



SCHOOL OF BIOLOGICAL SCIENCES

Budget Planning Document for FY15

February 1, 2015

Director, Craig Gatto

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1.1 ACCOMPLISHMENTS AND PRODUCTIVITY – FY15

A. TEACHING

Biological Sciences took the initiative from the University to increase enrollment by 4% to heart and made a push to increase our freshman and transfer numbers for 2014-2015 academic year. We sent several letters to students accepted to ISU as well as gave many more tours to parents and prospective students during open houses and transfer days. These efforts paid off extremely well and we enjoyed a growth of approximately 10% (i.e. 2.5X our target) due in a large part to the increased Freshman recruitment efforts (i.e. 192 new freshman in Fall 2014). In addition we share ~30 Biochemistry/Molecular Biology (BMB) majors with Chemistry until that program is officially off of the books. We believe one of our “weapons” in attracting a hire show rate is the new sub-disciplinary areas of study that students can focus on. Whether the students that actually show up then choose to study general biology or one of the focused areas remains to be seen, but at least as a recruiting tool it seems to be something the applicants and their parents like to hear about. Moreover, I would like to mention that this increased population has not come at the expense of quality; our incoming freshman class has an average ACT score of 24.1, which is toward the high end amongst CAS departments.

Unfortunately, we have not had the same success in growing our graduate program. This continues to be a weakness of the School that can only be ameliorated by the addition of high-quality research focused tenure track faculty. The college has been incredibly supportive of Biology over the past five years, which has allowed us to recruit some exciting young colleagues: Dr. Wolfgang Stein, (Neuroscientist; Jan. 2012), Dr. Thomas Hammond (Genome Biology; Aug. 2012), Dr. Rebekka Darnier-Gougis (Biology Teacher Education; Aug. 2012), Dr. Vickie Borowicz (Plant Biology; Aug. 2013), Dr. Benjamin Sadd (Infectious Disease Ecology; Aug. 2013), and Dr. Andres Vidal-Gadea (Molecular Neuroscience, 2014). Also, we are currently amidst the hiring of a new Cellular Immunologist that will be able to contribute to both the MCB and Zoology programs. Unfortunately, we continue to lose faculty at an equal or greater rate than we can hire them such that we remain critically low compared to peer & aspirational Biology programs. Indeed, once again the Dean has been gracious enough to grant Biology another hire this year, we lost two faculty members at the end of last year (Armstrong and Jayaswal), so if our search is successful, we will still take a step backwards in faculty numbers this year. As a direct comparison, ISU Biology has the largest *student to faculty* ratio of ANY of the other state programs including: Univ. of Illinois, WIU, EIU, NIH, SIU-C, and SIU-E. In addition, we have less support staff and non-tenure track instructors than all of them. However, when you compare our scholarship to these other institutions, only the Univ. of Illinois has a superior record to ISU Biology.

In any case, the trickle-down effect of sustained low faculty numbers is certainly taking its toll on the School in all aspects of our educational mission. A viable graduate program relies on a cadre of mentors that can procure extramural funds to support scientific discovery. Fewer faculty mean less grant submissions and fewer mentors, thus it is not surprising that our graduate student population is down by 30% from its peak (around 2004) as is our extramural funding. Concomitantly, we are offering fewer graduate courses as the limited faculty are needed to cover the undergraduate curriculum. More concerning is that the numbers of undergraduates getting research experiences is also down by nearly 50% from 2004 as there are fewer viable laboratories for them to pursue their research interests. So the low numbers of faculty are resulting in Biology falling short of some goals of Educating Illinois. Certainly, our major:faculty ratio is significantly higher than the University's 19:1, which combined with the decreased undergraduate researchers we are falling short of "individualized attention", which is an underscore of Educating Illinois. We have tried to maintain this goal as best as we can by limiting the number of students into the major, but last year we were specifically asked to increase our numbers of majors. Clearly, we need more tenure-track faculty, but we are sensitive to the current fiscal demands on the College and University and understand the reliance on tuition revenue so we increased the number of Biology majors by approximately 10%.

The School proudly continues to be a substantial contributor to the general education program at Illinois State University. Fundamental Concepts in Biology (BSC 101) is an inner core natural sciences course with an enrollment of ~2,000 annually. We know how important General Education is to the University and as such we committed a new faculty line to maintaining Biology 101. We successfully hired Dr. Rebekka Darner-Gougis in Aug. 2012, a Biologist whom also has a PhD in Science Education. Dr. Gougis' focus is on the pedagogy of teaching science to non-science major so she is perfect for coordinating BSC 101. In addition, we offer several other general education courses, such as: Human Biology (BSC 145), enrollment ~400; Microbiology and Society (BSC 160), enrollment ~350; Genetics and Society (BSC 170), enrollment ~400 (*although with Dr. Katz's pending retirement in Dec. '15, this may no longer be offered*); Anatomy & Physiology (BSC 181 and BSC 181), enrollments ~250; Biological Diversity (BSC 196), enrollment ~300; Molecular and Cellular Basis of Life (BSC 197); enrollment ~300 and Human Ecology (BSC 202), enrollment ~75). In our FY15 budget plan, we have included a request for instructor salaries for some these General Education courses. Although in anticipation of decreased university resources, we reallocated intradepartmental resources to hire Dr. Jeff Helms as a permanent NTT to contribute significantly to the general educational mission of the University. Although this use of departmental resources wasn't ubiquitously embraced by all faculty, it has turned out to be a significant benefit to the school and the university.

One of the major future goals of the School is to increase our enrollment in Biology. Given national rates from other college and universities, the proportion of Biology majors at Illinois State University is low compared to the total student population. Indeed, this was the leading factor in deciding to become a School. We are proud that student interest has grown in Biology as evidence by our increased teaching measures, but we have now hit a plateau of approximately 22,000 student generated credit hours. Until 2011, the rise in our overall generated credit hours was due to growth within the major as our contributions to General Education remained constant. Our goal is that the sub-disciplinary sequences that we are developing within the School will attract more students to ISU Biology. However, at our current faculty numbers, we cannot open additional sections of our Freshman sequence (i.e. BSC 196 & 197), which will cap our teaching at ~22,000 Cr Hrs / year for the foreseeable future. Although this year we did increase the number of Biology majors by 10%, we did this by decreasing the number of non-biologists enrolled in BSC 196 and 197.

