46

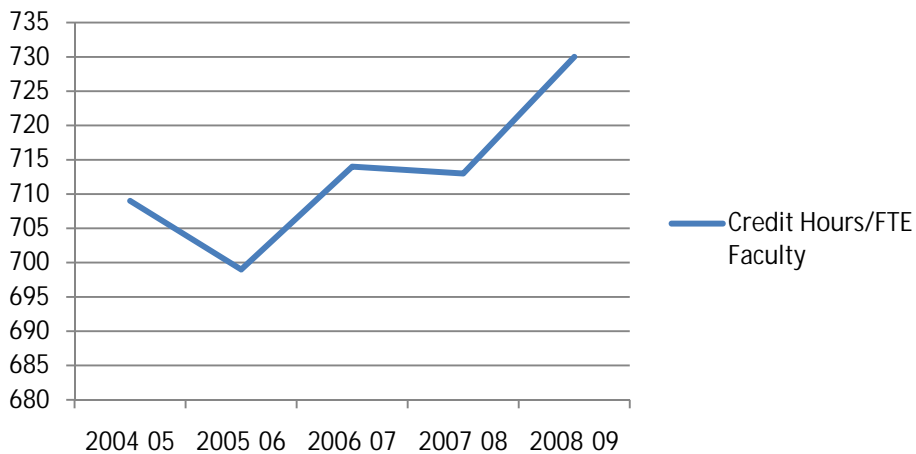
### FTE Student/FTE Faculty Ratio



This ratio declined significantly during the last two years of the data period. Two faculty positions were added (increasing the denominator) and the number of unduplicated majors declined significantly (decreasing the numerator).

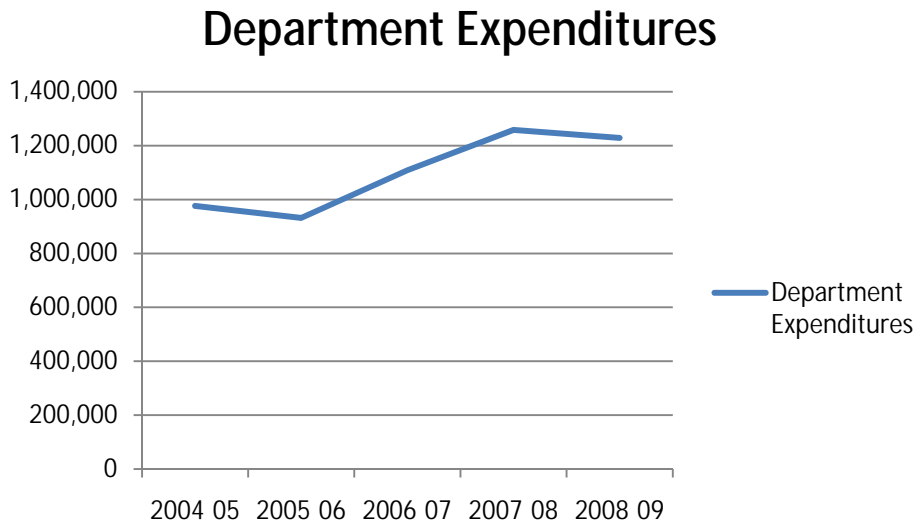
## 8. Credit Hours/FTE Faculty: 713

### Credit Hours/FTE Faculty



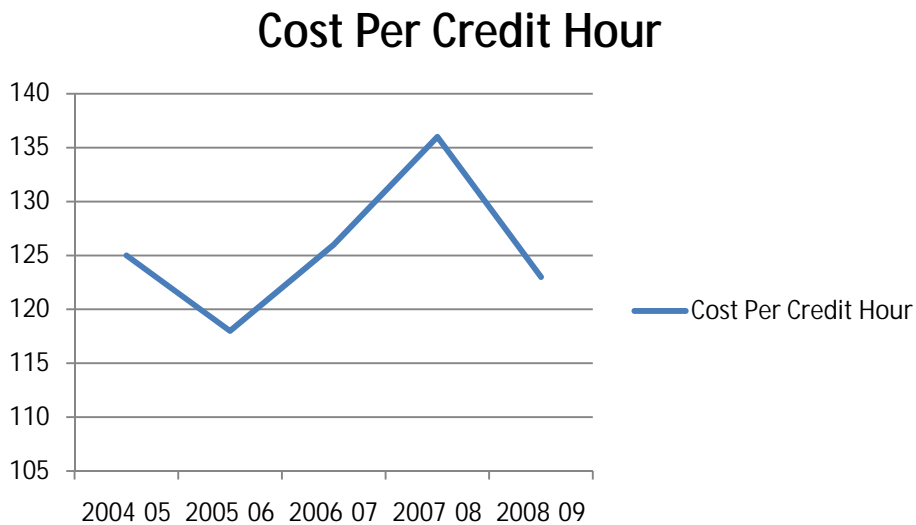
The number of credit hours produced per faculty member showed a general increase over the five-year data period.

### 9. Department Expenditures: \$1,101,019



Department expenditures generally increased, primarily because of the addition of two faculty positions.

### 10. Cost Per Credit Hour: \$126

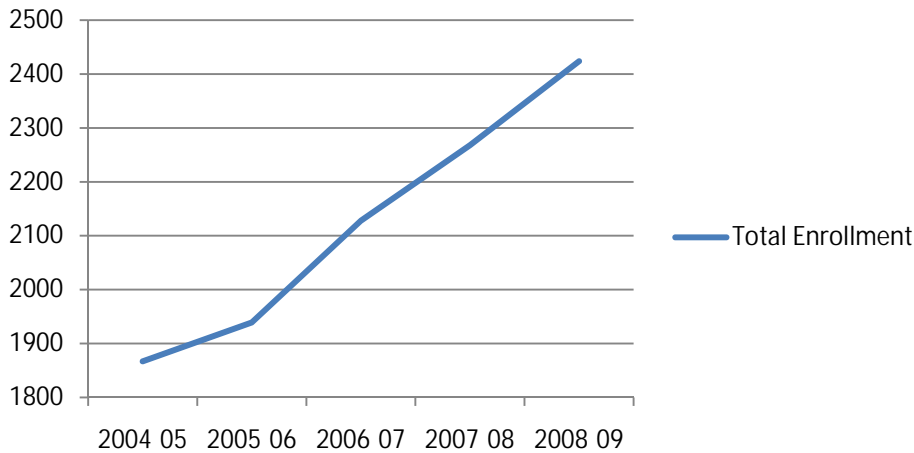


Changes in the number of credit hours produced each year, in combination with changes in the number of personnel (cost), produced significant variation from year to year and no discernible trend.