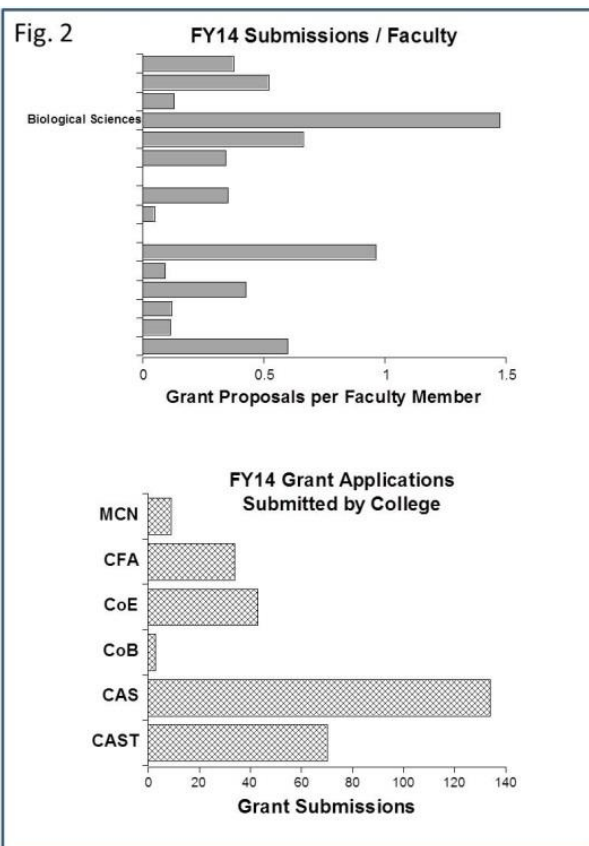
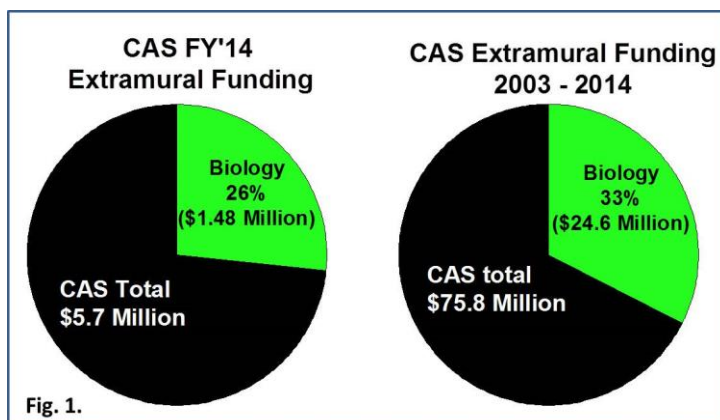
Consequently, our student generated credit hours remained pretty much the same. Moving forward, if we are going to increase the number of Biology majors, we will have to offer multiple sections of BSC 196 and 197 each year because all of the non-biology seats reserved in those courses are for other majors that require them specifically, rather than elective options.

B. SCHOLARSHIP

With ever shrinking state support, the School of Biological Sciences continues to seek extramural support for to achieve its goals. In FY14 the School secured \$1,488,0021 in external grants. This level of research support constitutes a ~4% increase over FY13, but still about 27% below our FY12 levels (\$2.1 M in 2012). This reduced level of extramural support reflects the tougher funding climate as well as most awards having budgets cut in attempts to support more researchers by funding agencies. Biology received extramural support from the National Science Foundation, the National Institutes of Health, the United States Department of Agriculture, and the Environmental Protection Agency. The School of Biological Sciences continues to account for a significant fraction of College and University external funding; the FY14 totals represent 25.9% and 33% over the last decade (Fig. 1).

Biology's extramural funding is holding steady, but below our peak (2004-2006), which is both reflects the current funding climate and a decreased number of applications coming from Biology. Although we continue to average roughly 1.5 extramural grant proposal submissions per faculty member per year, which is equivalent to our submission rate in the mid-2000's, we have six less faculty members which equates to nearly ten less applications per year.

Extramural funding isn't simply a "pot of gold" waiting for faculty to dip their hands into. Rather, there is a substantial amount of work that goes into writing a grant proposal and the faculty within the College of Arts & Sciences should be commended for these efforts. I would equate the work required to prepare a single grant proposal to writing 2-3 peer-reviewed manuscripts. Unfortunately, when a grant is unsuccessful (about 95% of the time), the PI receives almost no credit within our ASPT system. This makes it difficult to



convince faculty that it is worth the effort to write grants, yet Arts & Sciences faculty continue to lead the University in this effort (Fig. 2). In Biology, we continue to lead by example and emphasize the importance of grants and do the best we can via ASPT to reward grant writing efforts. In any case, CAS's (and Biology's) success in attracting extramural funds is not because it is more common within our disciplines, but rather the direct result of hard work and dedication by our faculty members. Indeed, according to Research & Sponsored programs ~29% of Tenure Track faculty submitted grant proposals last year, which would equate to ~0.3 submissions per faculty member per department. The College of Arts & Sciences had nine departments that easily exceeded that metric in FY14 (Fig. 2).

In 2014, Biology faculty published 61 research papers, most of which included graduate and/or undergraduate student coauthors. In addition, the School's faculty and their students gave over 100 external presentations over the year, with undergraduate and graduate students presenting at several National meetings and some International Conferences. In addition, Drs. Wolfgang Stein and Viktor Kirik each won the University Research Initiative award and Dr. William Perry won the College Teaching Award.

Service

Members of the School have continued their outstanding level of service to the University and their respective professions. Faculty members review numerous manuscripts for journals within their particular sub-disciplines. In addition, several BSC faculty members have been selected to review grants for national agencies. Drs. Brian Wilkinson, Steve Juliano, Craig Gatto, Erik Larson, and Paul Garris were invited by the National Institutes of Health to serve as Study Section panel members in 2014. Dr. Scott Sakaluk and Dr. Rachel Bowden reviewed proposals for the National Science Foundation. In addition, several Biology faculty members serve on the editorial boards of journals in their fields. Institutionally, several faculty serve on College and University committees, such as IACUC, CFSC, Radiation Safety, Biosafety, University Research Council, Faculty Research Council, Research Advisory Board, Faculty Senate, Assessment Academy, Intellectual Property Committee, LEAP forward, and ISU Sustainability project. We also have several faculty and staff engaged with the community, e.g. Angelo Capparella has served as a member of the Parklands board for several years and Bethany Evans manages the wild prairie for Funks Grove.

C. NUMERICAL DATA ON BIOLOGY'S ACCOMPLISHMENTS.

See Spreadsheet.

D. FY14 GOALS AND LIST OF ACCOMPLISHMENTS

1. **Recruit New Faculty.** (*Educating Illinois goal 2; CAS strategic focus 1*).
Both the University and College of Arts and Sciences strategic plans prioritize

“Individualized Attention”. The School of Biological Sciences does as well considering the high major to faculty ratio! Our faculty literally spend thousands of hours a year “one-on-one” mentoring students in our research laboratories. The simple fact is that the number of Mentors directly determines the number of Mentees. Our numbers of majors continues to grow and we are eager to have undergraduates in our laboratories actively participating in science. Integral to undergraduate training is our graduate program. In addition to leading our research programs, graduate students also serve as one-on-one mentors to undergraduates. Currently, our numbers of graduate students are low as the graduate student population is directly connected to the number of research faculty. Recruiting talented new faculty to get our School back to full capacity is our number one goal.

Last year we were able to successfully recruit one new faculty member, Dr. Andres Vidal-Gadea, and we are currently searching for one TT faculty member this year. We are very excited to have Dr. Vidal-Gadea join our faculty and he has already recruited two graduate students and three undergraduates to his laboratory. Unfortunately, Biology continues to lose ground in this battle to repopulate our decimated faculty numbers. Once again last year we lost more than we gained. We picked up Dr. Vidal-Gadea, but lost Drs. Jayaswal and Armstrong to retirement. Thus, the running total since I became Director is that we have hired six new Assistant Professors and are currently searching for our seventh. Unfortunately we have incurred the loss of eight faculty members (i.e. Williams, Cheung, Otsuka, Preston, Loew, Whitman, Armstrong, and Jayaswal). Moreover, Dr. Alan Katz has announced that 2015 is his last year and he will retire December 31, 2015. Consequently, since I became the Director, Biology has not gained any TT faculty, yet the University has asked us (and we obliged) to increase our undergraduate enrollment. Thus, ISU Biology is moving further away from the 19:1 instructor/student ratio publicized and decreasing our capacity for providing Individualized Attention, a goal stated in Educating Illinois. I understand that the college has been INCREDIBLY supportive of Biology in providing us at least one hire every year for the past five years. Unfortunately, the long period of minimal or no hiring prior to my Directorship put Biology in a significant hole that we have not been able to climb out of yet. It remains that the most expeditious route to addressing Biology’s shortcomings lies with our ability to recruit additional talented tenure track faculty members.

2. Replace and/or upgrade laboratory instrumentation.

(Educating Illinois goals 2 & 5; CAS Strategic focus 2, 3, & 4)

The following major pieces of equipment were acquired to support teaching and research:

- *Beckman High-speed Avanti Centrifuge* (\$30,500). This is a preparatory centrifuge used for preparing tissue samples for cell culture, molecular biology, enzymology, and microbiology laboratories. The School used to have three functional centrifuges that were purchased with the Science Laboratory Building back in the mid-1990s. However, they all have broken down and repairs were not cost effective for the old machines. Luckily, we received a majority of resources needed from the college (\$23,500) to purchase a single new machine and a new bulk capacity rotor, which is being utilized for all the laboratories.
- *Scanning Electron Microscope* (\$16,000-repair). The School bought two parts for the Scanning Electron Microscope to be replaced as it wasn’t operational. Dr. John Baur

replaced the parts, but it did not resolve the problem as the vendor suggested it would. Moreover, the vendor would not allow us to return the parts, which they said they would if it didn't fix the problem. So we're out the money and still no fixed scope. The School will have to commit significantly more resources to get this repaired either in FY14 or FY15. Although this scope resides in Biology, it is utilized at least equally by Chemistry and some other non-biology folks utilize the facility as well. So if this might be an area where a "Provost Enhancement" may be used to benefit many faculty members from across the university.

- *Fluorescence Activated Cell Sorter* (\$9,700). The School purchased this piece of equipment back when SLB was built in the mid-1990s. The School continues to keep this vital piece of equipment on service contract. This may be the last year the company allows this to be covered as parts are scarce for the machine. Dr. Vogel is hoping to get approve to put in a NSF-MRI grant for a new machine next year. She submitted a request to do so this year, but was not one of the two selected by RSP for submission (university can only submit two proposals in any year).
- *Water Purification system* (\$29,700-repair). The ultrapure water systems in SLB and FSA were all 15-20 years old and no longer reliably producing pure water with 18 mOhm resistance, which is necessary for laboratory quality deionized water (both teaching and research labs). We received \$21,500 from the college and supplemented it with BSC operating and IDC monies to replace five ultrapure systems (4 in SLB and 1 in FSA).
- *Phosphoimager* (\$45,500). The existing phosphoimager is no longer serviced by the company as it is over 20 years old. This is a crucial piece of equipment for Dr. Erik Larson's laboratory and is utilized by the Biotechnology II laboratory. Additionally, our newest colleague Dr. Andres Vidal-Gadea plans to use this piece of equipment as well. Dr. Larson was generous enough to commit nearly half of the cost of the new machine from his NIH grant. The School combined monies from operating, IDC, and laboratory fees to secure the other half and get a new Phosphoimager.
- *Two Walk-in Incubators* (\$24,500). The incubators being utilized by Dr. Juliano's laboratory were over 30 years old and were in need of significant repair. The School and Dr. Juliano (via his NIH grant) were able to combine resources to purchase two new incubators.
- *Annual Vehicle Maintenance*. (\$5,500). The School maintains four vehicles (3 vans and 1 car). We have preventative maintenance work done on a van and the car (e.g. two vehicles needed new tires).