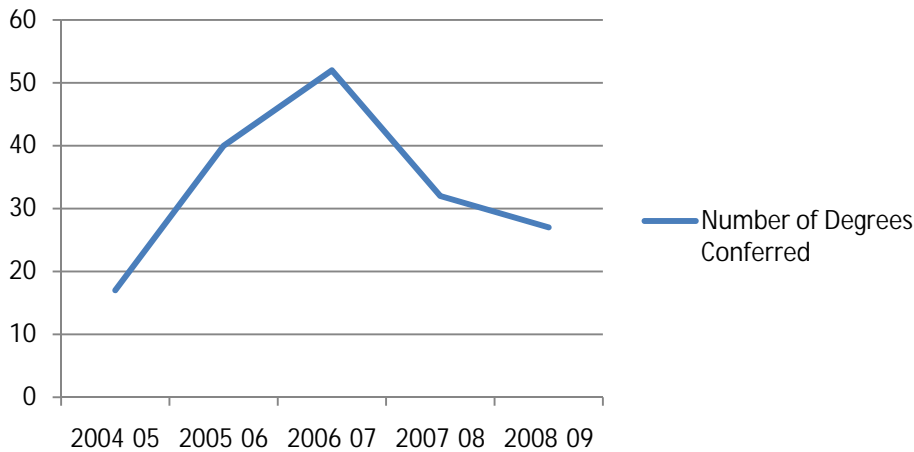
## Total Enrollment



### *Degree Productivity*

The number of degrees conferred increased markedly in the middle of the five-year period.

## Number of Degrees Conferred



An examination of the number of Major Field Test examinees (graduating seniors) during a 17-year period (including the period under consideration) hints that this spike in number of degrees conferred was not unusual, and a satisfactory explanation for the high variation in number of graduating seniors is elusive. [While the number of MFT examinees and the number of degrees conferred are not identical, they are closely correlated.]

### *Student Services*

The Beta Zeta Chapter of Beta Beta Beta, national biology honor society, is an active organization that encourages participation by students. Meetings are held monthly, and several speakers are scheduled each year. Speakers include students and faculty who present the results of their research, as well as speaker from off-campus who present programs on various biology-related topics. The chapter actively fund raises to support scholarships and to defray expenses of members who choose to attend the regional or national meetings of Beta Beta Beta. The chapter has a table at UNA Preview Day to publicize its activities.

The department encourages students to engage in research and present the results at meetings such as those of the Alabama Ant encouis at

professions schools such as medicine, dentistry, optometry, podiatry, pharmacy, and physical

***What biology courses, if any, would you have liked to have taken but did not because they did not fit into your schedule or program?***

As might be expected, most of our courses were listed by at least one student over this five-year period. For those courses that were most often listed, an effort has been made (given the constraints of limited resources) to offer them more often, even though this effort was only recently made or is still planned. During the period, one of the courses often listed (Biochemistry) was scheduled on an annual (rather than biennial) basis. Immunology (another often listed course) will be scheduled on an annual (rather than biennial) basis beginning next year. Histology (also often listed) will be taught during the fall rather than during the summer.

***Please comment on any courses that were particularly excellent or particularly poor.***

All of these comments are shared with the responsible instructors, and the vast majority of these comments are highly favorable).

***What do you see as specific strengths of the biology department?***

Most comments cite the faculty as the main strength, specifically their knowledge, dedication to teaching, caring attitude, one-on-one interaction, *etc.*

***What do you see as specific weaknesses of the biology department?***

A wide variety of comments was received, with many focusing on the poor facility

All instructors use PowerPoint to present lectures, and find this software particularly useful in projecting images.

Most instructors for BI 101 and BI 102 have tried to incorporate “current events” relevant to biology in their lectures as a way of stimulating interest and discussion among these non-majors students. This same practice is followed in many other courses.

Several instructors have incorporated frequent quizzes in their lectures as a way to motivate students to keep up with the material and to attend regularly.

In BI 101, Introductory Biology (for non-majors), Dr. Terry Richardson has added a special topic scrapbook assignment that allows students to investigate a given biology topic of their choosing and interest using readily available sources (Internet, magazines, newspaper, *etc.*). Dr. Richardson found that this project does help to increase student interest in biology.

In his Non-Vascular Plants course, Dr. Paul Davison has developed several inquiry based laboratory activities that serve to develop student laboratory skills in microtechniques that involve learning culture protocols, use of the Baermann Pan for extraction of microorganisms, and a microaquarium for observation of organisms. These skills have enabled students to successfully observe micro-diversity of organisms from various habitats and to explore the ecological occurrence of selected organisms.

In her BI 305, Cell Biology lecture classes, Dr. Amy Crews often assigns problem sets to small groups as an alternative method of instruction. These small groups are expected to discuss and answer questions related to a particular lecture topic.

Dr. Glenn Marvin has incorporated iWorx animal/human physiology teaching kits for data collection and analysis in his Animal Physiology laboratory.

**Publications in peer-reviewed journals**

**Publications in peer-reviewed journals:** (cont.)

Hentschel, J., **P.G. Davison**, and J. Heinrichs. 2008. *Porella gracillima* Mitt. (Jungermanniidae, Porellaceae) in Tennessee, with an illustrated key to the *Porella* Species of North America north of Mexico. *Fieldiana: Botany, New Series* 47:183-191.

**Ray, J.M.**, N.J. Lang, R.M. Wood, and R.L. Mayden. 2008. History repeated: recent and historical mitochondrial introgression between the current darter *Etheostoma uniporum* and rainbow darter *Etheostoma caeruleum* (Teleostei: Percidae). *Journal of Fish Biology* 72(2):418-434.