This is the third year of our experiment to "self-insure" our equipment by contributing funds to strategic budget carry over and pay for repairs as the come. We are encountering some significant repair costs, but so far we are financially better off than had we purchased service contracts. For example, the incubators, water purification systems, centrifuge, and phosphoimager have been replaced and are now new. If they were on contract, we could only repair the aging equipment. Now we have incentive and the resources to begin to replace some of the old equipment and update our teaching and research laboratories.

3. Develop new Undergraduate degree program in Biology Teacher Education.
(*Educating Illinois goals 1, 2, 3, & 5; CAS Strategic focus 1, 2, & 4*)

- As the last step in our subdisciplinary degree paths for our students, we successfully completed getting the Biology Teacher Education Degree program through the Illinois Board of Higher Education. This will become part of the next official Undergraduate Catalog and is a significant step for our BTE majors which comprises between 20-25% of our major population.

4. Improve Program Assessment.

(Educating Illinois goals 2A & 2B; CAS Strategic focus 1)

Together with my Assistant Director for Undergraduate Studies, we have begun to implement our revised assessment plan. This is the second year we have issued a questionnaire to our incoming Freshman class, which will be the base line for comparison to an exit questionnaire for seniors. We have also designated a common course (i.e. BSC 204) that is to teach common scientific principles to all our majors (critical thinking, problem solving, stating and testing hypotheses, written and verbal communication). In order to keep this experience similar for all Biology majors, I have asked Dr. Cynthia Moore to serve as the coordinator of this course. Dr. Moore agreed and began this task in Spring 2014. Also, we have asked that each of our sub-disciplinary sequences demarcate a “capstone” course for their sequence that articulates what the key learning objectives are for that sequence and the methods by which they will assess their students.

5. Improve Academic Advising and Career Counseling.

(pg. 46, Recommended in 2010-2015 ISU Master plan. Also, directly embodies Individualized attention which is emphasized throughout Educating Illinois.)

- I support both of my advisors, Ms. Megan Larson and Ms. Margaret Parker and provide them with as much School support as possible so they can best serve our students. I consider their job maturation equally important to the faculty and thus I support their travel to an annual conference on academic advising.

1.2. INTERNAL REALLOCATIONS AND REORGANIZATIONS - FY14

A. REALLOCATIONS AND REORGANIZATIONS

The School reallocated monies to address lost staff (from retirements and resignations) and to help address our decreased teaching capacity due to lost faculty numbers. Combining and reallocating these resources has allowed us to hire Bethany Evans as our Greenhouse gardener for the SLB and FSA greenhouses. In addition, she is the botanical aid to our plant sciences sequence which includes helping with the laboratory needs of many courses in that sequence as well as aiding the botanists with scheduling their research needs as they pertain to greenhouse space. This was a priority I articulated in last year’s Budget Plan and I’m happy to report that it has turned out to be a great success.

In addition, we hired Dr. Jeff Helms. His appointment is 50% instruction and 50% supervisorial. This last year Dr. Helms taught sections of BSC 101 and BSC 160 which helped our commitment to General Education. In addition, last summer he offered our majors Cell Biology Course (BSC 203) as an on-line class in the summer. Indeed, after he took the CTLT workshop on offering on-line courses, he so impressed them that he has been helping CTLT teach that workshop since. For his supervisorial role, Dr. Helms

coordinates the ordering of supplies for all the laboratory courses in the School and routinely monitors equipment utilized in these laboratories. He is also a very skilled “handyman” and completes minor repairs on much of this equipment. When he cannot fix something, he sees to a professional fixing it or suggests its replacement. This has been an outstanding addition to the School. This was a priority I articulated in last year’s Budget Plan and I’m happy to report that it has turned out to be a great success.

In addition, Biology was given a Horticulturist position for the Curator of the Fell Arboretum. Mr. Patrick Murphy was hired in this position. This position is supposed to work closely with Facilities to coordinate planting and caretaking of the plants and shrubs in the Fell Arboretum (essentially all plants on campus with emphasis on the quadrangle). However, there have been some impediments to this process in that Facilities doesn’t seem too interested in soliciting Mr. Murphy’s advice. I guess they don’t have to, but it seems a bit odd that the University would create this position and then have it not be utilized. In the meantime, I have had Mr. Murphy work with the ISU Golf course which has just been officially designated as a member of the Audubon Cooperative Sanctuary Program. Mr. Murphy is collaborating with Dr. Kopsell from Agriculture to get Weibring Golf Course into compliance with Audubon Society requirements. In addition, Mr. Murphy volunteers as the guest of Laura Kennedy on GLT’s GROW program where he answers community questions on gardening and landscaping.

B. USAGE OF ADDITIONAL FUNDS

- Instructional Capacity: Once again we received funds to open more seats in the General Education courses BSC 101, BSC 160, and BSC 181/182.
- Summer Session: Funds were used to operate BSC 101, BSC 197, BSC 203, BSC 219, and BSC 305.
- External Funding: Grant funds were used to support individual faculty research, purchase scientific instrumentation, cover graduate student stipends, provide travel for faculty and students to attend professional conferences. The indirect costs generated from these grants were used to pay for the ISU Animal Care Facility, Repair Equipment, and hire ISU Facilities to make repairs within SLB and FSA.
- College Enhancements. We received \$23,000 to purchase a preparatory high speed centrifuge that is required for several of our laboratory courses. We were able to purchase and install this centrifuge over the summer before Fall classes began. It was utilized extensively in the fall by laboratory sections of: Microbiology 160 & 260; Biotechnology-I 353; Animal Physiology 283.

We also received \$20,000 from the college to replace the water purification systems in SLB and FSA. We replaced all 5 purification systems; the school added \$8,500 to the generous support from the college to make this happen. These systems are utilized by all teaching labs and research labs.

- Foundation: Several scholarships (e.g. *Mockford/Thompson*, *Charlena Wallen*, *John Colwell*, *Robert Gray*, *Bohn/Nielsen*, and *Fred Gletten* scholarships) were funded by donations to the Foundation. External speakers (e.g. *Herman Brockman* and *Omar & Evelyn Rilett* seminar series), candidates, and alumni guests were hosted using funds from the Foundation. Some Graduate student

stipends were also supported via donations to the foundation (Wiegel and Rilett Fellowships). Also, this year we were able to support several graduate students travel expenses to present their research at National conferences.

- **Technology Tuition:** We also received Tech Tuition contribution of ~\$21,000 to replace the nanopure water systems at the end of FY13. We purchased 4 systems. Then we waited until FY14 began so we could supplement the award and purchase a needed 5th unit and pay for installation all at once. We completed this task in the beginning of FY14 before classes started so they were operational for our teaching laboratories.

2.1. MAJOR OBJECTIVES FOR FY'16

The School of Biological Sciences remains committed to *Educating Illinois* and the College Strategic Plan. The School prides itself in providing an undergraduate experience that combines the best qualities of a large Ph.D. granting research institution (i.e. access to state-of-the-art instrumentation and research-active faculty) with those of a liberal arts institution (i.e. daily contact with faculty in class and teaching and research laboratories). It is our aim to expand our top-quality undergraduate program and continue to be a leader in teaching and research at the undergraduate, MS, and Ph.D. levels. Toward this end, the School has several ongoing efforts that will continue. These include:

- Provide high-quality instruction in the classroom and personal mentorship in the laboratory.
- Foster research collaborations within and outside the department
- Encourage service in the University and in the Profession
- Support strong scholarly and professional activities by the faculty and students
- Commit more school resources and faculty effort to our graduate programs
- Promote undergraduate research and provide continuing support for it
- Tailor academic advising to individual student needs in conjunction with our new academic opportunities in our new sequences.

In order to meet these goals we will have the following objectives in order of priority.

1. Hire Tenure-Track Faculty.

When I assumed the Directorship of the School, we were in critical need of faculty. Although we have been granted **seven** new positions in the last five academic years, we have concomitantly suffered **seven** losses, with an eighth, Dr. Alan Katz, retiring **THIS** December 2015. Consequently, we are losing ground since I took over as Director. We absolutely appreciate the incredible support the college has given to Biology and understand the significant costs associated with hiring experimental scientists. Our faculty population issue should have been obvious to the previous administration as we had several very senior faculty members. Unfortunately, the urgency was masked by the \$26,500 in variance money that the School received per vacancy. Thus, there was never a problem covering our courses because we had ample resources to hire NTTs. Once the variance monies were kept centrally, it exposed a huge gap in Biology that was widened by only hiring two faculty

members over a 7-8 year stretch. Consequently, we dug a hole and have struggled to get out because the senior faculty began to retire. It has left us “running in place” with respect to faculty numbers.

We have done our best to maintain the undergraduate program and indeed it has grown over the last decade and it continues with a 10% increase in majors this year. However, this growth was a zero sum gain as we merely decreased the seats available to non-Biologists in our Bio-1/Bio-2 freshman series. We simply do not have the capacity to offer multiple sections and we are at room capacity for these courses. However, I’m afraid we have merely kicked the can down the road, because this increase in majors (per University’s request) will cause us some instructional capacity problems in our upper level courses. We will certainly cover the necessary courses for these students to graduate in a timely manner, but as usual they will come at a cost to our graduate program. This exacerbates the bigger issue with the graduate program which is that lack expertise to cover some classes and many specialty courses have been eliminated from the catalog. Moreover, the decreased number of faculty limits the numbers of graduate students that the School can adequately mentor. This has caused a precipitous drop in our graduate student population and has forced us to reject quality applicants because we do not have sufficient faculty to train them.

Consequently, recruiting additional tenure track faculty members remains our number one priority. As has remained a staple of our justification for hiring additional faculty in Biology, it seems that by any metric (# of majors, # of credit hours, # of graduate and undergraduate degree programs), we are critically understaffed. For example, if one compares Math and Science departments between ISU and EIU, ISU programs have between 40%-100% more tenure track faculty than EIU in ALL departments except Biology where we trail by two TT faculty lines (and 4 staff lines).

2. Continue to raise awareness of the School of Biological Sciences’ strengths and accomplishments to prospective students, alumni, and the general public.

We have made significant movements on this front and are getting more and more facebook followers with several hits each day. We also successfully published our resurrected newsletter last year. I received several emails from alums thanking us for the letter and expressing how impressed they were with the productivity of our Faculty and Students. This will continue to be a key publication from our Publicity Committee. Given the success last year, I have committed additional resources to this committee in FY14. The development of this committee is a direct extension of my time on the Educating Illinois Committee where our students told us that we need to brag more. So we’re bragging!

In FY14, I continue to commit resources to support faculty willing to go to local and state universities and give seminars about their research and discuss our graduate program. We had three faculty do this last year and we have received some graduate student applications from those institutions. Obviously, there is no way to concretely say that our faculty visits precipitated these applications, but we feel this is an additional way for us to brag about ISU Biology and thus we continue to support this effort.

We need to begin more strategic efforts in the area of development, to help with some of the fiscal constraints that the School currently faces. This is an area where I could use guidance. I have thought of forming a community Advisory Board and have a couple of willing participants, but frankly I’m not sure what I would use the board for. Maybe this might be a good topic for one of the Chair Lunches? In any case, in collaboration with the Foundation and with an INCREDIBLE effort by Dr. Bowman and Dr. Dietz, the School has been working with one of our alums for a substantial endowment. We are hopeful to be able and make an announcement confirming this gift in 2015.

3. Re-establish a critical mass of PhD students and increase graduate student population.

The School of Biological Sciences was the first PhD program at Illinois State University; it began in the 1960s. Since that time it has had some ebb and flow, but has remained viable and continued to lead the University in scholarship amongst doctoral candidates. The viability of the Biology PhD program is in jeopardy due to several factors: low numbers of faculty mentors, low numbers of instructional capacity, and decreased extramural funding. I'm afraid we might be entering a vicious downward cycle that may compromise the PhD program altogether. Consequently, I am working with the graduate studies committee to devise ways to increase this population of students. As with most things, funding remains the biggest hurdle. However, applications are up this year and we're hopeful that we will get a solid recruitment for Fall 2015.