**Richardson, T.D.**, and J. Selby. 2009. Downstream Intrabasin Range Extension for the Endangered Plicate Rocksnail, *Leptoxis plicata* (Conrad) (Gastropoda: Pleuroceridae). *Southeastern Naturalist* 8(1):182-184.

**Other publications and reports:** (cont.)

**Haggerty, T.M.** 2004. Common Raven, *Corvus corax*. Pp. 104-105 in R.E. Mirarchi, M.A. Bailey, T.M. Haggerty, and T.L. Best, eds. *Alabama Wildlife, Volume 3*. Imperiled amphibians, reptiles, birds, and mammals. University of Alabama Press, Tuscaloosa. 225 pp.

**Haggerty, T.M.**



**Other publications and reports:** (cont.)

**Davison, P.G., and P.D. Kittle.** 2004. A micro-aquarium for the culture and examination of aquatic life. *Southeastern Biology* 51:152-153.

**Davison, P.G., and P.D. Kittle.** 2005. A reliable method for observing the protrusible pharynx in planarians. *Southeastern Biology* 52:170-171.

**Haggerty, T.M., and G.D. Jackson.** 2005. Cullman County summer bird count- 2004. *Alabama Birdlife* 51:14-21.

Miller, N.G., and **P.G. Davison.** 2006. The American Bryological and Lichenological Society moss and hepatic exchanges: welcome new participants. *Evansia* 23:45-47.

Hudson, K.M., and **T.M. Haggerty.** 2006. The status and distribution of breeding Bald Eagles (*Haliaeetus leucocephalus*) in Alabama, 1985-2006. *Alabama Birdlife* 52:1-8.

**Davison, P.G.** 2006. Feeding water bears: a simple activity to connect the public with microorganisms. *Southeastern Biology* 53.

**Davison, P.G.** 2007. The bryophytes. In on-line *Encyclopedia of Alabama*  
<http://eoa.auburn.edu/face/Article.jsp?id=h-1314>.

**Haggerty, T.M.** 2007. The birds. In on-line *Encyclopedia of Alabama*  
<http://eoa.auburn.edu/face/Article.jsp?id=h-1284>.

Jackson, G.D., and **T.M. Haggerty.** 2007. Summer bird count in southern Piedmont ecoregions of Alabama- 2005. *Alabama Birdlife* 53:4-11.

**Davison, P.G., and M.J. Pistrang.** 2008. A Trailside Guide to Mosses and Liverworts of the Cherokee National Forest. 113 p. Published by the authors using Blurb Inc.

**Davison, P.G., H.W. Robison, N. Van Steenkister, and T. Artois.** 2008. Microturbellarians- an addition to the limnoterrestrial fauna of mossy tree trunks. *Southeastern Biology* 55.

Richardson, C., A.C. Risk, and **P.G. Davison.** 2009. Epiphytic (2009) and Epiphytic (2009) Nipha (2009-00  
eenknd:andGu(Ch2(inatLicheno00512(869)son2005DvDrplifeD1Tf/TT4P1C1Tt\*0002 TjMary S

**Other publications and reports:** (cont.)

Rose, S.D., H.E. Horne, and **T.M. Haggerty**. 2009. Unidentifiable sapsucker (*Sphyrapicus*) in Huntsville, Alabama. *Alabama Birdlife* 55:1-7.

**Haggerty, T.M.** (editor), Alabama Breeding Bird Atlas 2000-2006 Homepage, 22 January 2009, Alabama Ornithological Society. Available from:  
<http://www.una.edu/faculty/thaggerty/BBA%20Homepage.htm>.

**Kittle, Paul D.**, Greg D. Jackson, and Robert A. Duncan. 2004-2009. Twenty seasonal (spring, summer, fall, winter) sightings articles that were published in *Alabama Birdlife*, the journal of the Alabama Ornithological Society.

**Other scholarly activities:**

Dr. Robert Daly

- Maintained an active bird (especially hummingbird) banding program during the five-year period.
- Completed numerous environmental impact studies as a consultant for a variety of business and governmental entities during the five-year period.
- Provided data for the Breeding Bird Survey of the U.S. Fish and Wildlife Service by completing several routes during the five-year period.

Dr. Paul Davison

- Presented an interactive display, “A microaquarium to discover life,” at the All Taxa Biodiversity Inventory Annual Conference, Gatlinburg, Tenn., in 2004 and 2005.
- Made the invited presentation “Conserving rare bryophytes” at the 35th Annual Natural Areas Conference, Nashville, Tenn., 2008.
- Oral presentation, “Microturbellarians: an addition to the limnoterrestrial fauna of mossy tree trunks,” at the Association of Southeastern Biologists meeting in Spartanburg, South Carolina, 2008.
- Presented an invited seminar at Harvard University Herbaria entitled “Phytotelmata of Temperate Tree Trunks: Microwildernesses in Temporary Waters,” 2008.
- Along with Dr. Glenn Marvin and undergraduate student Edward Monson II, presented a poster entitled “Prey Choice and Egg Production in a Bryophilous, Limnoterrestrial Microturbellarian from Northwest Alabama” at the Association of Southeastern Biologists meeting in Birmingham, 2009.
- Coauthor of the presentation “Epiphyllous Liverworts in the Cumberland Plateau of Kentucky and Tennessee” at the Association of Southeastern Biologists meeting in Birmingham, 2009.



Dr. Paul Kittle (cont.)

- Participated in a point count survey for breeding birds at Key Cave National Wildlife Refuge, 2005.
- Participant in a summer bird count in Lawrence County, Ala., sponsored by the Alabama Ornithological Society, 2008.
- Conducted annual nightjar surveys in Bankhead National Forest for the Center for Conservation Biology, 2008 and 2009.

Dr. Glenn Marvin

- Along with undergraduate student Kaitlin Curl, presented the paper “Aquatic and Terrestrial Burst Speeds in a Semi-aquatic Salamander (*Desmognathus quadramaculatus*)” at the Association of Southeastern Biologists meeting in Birmingham, 2009.
- Along with Dr. Paul Davison and undergraduate student Edward Monson II, presented a poster entitled “Prey Choice and Egg Production in a Bryophilous, Limnoterrestrial Microturbellarian from Northwest Alabama” at the Association of Southeastern Biologists meeting in Birmingham, 2009.