4. Continue our contributions to the general education program.

The School of Biological Sciences serves a substantial fraction of the student body through the general education program. We have a diverse offering of general education courses in Biology that are available at the Inner and Middle core levels. In addition to serving thousands of students each year, many of these courses are required for degree programs in other departments (e.g. Nursing, Clinical Lab Sciences, HPER, Geology-Geography). There are many new renovations going on within some of these GenEd laboratories. Thus far the School has been able to fund these endeavors. As always our first step is to be self-sufficient and provide the things that we need both for Biology courses and GenEd. However, sometimes the needs exceed the available resources and then we must ask for help. Certainly, with the announced retirement of Dr. Alan Katz who has taught the General Education course "*Genetics and Society*", BSC 170, our capability will be limited. It is likely that we will no longer be able to offer this course if we unable to replace Dr. Katz.

5. Continue to support Student Research Opportunities.

The School of Biological Sciences has always supported scholarship both with time and financial resources. This will continue in FY'16. Last year we supported several undergraduates travel to conferences to present their research. In addition, the School supported several graduate and undergraduate students during the summer to stay and focus on research productivity instead of having to seek employment outside the university. The bulk of this support comes from indirect costs generated by extramural funds in the School and are used to support research infrastructure, commodities, and student travel.

6. Rainforest Ecology TA line.

The instructors for our Rainforest Ecology (BSC 311) course have been trying to accommodate an increasing demand with a balance between instruction/safety and feasibility (along with trying to reduce the financial burden of the course). I know this annually receives high priority by the College, but it has yet to make the funded. I continue to steal TA support from other courses to fund this important position as safety remains a critical component with this course. This TA line is necessary to help orchestrate and monitor the intense lab that is run in the Costa Rican rainforest. Certainly more instructors will benefit the kids, but there is a substantial safety issue as well. We have had some minor injuries that required an instructor to leave the complex with a student (I believe the worst was a broken arm), but there certainly are dangers that a rainforest poses that increased supervision can help with (e.g. venomous snake avoidance). This course remains a huge success and we remain committed to offering it. We hope that offering such an international learning experience to our students is also something that the university would consider worthy of support.

7. Enhance instrumentation support (Research and Teaching).

Research: At Illinois State University there is an emphasis teaching and scholarship. In the sciences, scholarship is tightly associated with the availability of significant pieces of common equipment. Thus, it is imperative that we keep our instrumentation operational. It is also important to have a dedicated instrumentation support person in-house that can address minor issues and orchestrate service calls from the companies that carry service contracts. We continue to employ an instrumentation technician, Charitha Galva, to orchestrate our equipment repairs. We have asked for funds to expand this to a more full-time technical level position, but funds have not been available to support this request. Unfortunately, this is also one of the first targets for elimination if there are budget cuts mandated by the state. In an attempt to address this situation with limited resources, I hired Dr. Jeff Helms last year as a halftime instructor and laboratory curator. Jeff is technically skilled and is able to fix several pieces of equipment utilized by our students in lab classes as well those working in research laboratories. This hire has already saved us time and money and hopefully will remain to be as successful moving forward. More critical to the College's budget, I was able to craft this position completely from Biology's budget and did not require any College or University resources.

Teaching: Similarly, given that Biology is an experimental science, there are many courses that mandate an accompanying laboratory. The equipment for these laboratories were purchased with the new Science Laboratories Building and many of these items are beginning to break. Consequently, if we are to maintain a high level of instruction, there are several items that need to be replaced. The costs for these items range from a few hundred dollars to tens of thousands of dollars. Unfortunately, such depreciation costs are not allowed to be incorporated into student user fees and thus we have several pieces of instructional equipment (e.g. microscopes, electrophoresis rigs, pH meters, osmometers, pipets, etc...) which need to be replaced. Since this equipment is solely for teaching it is illegal for the School to use IDC funds to purchase them. Given the new flexibility of Tech Tuition, it seems appropriate that many of these items would fall into this funding category and we have listed some ancient items that are in dire straits and critical for laboratory instruction. The School is also saving money to address these issues, but there isn't enough money in our budget or long enough time to save up to address all the aging pieces of equipment. Three critical items are: **1) Portable Computer Lab.** There are several courses in biology that have laboratories that utilize specimens of organisms (plant and animal, or both) which must be kept in a laboratory setting. In addition, these laboratories teach statistical methods and utilize websites critical for systematic organization and identification of these organisms. These are critical skills for students in our Zoology, Plant Sciences, and Conservation Biology degree programs. Unfortunately, given the requirements for organism preservation to be contained in certified laboratories, we do not have a space that can accommodate both teaching modalities. This creates issues when these lab courses commandeer our computer laboratory for a few weeks a semester, which circumvents this space from being utilized during those time periods for the whole semester because of the eventual conflict that would arise when indeed the lab courses require it. Thus, a mobile computer system could be utilized by several of the lab courses and enable the students and instructors to actually benefit from the combinatorial educational approach at the same time, rather than back and forth experience which occurs now (and doesn't exist in the real world at all). **2) Tissue Culture Incubator.** This piece of equipment is utilized by BSC 220, 353, 354, & 361 (we used to have 2, both are dead). We have been getting by with the generosity of PI's allowing students to utilize incubators in their research labs purchased by grant dollars (I'm not sure if this is actually kosher or not, so I haven't asked). **3) 96-Well plate reader.** Like the incubator, this is routinely

used by lab courses such as BSC 160, 220, 260, 353, 354, 361, & 367. We have one plate reader that remains functional (old, but still working), but it cannot accommodate all of the labs that need it. Consequently, PI's again allow their research equipment to be utilized for instruction.

RELATIONSHIP OF THE SCHOOL'S OBJECTIVES TO *EDUCATING ILLINOIS*

The School is committed to supporting and promoting the goals of *Educating Illinois*. These goals align well with the overall mission of the School of Biological Sciences, and each objective described above relates to multiple goals of *Educating Illinois*.