Dr. Francis Menapace

- Collected and curated hundreds of plant specimens, 2004-2009.

Dr. Jeffery Ray

- Presented the poster “Population Genetic Comparisons among the River Sturgeons of Central Asia (*Pseudoscaphirhynchus*) and North America (*Scaphirhynchus*)” at the *Desmognathus quadramaculatus*

Dr. Donald Roush

- Reviewed two papers submitted to *BIOS*, national undergraduate journal of Beta Beta Beta.

*Service, including service to public schools*

All faculty served on various departmental, college, and university committees and advised students during the five-year period.

Ms. Evelyn Bruce

- Participated in community outreach with the Shoals PAWS (Pets Are Worth Saving) organization.
- As part of the Master Gardener program, provided volunteer work for the Alabama Cooperative Extension Service.
- Served as coordinator of laboratories for BI 101 and BI 111 and maintained the department's greenhouse, 2004-2009.

Dr. Amy Crews

- Pre-school Sunday School program at First United Methodist Church, Florence (coordinator, teacher), 2004-2005.
- Member of First United Methodist Church committees (Council on Ministries, Administrative Board, Children's Council), 2004-2008.
- Lead Brownie Troop 283 from Kilby School in earning two of its Try-It Badges (Playing Games Around the World and Plants), November, 2005.
- Member of the Kilby PTO Executive Committee, 2005-2008.
- Head room parent for Kilby School fourth grade class, 2006-2007.
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Dr. Robert Daly (cont.)

- Demonstrated hummingbird banding to the Muscle Shoals Chapter of the Alabama Wildflower Society, 2006-2008.
- Conducted a bird banding demonstration for Boy Scouts in Athens, Ga., 2006.
- Presented a program on natural history aspects of the Inland Passage route in British Columbia and southeastern Alaska to the Shoals Wildflower Society, 2007.
- Served as a science fair judge for the 4-H program administered by the Lauderdale County (Ala.) Extension Office, 2008.

Dr. Paul Davison

- Served as subject editor for *Castanea*, the journal of the Southern Appalachian Botanical Society, 2004-2008.
- Director of the Hepatic Exchange for the American Bryological and Lichenological Society, 2004-2009.
- Tennessee Rare Plants Scientific Advisory Committee, 2004-2009.
- Presented a program on the biology of freshwater crustaceans to the fourth grade class at St. Joseph's Regional Catholic School, Florence, 2005.
- Field trip leader at the Great Smoky Mountains Wildflower Pilgrimage in Gatlinburg, Tenn., 2005, 2006, and 2009.
- Participant in the Walls of Jericho (Ala.) Bioblitz sponsored by the Alabama Department of Conservation and Natural Resources, 2005.
- Leader of an environmental education workshop at the Camp McDowell Environmental Center near Nauvoo, Ala., 2005.
- Presented a workshop entitled "Bugs, Worms,

Dr. Paul Davison (cont.)

- Served as an invited panelist speaker during a national recreation forum, “Connecting Youth with the Outdoors,” hosted by the American Recreation Coalition, the USDA Forest Service, and partners in Marietta, Ga., 2007.
- Presented a program on “Mosses and Microscopic Life” to the Shoals Area Master Gardeners, Florence, 2007.
- Led a nature hike for the public at Shoal Creek Preserve (Ala.) that was sponsored by the Alabama Department of Conservation & Natural Resources State Lands Division, 2007.
- Presented a workshop, “Mosses and Liverworts with a Hand Lens,” at the Audubon Mountain Workshop in Mentone, Ala., 2007.
- Led an AMSTI teacher workshop field trip to the Dismals Wonder Gardens in Franklin County, Ala., 2007.
- Presented a program on micro-organisms for the Madison County (Ala.) Soil and Water Conservation District Environmental Education Teacher Workshop, 2007.
- Presented a MicroAquarium workshop for summer camp youth at the Children’s Museum of the Shoals, 2007.
- Presented for public viewing “An Evening at the Microscope,” a live, high definition video display of micro-communities that was sponsored by Alabama Outdoors and the UNA Department of Biology, 2007 and 2008.
- Field trip leader for the Alabama Wildflower Society to Cane Creek Canyon Nature Preserve in Colbert County, Ala., 2007.
- Presented a workshop entitled “Microwildernesses in Forests and Streams: Methods to Reveal Extraordinary Life” at the annual meeting of the Environmental Education Association of Alabama held in Conecuh National Forest, Ala., 2008.
- Elected to the board of th

Dr. Thomas Haggerty

- A principal coordinator of efforts to establish and maintain the Hall Memorial Garden on the Muscle Shoals TVA Reservation and to place memorial benches along the walking trail, 2004-2009.
- Northwest Alabama data coordinator for the Alabama Breeding Bird Atlas, 2004-2006.
- Participant in the fall bird count on the Muscle Shoals TVA Reservation, 2004.
- Participant in the spring bird count on the Muscle Shoals TVA Reservation, 2005.
- Participant in the winter bird count on the Muscle Shoals TVA Reservation, 2005
- Field trip leader to Wilson and Wheeler dams (Ala.) to observe gulls and other waterbirds for the Shoals Audubon Society, 2007.
- Editor of the Alabama Breeding Bird Atlas Project, 2008-2009.

Dr. Tina Hubler

- Construction volunteer for Shoals Habitat for Humanity, 2007.
- Chair, Department of Biology Faculty Search Committee, 2007.
- General Education Assessment Advisory Committee, UNA, 2007-2009.
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Dr. Paul Kittle (cont.)

- Participant in the winter bird count on the Muscle Shoals TVA Reservation, 2005.
- Field trip leader for Eagle Weekend sponsored by Joe Wheeler State Park, 2005.
- Judge for the High School Scholar's Bowl competition sponsored by the Colbert County School System, 2005.
- Northwest Alabama field coordinator for the Alabama Breeding Bird Atlas, 2004-2006.
- Associate editor of *Alabama Birdlife*, the journal of the Alab

Dr. Glenn Marvin

- Reviewed several manuscripts for a variety of scientific journals, 2004-2009.
- BI 101 Laboratory Manual Committee, UNA, 2008-2009.
- Presented “Avoidance of alarm chemicals by salamanders” to UNA’s chapter of Beta Beta Beta, national biology honor society, 2009.

Dr. Francis Menapace

- Participant in an annual quail covey survey at Key Cave National Wildlife Refuge, Florence, 2004-2009.
- Volunteer in the Hall Memorial Native Plant Garden, Muscle Shoals TVA Reservation, 2004-2009.
- Participant in the annual Waterloo (Ala.) Christmas Bird Count, 2004-2009.
- Participant in an annual Birdathon fundraiser for the Shoals Audubon Society, 2004-2009.
- UNA Research Committee, 2004-2006.
- Participant in the fall bird count on the Muscle Shoals TVA Reservation, 2004.
- Faculty Senate representative for Department of Biology, 2004.
- Participant in the spring bird count on the Muscle Shoals TVA Reservation, 2005.
- Participant in the winter bird count on the Muscle Shoals TVA Reservation, 2005.
- Department of Biology Faculty Search Committee, 2006.
- Department of Biology Faculty Search Committee, 2008.

Dr. Jeffery Ray

Dr. Terry Richardson (cont.)

- Appointed as Membership Officer of the Association of Southeastern Biologists and was nominated for President-elect of the Association in 2008.
- Served as Vice Chair of the UNA Shared Governance Executive Committee, 2008-2009.

Dr. Donald Roush

- Considerable service activity was given to Beta Beta Beta, national biology honor society, 2004-2009. Dr. Roush served as the faculty advisor to the UNA chapter (Beta Zeta) during this period. He served as Southeast District Director from 2004-2008, and was elected president of the national organization in 2008. Duties at the district and national levels included traveling to various campuses across the Southeast to install new local chapters, organizing the annual district meetings held in conjunction with the Association of Southeastern Biologists, and attending and organizing annual national meetings.
- Served as a mentor for Jennifer Taylor, a student at Florence High School, who continued her research on bacterial resistance, 2004-2005.
- Conducted two days of workshops for the Biology Science in Motion program in 2007.
- Served as a member at large on the executive committee of the Association of Southeastern Biologists, 2006-2009.

***Faculty development***

All faculty maintained membership in at least one professional organization, and most faculty attended at least one professional meeting during the five-year period.

The department subscribes to and circulates among the faculty the following publications that are used to remain current with issues, research, and teaching in biology and higher education: *Current Contents*, *American Biology Teacher*, *The Chronicle of Higher Education*, *Science News*, and *Southeastern Naturalist*.

Dr. Amy Crews

- Attended two meetings of the North Alabama Health Education Consortium in 2004-2005
- Attended a Pre-Medical Advisors Seminar sponsored by the University of Alabama Birmingham- Huntsville Regional Medical Campus in 2005.
- Attended the spring meeting of the Alabama Health Professions Partnership in Boaz, Alabama, in 2005.
- Attended the annual meeting of the Alabama Health Professions Advisors meeting in Auburn in 2006.
- Attended a workshop on medical school admissions at the University of Alabama- Huntsville Regional Medical Campus in 2006.
- Attended a pre-medical admissions seminar at the UAB-Huntsville Medical Campus in 2007.

Dr. Amy Crews (cont.)

- Attended the statewide meeting of Alabama Health Professions Advisors at the University of Alabama-Birmingham in 2007.
- Attended the annual meeting of the Alabama Health Professions Advisors in Birmingham in 2008.
- Attended a seminar for medical school admissions at the University of Alabama Birmingham-Huntsville Regional Medical Campus in 2008.
- Attended the biennial meeting of the National Association of Advisors for the Health Professions in Chicago in 2008, and was selected to chair the committee that chooses presentations for the regional meeting of the Southeast Association of Advisors to the Health Professions in Birmingham in 2009.
- Attended the statewide Alabama Health Professions Advisors meeting at Troy University in 2009.
- Attended the regional meeting of the Southeastern Association of Advisors to the Health Professions in Birmingham in 2009, where she attended the Board of Directors meeting and was on the program committee for the breakout sessions. Dr. Crews was one of eight advisors chosen from the region to participate in a Focus Group on the future of the National Association of Advisors to the Health Professions.
- Made considerable progress toward the completion of a Master's degree in Community Counseling to help improve her advising and counseling skills.

Dr. Paul Davison

- Attended the 8<sup>th</sup> Annual All Taxa Biodiversity Inventory Conference for the Great

Dr. Jeffery Ray

- Attended the Association of Southeastern Biologists meeting in Birmingham, 2009.

Dr. Terry Richardson

- Attended the Association of Southeastern Biologists meeting in Florence, Ala., 2005.
- Attended a freshman textbook author workshop, sponsored by Thompson Publishing Co., San Diego, 2005.
- Attended the Association of Southeastern Biologists Meeting in Gatlinburg, Tenn., 2006.
- Attended the Association of Southeastern Biologists meeting in Columbia, S.C., 2007.
- Invited to become a member of the Oxford Round Table and attended the meeting at St. Anne's College, University of Oxford, England in 2007. The topic of the Round Table was "Global Climate Change: Managing a Crisis and Sustainable Development."
- Attended the Association of Southeastern Biologists meeting in Spartanburg, S.C., 2008.
- Attended a freshman textbook author workshop, sponsored by Cengage Publishing Co., San Francisco, 2008.
- Attended the Association of Southeastern Biologists meeting in Birmingham, 2009.

Dr. Donald Roush

- Attended the Association of Southeastern Biologists meeting in Florence, Ala., 2005 where he attended a workshop on the BioLog System for identification of microorganisms used in the laboratory.
- Attended the Association of Southeastern Biologists Meeting in Gatlinburg, Tenn., 2006.
- Attended the Association of Southeastern Biologists meeting in Columbia, S.C., 2007, where he attended a workshop on the teaching of .5(h)10mg8cws0oj-i of . Asrgmg81.04 0 TD.0004 Tc-.0

botany laboratory have improved the situation. We have a single small (seven computers) computer laboratory that is inadequate for a department with 300+ majors.