Goal 1. Illinois State University will position students to excel in a globally competitive, culturally diverse, technological, and changing environment. The recruitment of faculty which will enable us to adequately cover the current courses in our catalog, along with the acquisition and maintenance of state-of-the-art instrumentation for teaching and research detailed in Objectives 1 and 3 are crucial for maintaining the competitiveness of Biology graduates in the global economy. Objectives 4, 6, 7, and 9 also help to meet this goal by positioning students with more focused degree programs which will make them more competitive for the 21st century job market. In addition, providing a strong understanding of the life science to non-science majors via general education produces a more informed public that will be called upon to weigh global issues when considering the future leaders of the country.

Goal 2. Illinois State University will demonstrate excellence in scholarship, teaching, and learning at the undergraduate and graduate levels. There is no question that EVERY objective outlined above is directly in line with this Goal. Tenure track Faculty members are the core of an institution of higher learning. In addition quality general education instruction (Objective #2) is a critical component for a well-rounded education. Curriculum development is another key objective the School is dynamically involved in. And the request for a TA line for Rainforest Ecology is to enhance instructional capacity AND a key safety component of the course.

Goal 3. Illinois State University will enhance student, faculty, staff, alumni, and community pride in, and allegiance to, the University. Our efforts to raise awareness of the School's accomplishments (Objectives 4 and 7) will build pride in each of the constituencies listed in this goal. Moreover, a sense of pride in our scientific facilities can be bolstered by ongoing recapitalization of the scientific instrumentation (for teaching and research) that is getting old (Objective 9). We continue to take the lead on this by writing major equipment grants to the NSF and NIH, but these successes also place increased burden on the School via service contracts. We are also addressing what we can via strategic budget carryover of School funds, but it is unlikely we can match the deterioration rate of many pieces of equipment.

Goal 4. Illinois State University will be accountable and fiscally responsible to internal and external stakeholders. Once again, EVERY objective detailed above relates to this goal. Students expect excellence in their major program, especially given the growing financial commitment required to attend Illinois State University. The School's objectives are all aimed at maximizing the return on the students' tuition investment at the minimum expense. Indeed, with significant extramural funding the School of Biological Sciences has acquired equipment and provides cutting edge research opportunities for our students that otherwise would not be possible. Experiences not offered (especially to undergraduates) at many other institutions. Also, field courses like the Rainforest Ecology course are absolute treasures to our students

and the faculty members involved in that course go WAY above the call of duty to provide an absolute outstanding experience (e.g. they give up Thanksgiving Holiday and Fall Break with their families to spend 10 days conducting this learning experience for our students).

Goal 5. Illinois State University will promote a healthy, safe, and environmentally sustainable campus. Proper maintenance of scientific instrumentation and facilities (Objectives 9) is critical to maintaining safe operations in our laboratories. The development of courses and/or curricula in areas such as renewable energy and environmental biology will also promote environmental sustainability along with community awareness during tours of our greenhouse (Objectives 3). And as stated above the TA request for Rainforest Ecology is largely initiated to ensure student safety (Objectives 8).

RELATIONSHIP OF THE GOALS TO THE CAS STRATEGIC PLAN

Much in the same way that the School of Biological Sciences objectives align with the goals of *Educating Illinois*, so do they align with the strategic foci detailed in the College of Arts and Sciences plan. There are some goals within the CAS plan that we are unsure as to how we can assist (marked by “?”), but are certainly willing in anyway the College determines.

Strategic Focus One: Facilitate Academic Excellence.

- *Develop and maintain rigorous academic curricula* (Objectives 1, 2, 4, 5, & 7)
- *Enhance support for faculty research and creative activity* (School’s on-going mission, Obj. 1, 3, 5, & 7)
- *Enhance and encourage support for student research and creative activity* (Objectives 5 & 7)
- *Enhance support for faculty and staff professional development* (Objectives 1, 3 & 7)

Strategic Focus Two: Enhance systems and infrastructure supporting academic excellence.

- *Ensure administrative facilitation of academic excellence* (Objectives 1, 2, 3, 4, 5, 6 & 7)
- *Continue to develop and maintain technology infrastructure and professional staff to support scholarship, creative activity, and student learning* (Objectives 1, 3, 7 & reallocations from last year).
- *Enhance physical infrastructure to support sustainable growth of academic activities and programs.* (Objective 5 & 7)
- *Make physical infrastructure and administrative practices sustainable.* (?)

Strategic Focus Three: Diversify and enhance financial support for academic excellence.

- *Increase funding from external research grants and contracts.* (Objective 1, 2, 3 & 4)
- *Increase funding from contracts for course delivery, custom programs, and other educational activities.* (?)
- *Increase opportunities for resource generation via mission-consistent services and consulting.* (?)
- *Increase contributions from alumni, friends, and benefactors.* (Objective 2)

Strategic Focus Four. Share and promote our academic excellence.

- *Increase mission-consistent outreach and partnerships with our on-campus and community constituencies.* (Objective 2)
- *Promote the local, state, national, and international visibility of the College’s programs, student successes, and faculty and staff achievement.* (Objective 2 & 5)

2.2. PERMANENT FUNDING REQUESTS

1) Permanent Graduate Line (MS Teaching Assistantship): This is a straight forward request. Rainforest Ecology averages between 14-18 students that work all semester learning about the ecology of the rainforest. The culmination of this knowledge is put to the test for 11 days in the Costa Rican rainforest when the students design individual research projects and experimentally test hypotheses. These experiences require several hours of one-on-one attention. Two faculty members travel to Costa Rica as well, but managing more than 5-6 research projects significantly hinders the learning environment of this trip. Thus, having the extra instructional capacity offered by a TA is critical for the success of the course. Moreover, there are safety issues to be considered. If someone does suffer an injury, they would need to be accompanied to the hospital. This would leave a single instructor to attend to the rest of the class. This exact scenario happened when a student broke her arm playing soccer.