### *Equipment*

During the five-year period, the department was able to purchase a significant amount of equipment from special funds provided by the University and from its own budget. A new autoclave was the most expensive (~\$60,000) item purchased. Additional equipment is needed to support the new Option in Cellular and Molecular Biology, and the department is still struggling to accomplish this two+ years after the addition of this option to the curriculum. While the department does have significant equipment, a shortage of some items too often forces students to share equipment in laboratories, preventing them from having a “hands-on” laboratory experience.

While the University provided adequate computer equipment during the first part of this five-year period, replacement of aging computers slowed considerably during the latter part.

### *Space*

Lack of sufficient space is a major problem for this department, and this problem extends to lecture rooms, teaching and research laboratories, storage/preparation areas, and offices. The space that was probably quite adequate for this department when Floyd Hall was constructed in 1964 is today woefully inadequate. The Department of Chemistry and Industrial Hygiene has approximately the same amount of space in Floyd Hall as does the Department of Biology, but Biology has nearly two and one-half times as many students and almost twice as many faculty as does Chemistry and Industrial Hygiene. Flexibility in the scheduling of classes is complicated by the fact that the department has only three lecture rooms and nine laboratories. Research space is extremely limited given the number of faculty. Storage/preparation areas are very limited, with some having been converted to other uses. While about half of faculty offices are adequate in size, many others are far too small or poorly designed. Poor ventilation and climate control, as well as leaks of various kinds, plague nearly all of the spaces in Floyd Hall. The only real solution to this space problem is construction of a new building that provides space to the various science programs in approximate proportion to their size and needs.

### *Support personnel*

A single administrative assistant is provided to the department, and while this person does an excellent job, the work load is too much for one person. Biology has the largest supplies budget of any academic department at UNA, and this fact creates a tremendous work load in the form of preparing purchase requests, placing orders, processing received materials, and following up on all kinds of issues generated by these purchases. The large number of faculty members and students in the department also contributes to the work load. Each of the other science departments is less than half as large as Biology, yet each is also given one administrative assistant. The argument is not to reduce the level of support given to those departments, but rather to increase the level of support given to this department. The chair has

not requested additional support personnel because such an effort would be fruitless given recent and current budgetary climates.

The department employs four-five student workers who assist in the preparation and cleaning of laboratories and routine office tasks.

**6. List any notable achievements by the department.**

Dr. Paul Davison (cont.)

- National Forest Service, 2005-2008, production of a photographic guide to common bryophytes found in Cherokee National Forest, \$5,000.
- National Forest Service, 2007, identification of bryophytes from the Chattooga River Basin in North Carolina, South Carolina, and Georgia, \$2,500.

Dr. Thomas Haggerty

- U.S. Fish and Wildlife Service, 2006-2007, water quality investigation and status survey of the armored snail and slender *Campeloma* in Alabama, \$10,350.

Dr. Tina Hubler

University of North Alabama, 2006-2009, three research grants to conduct molecular biology research.

Dr. Jeffery Ray

University of North Alabama, 2008-2009, status survey and abundance of the crystal darter in the Meramec River system, \$1,820.

Dr. Terry Richardson

University of North Alabama, 2007-2008, three research grants for studies on the foraging ecology of the Caribbean spiny lobster, \$8,800.

*Other awards and distinctions*

Dr. Donald Roush was selected for inclusion in *Who's Who Among American Teachers* for 2004-2005.

Dr. Crews was initiated into Chi Sigma Iota, the honor society for counseling students in 2009.

**7. How has the department responded to previous program review recommendations?**

The department has not had a previous program review.

**8. State the vision and plans for the future of the department.***Where the Department Would Like to be in Five Years, Assuming Level Funding.*

The department would like to retain its younger faculty members and see them gain tenure. At least four tenured faculty members are likely to retire in the next five years, and the



department would like to see them replaced with tenure-track faculty members. The department would like to increase the retention and graduation rates of its majors (currently very low as evidenced by the five-year majors/degrees conferred ratio average of 15 to 1). A major way to accomplish this would be to increase admission standards for the University.

***Where the Department Would Like to be in Five Years, Assuming an Increase in Funding.***

The department would like to be housed in a new, modern, and spacious science building. It would like to add additional faculty so that a greater variety of courses could be offered, class sizes could be reduced, existing courses could be offered more frequently or additional sections could be added, and dependence on adjunct faculty could be eliminated. Additional administrative assistant help would be provided. A transmission electron microscope would be purchased.

## **9. Program Overview.**

***Brief Overview of the Biology Program***

The department offers major programs in biology (with options in cellular and molecular biology, environmental biology, general biology, and professional biology) and marine biology leading to the Bachelor of Arts or Bachelor of Science degree; a minor in biology; courses and programs applicable to preprofessional curricula in the medical and related health fields; basic coursework applicable to the general education component for all degree programs; and the subject field for secondary teachers of biology through the College of Education. The department has a prominent role in the program of the Marine Environmental Sciences Consortium.

***Mission Statement***

The mission of the program is to provide undergraduate students a superior education in biology, one that is broad-based and exposes the students to all of the major areas of study within the field. Various options and majors are provided so that students may tailor their program of study to individual needs or preferences. Laboratories are offered as essential parts of nearly all courses because they provide students hands-on experience with organisms, biological techniques, and data gathering, analysis, and presentation. General education classes are provided for students in all majors as an essential natural science component of a liberal arts education. Courses are offered that provide nursing, science, physical education, and pre-health professions students with a background in human anatomy and physiology that assists them in progressing within their program of study or entering advanced programs or professional schools.

***Goals and Objectives of the Program Relative to Teaching, Research and Public Service, and Assessment of Program Performance in Relation to Them***

The department has the following goals:



Biology Major, Option in Cellular and Molecular Biology (cont.)

Eight hours from: BI 407 (4), Applied Bacteriology; BI 409 (3), Immunology; BI 495 (1-4), Research/Internship; CH 322/322L (5), Instrumental Analysis  
 CH 311/311L (5), Organic Chemistry and CH 312/312L (5), Organic Chemistry  
 MA 121 (3), Calculus for Business and Life Sciences I and MA 122 (3), Calculus for Business and Life Sciences II, or MA 125 (4), Calculus I  
 MA 345, Applied Statistics I (3)  
 PH 241 (4), General Physics I and PH 242 (4), General Physics II, or PH 251 (5), Technical Physics I and PH 252 (5), Technical Physics II

Biology Major, Option in Environmental Biology

BI 311 (4), Animal Physiology  
 BI 341 (4), Natural History of the Vertebrates  
 BI 463 (3), Plant Taxonomy  
 BI 421 (4), Ecology  
 BI 423 (4), Aquatic Ecology  
 CH 311/311L (5), Organic Chemistry  
 CH 321/321LW (4), Quantitative Analysis or CH 322/322L (5), Instrumental Analysis  
 CH 465 (3), Environmental Regulations  
 ES 131 (4), Physical Geology  
 ES 488 (3), Hydrogeology  
 MA 345 (3), Applied Statistics I  
 PH 241 (4), General Physics I and PH 242 (4), General Physics II  
 One block of courses from either Geography or Industrial Hygiene:  
 GE 225 (3), Maps and Map Interpretation; GE 324 (3) Remote Sensing; GE 424 (3), Geographic Information Systems  
 IH 301 (3), Occupational Safety and Health; *Two* courses selected from the following:  
 IH 322 (3), Industrial Hygiene Problems; IH 333 (3), Industrial Toxicology; IH 422/422L (4), Control of Airborne Hazards; IH 444/444L (4), Sampling Methods in Industrial Hygiene

Biology Major, Option in General Biology

Two animal courses from among BI 310 (4), Comparative Vertebrate Morphology; BI 311 (4), Animal Physiology; BI 340 (4), Invertebrate Zoology; BI 341 (4), Natural History of the Vertebrates; BI 403 (4), Marine Invertebrate Zoology; BI 408 (4), Marine Vertebrate Zoology; BI 433 (4), Embryology; BI 451 (3), Ornithology; BI 452 (3), Entomology; BI 471 (4), Parasitology; BI 472 (4), Histology  
 One plant course from among BI 362 (4), Non-Vascular Plants; BI 363 (4), Vascular Plants; BI 429 (4), Marine Botany; BI 460 (3), Plant Physiology; BI 463 (3), Plant Taxonomy  
 BI 312 (3), Evolution

Biology Major, Option in General Biology (cont.)

One population biology class from among BI 411 (4), Marsh Ecology; BI 412 (4), Marine Ecology; BI 413 (4), Marine Behavioral Ecology; BI 421 (4), Ecology; BI 423 (4), Aquatic Ecology

Biology Major, Option in Professional Biology

Two animal courses from among BI 310 (4), Comparative Vertebrate Morphology; BI 311 (4), Animal Physiology; BI 340 (4), Invertebrate Zoology; BI 341 (4), Natural History of the Vertebrates; BI 403 (4), Marine Invertebrate Zoology; BI 408 (4), Marine Vertebrate Zoology; BI 433 (4), Embryology; BI 451 (3), Ornithology; BI 452 (3), Entomology; BI 471 (4), Parasitology; BI 472 (4), Histology

One plant course from among BI 362 (4), Non-Vascular Plants; BI 363 (4), Vascular Plants; BI 429 (4), Marine Botany; BI 460 (3), Plant Physiology; BI 463 (3), Plant Taxonomy

BI 312 (3), Evolution

One population biology class from among BI 411 (4), Marsh Ecology; BI 412 (4), Marine Ecology; BI 413 (4), Marine Behavioral Ecology; BI 421 (4), Ecology; BI 423 (4), Aquatic Ecology

MA 121 (3), Calculus for Business and Life Sciences I and MA 122 (3), Calculus for Business and Life Sciences II, or MA 125 (4), Calculus I

MA 345 (3), Applied Statistics I

PH 241 (4), General Physics I and PH 242 (4), General Physics II, or PH 251 (5), Technical Physics I and PH 252 (5), Technical Physics II

Marine Biology Major

BI 403 (4), Marine Invertebrate Zoology

BI 408 (4), Marine Vertebrate Zoology

BI 429 (4), Marine Botany

BI 312 (3), Evolution

One population biology class from among BI 411 (4), Marsh Ecology; BI 412 (4), Marine Ecology; BI 413 (4), Marine Behavioral Ecology

MA 121 (3), Calculus for Business and Life Sciences I and MA 122 (3), Calculus for Business and Life Sciences II, or MA 125 (4), Calculus I

MA 345, Applied Statistics I (3)

PH 241 (4), General Physics I and PH 242 (4), General Physics II, or PH 251 (5), Technical Physics I and PH 252 (5), Technical Physics II

Requirements of a Minor for the Above Options and Majors

Biology Major, Option in Cellular and Molecular Biology- a minor in chemistry or additional coursework in biology is required

Biology Major, Option in Environmental Biology- a minor field is not required

Requirements of a Minor for the Above Options and Majors (cont.)

Biology Major, Option in General Biology- a minor or second major in any field is required

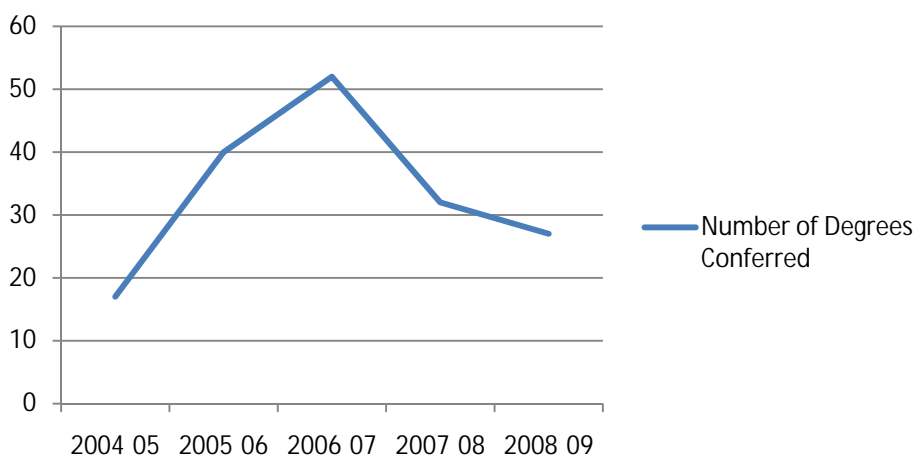
Biology Major, Option in Professional Biology- a minor in chemistry is required

Marine Biology Major- a minor in chemistry is required

*Associated Institutes and Centers*

The department had an annual average of 370 majors during the five-year period. The number of majors increased from 2004-2005 to a maximum in 2006-2007, and significantly decreased during the past two years of the data period. The sharp drop in number of majors, especially from 2007-2008 to 2008-2009, is incongruent with other data. Specifically, enrollments in upper-level (300/400-level) Biology classes indicate a steady increase in the number of students (all Biology majors [or minors]) during this same period. While the number of majors and the number of students enrolled in 300/400-level classes will not match one-for-one, a very close correlation is predicted and expected.