2.3. STRATEGIC BUDGETED CARRYOVER (SBC) REQUESTS

Biology is requesting to carry over \$40,000 for equipment replacement and repair from our FY15 budget and add it to our existing SBC to bring the total to \$100,000. This of course will depend on nothing breaking between now and the end of the fiscal year. Also, we will have some monies available in SBC for start-up needs of our newest faculty member that may exceed what the College can support. This is the third installment of our plan to replace the vast majority of our equipment which was purchased with the “new” Science Laboratory Building back in 1996-1997. We have been able to slowly but surely replace some items and we will be doing that next year as well.

2.4. ENHANCEMENTS.

- WE CAN ADDRESS SOME, BUT NOT ALL OF THESE WITH SBC. A LARGE PART DEPENDS ON REQUIRED REPAIRS MOVING FORWARD IN FY15 AND THE RESOURCES NEEDED BY OUR FACULTY RECRUIT.

MOBILE COMPUTER LABORATORY (BSC 196, 201, 211, 231, 355, & 376).

We have one room that has several computer stations (i.e. SLB 121), but it is almost constantly occupied with classes all week. It is becoming increasingly difficult to schedule periodic lab meetings in this room for this reason. That is, there are several courses that need access to computers for laboratory instruction, but only a few times a semester. Thus, this would be better accommodated, by bringing the computers to the class, rather than the class to the computers. Bringing the class to SLB 121 for only a few weeks a semester, then negates that time slot for the other 13 weeks. It is incredibly inefficient. So much so, that it is become easier for instructors to simply drop the computer labs from the curriculum rather than work through the scheduling hassle. Having a mobile cabinet of computers can solve this problem and will likely lead to developing more current computer-based exercises rather than omitting cutting edge scientific experiences. **Total request for FY'16 is one-time \$14,730.**

INCUBATOR – REFRIGERATED SHAKING FOR TEACHING LABORATORIES (BSC 160, 220, 260, 353, 354, 361).

The current unit is 20 years old and now is completely dead and can only function as a paper weight as no parts are available. Consequently, some laboratories had to be canceled and others are being routed through research laboratories to utilize some PI's incubators. **Total request for FY'16 is one-time \$17,100.**

96-WELL MICROTITER PLATE READER (BSC 160, 197, 220, 260, 353, 354, & 367).

The School utilizes six plate readers for teaching and research. Some of the oldest ones are used for teaching many of our lab courses required for the MCB major. Two of these are now dead and have been sent to "surplus" for a proper burial. Consequently, we do not have the capacity to cover our teaching labs. Through the generosity (and with substantial risk) of the PIs that teach these courses, the laboratories exercises have for the most part been maintained because the students have been able to use the machines in research laboratories. Given the biosafety issues with non-trained students going into research space, this is likely not the best strategy for the long term. Consequently, we are asking to replace one of these plate readers for laboratory instruction. **Total request for FY'16 is one-time \$8,680.**

INVERTED MICROSCOPE FOR TEACHING LABORATORIES (BSC 101, 196, 197, 181, 182, 205, 283, 354, 376).

Typical inverted microscopes are required for tissue culture. We utilize tissue culture in many laboratory courses and thus require several operational inverted scopes for students to monitor the growth of their cultures. Lab fees cannot cover the cost of these big ticket items and thus we are requesting funds to replace these periodically so we won't have to come up with \$20-30 K all at once when they all become non-functional. **Total request for FY'16 is to buy a single new inverted tissue culture scope for \$3,300.**

DISSECTING MICROSCOPES FOR TEACHING LABORATORIES (BSC 101, 196, 197, 181, 182, 205, 283, 354, 376).

Dissecting scopes are a "workhorse" for both our GenEd and major laboratory courses. They have incredible versatility and durability. For this reason, many of the scopes we have are actually from when we were over in FSA before SLB was built. However, their lifespan is not infinity and thus we are encountering more and more are breaking beyond repair. Two years ago I altered the lab fee structure to begin to address this issue, but given their longevity, I stretched the cost over several years. That is, I do not think it's fair for current students to cover the entire cost because they happened to be coming in at the end of the lives of these scopes. Thus, these lab fees generate only enough money to replace a couple of scopes per year. At this rate, I think we will hit a crisis. Thus, I am asking for an infusion of resources to get a bigger start on replacing these important tools. **Total request for FY'16 is to buy 10 dissecting scopes with one-time \$9,990.**

SLB GREENHOUSE REPAIR AND SUSTAINABILITY. (BSC 101, 196, 197, AND MANY COURSES IN OUR PLANT BIOLOGY SEQUENCE).

The Greenhouse is obviously as old as SLB, since they were built at the same time. Maintenance of this facility used to be considered “part of the building” and thus its repairs were covered by institutional facilities. However, it is no longer defined that way and repair and maintenance costs are the sole responsibility of the School. This past year we have had several glass plates slip out of place leaving gaps in the enclosure. We have repaired some of these and patched up other spots until the weather is more hospitable. Of course, I think we have broken some rules by constructing these repairs ourselves but without the resources to get them fixed our options are limited to canceling the labs that require greenhouse space or fix them ourselves. But this facility is quite old and can use replacement/repair at many sites. So we are requesting funds to get the greenhouse properly working once again (i.e. replacing our cardboard fixes with glass for starters). **Total request for FY’16 is a one-time investment of \$15,000. Technically, I consider this a Facilities request as they’ll be the ones getting the money.**

2.5. PERSONNEL REQUESTS: TENURE TRACK FACULTY-NEW. Biology is in dire need of several TT faculty lines. However, we understand the budget constraints facing the College/University and recognize our colleagues in other departments have faculty needs as well. Thus we are only requesting a single position next year, which will keep us at a net -1 in faculty numbers since I took over as Director (-2 when Al Katz retires in December). As I have made clear in my annual budget presentations, we are not just saying we’re down because of historic faculty numbers in Biology. Rather, I provide significant data comparing ISU Biology to comparable or aspirational institutions, which have demonstrate that our faculty numbers are between 65% and <20% of those institutions. Indeed, ISU Biology currently mimics much smaller schools that we do not consider peer institutions (e.g. EIU, WIU, SIUE). Unfortunately, with the retirements of Armstrong and Jayaswal last year and Katz this year, we have now fallen behind EIU and SIU-E.

1) Virologist

2.6. PERSONNEL REQUESTS: TT FACULTY-NON-REAPPOINTMENT

- None