## Number of Degrees Conferred



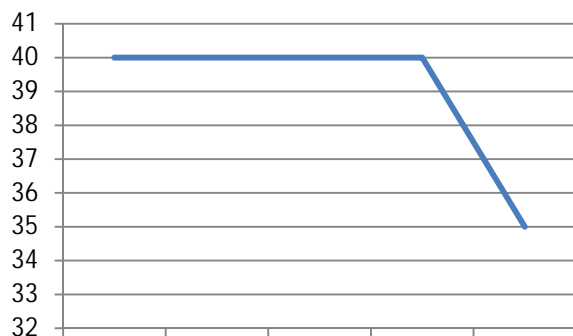
The department annually conferred an average of 34 degrees during the five-year period. The trend for the number of degrees conferred is similar to the trend for the number of majors.

## 10. Program Evaluation.

### *Student Learning Outcomes Assessment, Results, and Actions*

During the period covered in this report, the department had the following student learning outcomes, all of which were assessed with results from the Major Field Test in Biology. The department's goal is for students, as a group, to score in the 50<sup>th</sup> percentile or higher in each of the major biology subject areas and in analytical skills. One hundred sixty-eight students completed the Major Field Test during the report period.

1. Demonstrate knowledge of cell biology, Subscore 1.



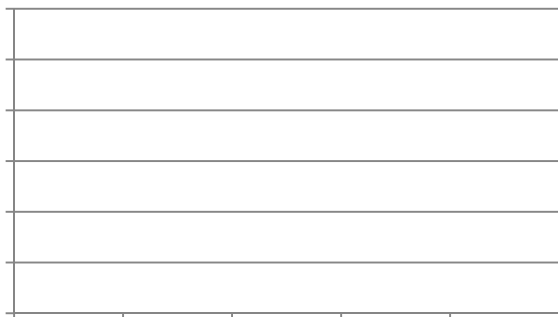
Students did not achieve the goal of 50<sup>th</sup> percentile or higher during any of the five years. The weighted average percentile for all five years was 40.

2. Demonstrate knowledge of molecular biology and genetics, Subscore 2.

The goal of 50<sup>th</sup> percentile or higher was achieved in two of the five years. The weighted average percentile for all five years was 40.



3. Demonstrate knowledge of organismal biology, Subscore 3.



The goal of 50<sup>th</sup> percentile or higher was achieved in three of the five years. The weighted average percentile for all five years was 50.

4. Demonstrate knowledge of population biology, evolution, and ecology, Subscore 4.

The goal of 50<sup>th</sup> percentile or higher was achieved in two of the five years. The weighted average percentile for all five years was 45.

5. Develop critical thinking skills relevant to biology, Assessment indicator 9.

In only one year (2005-2006) was the goal of 50<sup>th</sup> percentile or higher achieved. The weighted average percentile for all five years was 40.

The department recognizes that its students perform most poorly in the subject areas of cell biology and molecular biology and genetics, as well in the area of critical thinking skills. Student performance in the subject areas of organismal biology and population biology, evolution, and ecology is better (at or near the national average), but still less than satisfactory. One response to the evidence of poor performance in cell biology/molecular biology/genetics was the addition of a new option, Cellular and Molecular Biology, to the curriculum. This option was implemented in fall, 2008, and has thus far attracted few students. One of the key courses in this option, Molecular Biology, was scheduled for summer term only (because of a shortage of faculty) and has attracted few students. The department plans to begin offering Molecular Biology during the regular academic year with the goal of attracting more students to the option.

Students are currently only required to take the Major Field Test, with no consequences for performance. Not surprisingly, many students do not take the exam seriously, and this fact is undoubtedly reflected in the poor scores of many students. The department has recently proposed a new one-hour, senior-level course that would involve a review of all of the major subject areas in biology, evaluations of student performance on

improve instruction. All faculty develop and evaluate annual goals. The department chair provides regular performance evaluations to all faculty, and these sometimes include suggestions for improvements. The Major Field Test is administered to all students, and the results are used to identify possible curricular or instructional weaknesses. A new course (Molecular Biology) and a new option (Cellular and Molecular Biology) were added to the curriculum as a result of identified weaknesses in cell biology/molecular biology/genetics. A new course (Senior Assessment Seminar) has been proposed to address serious issues that have arisen from use of the Major Field Test as a primary method of assessment of student learning outcomes. The department chair provides opportunities for faculty to initiate changes and improvements within the department through faculty meetings and an open door policy. The department collectively develops an annual action plan for changes and improvement.

### *Grade Distribution Patterns*

Not unexpectedly, grade distributions for lower-level courses are generally different from upper-level courses. The major difference is that students in lower-level classes earn higher percentages of D's and F's as compared to students in upper-level classes, who earn higher percentages of A's and B's.

## **10. Program Recommendations.**

### *Identify Recommendations for Improvement of the Program within the Control of the Department*

- Retain and graduate a greater proportion of biology majors.
- Improve student performance on the Major Field Test in Biology.

### *Identify Recommendations for Improvement of the Program that Require Action at the Dean, Provost, or Higher Level*

- Construct a modern, spacious science building to accommodate the current and future needs of the department.
- Add additional faculty to the department so that additional sections of current courses can be offered to meet student demand, the frequency of offering of current courses can be increased, and additional courses can be added to the curriculum.
- Purchase a transmission electron microscope.
- Add additional personnel for administrative support in the department.