



ICBE Three-Year Self Review

September 19, 2007

Institute for Cross-college Biology Education

Undergraduate Biological Sciences Advisor, Introductory Biology Courses, Biology Core Curriculum,
Majors: Biology, Molecular Biology, & Biological Aspects of Conservation, Center for Biology Education

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BACKGROUND

The Institute for Cross-college Biology Education (ICBE) was created in 2003 and the first permanent Director was appointed June 1, 2004. A three-year internal-review was called for in reports that led to the creation of the Institute and this document is that three-year review.

ICBE was created to provide an institutional home and advocacy for a number of programs in biology education that did not fit within any single department. Many of these programs have been reviewed independently. This report will cover the relationships among programs and the success in making the whole greater than the sum of the parts. This is not a comprehensive report of the individual programs.

The Institute was created in response to the Roberts Committee Report, which recommended an umbrella organization, and the Susman Committee Report on implementation. Both of these reports are available at:

http://www.biology.wisc.edu/Administrative_Information

The Institute name and scope were spelled out by Provost Peter Spear:

“Called the Institute for Cross-college Biology Education (ICBE), the new organization will serve as an umbrella for undergraduate biology programs and majors that span more than one school or college. These include the four-semester honors biology sequence, called the Biology Core Curriculum, or Biocore; the Zoology/Botany 151 and 152 introductory courses; the majors of Biology, Molecular Biology and Biological Aspects of Conservation; and the current Center for Biology Education.”

PROGRAM REVIEW

The Susman Committee Report recommended “that the new [Institute for Cross-college] Biology Education be required to perform a self-review after three years of operation and that it be reviewed by an external review team after five years. After three years, the members of [I]CBE should be able to enumerate the problems that they have addressed and the opportunities that they have tried to develop. They should be able to recount any unexpected problems that they have faced and noteworthy successes that they have achieved. They should have some sense of their progress in resolving problems and stimulating positive change.”

This report lays out some of the history of the creation of ICBE, how the initial agenda for action was developed, and then provides an overview of issues in administration, undergraduate services, and the Center for Biology Education (CBE).

HISTORY

The specific charge to ICBE can be seen in the reports leading to its creation.

Excerpts from the Roberts Committee Report

The *ad hoc* Biology Education Planning Committee (BEPC) was given the charge by Provost Spear to “Identify the strengths and weaknesses of cross-campus undergraduate biology education (including courses and programs such as Botany/Zoology 151/2, Biocore, the Center for Biology Education, and the cross-college biology major) at UW-Madison and recommend ways to improve it.

...many of these activities have been created and sustained through the individual efforts of a small number of faculty and staff. As a consequence, the activities are based on individual personalities and there is generally no institutional continuity.”

Possible solutions

“...the committee felt that the best solution was the creation of a modest administrative unit, with budgetary authority, to house and coordinate many of these cross-campus biology activities...The Institute should be physically housed in a space that would allow the reasonable proximity of most if not all of the affiliated units. This would allow sharing of resources and provide a visible and comprehensive center for students and faculty.”

SETTING THE INITIAL ICBE AGENDA

To establish the priorities and to launch ICBE, a transitional advisory committee with broad representation from across campus was appointed for the first year of operation. On October 14, 2004, this group met for five hours in the Pyle Center to develop an action plan with the assistance of the Office of Quality Improvement. The Transitional Advisory Committee outlined the following priorities for establishing ICBE:

- (1) Broadly communicate ICBE’s mission
- (2) Develop effective relationships with schools and colleges
- (3) Define and establish a new culture of collaboration
- (4) Design a budget system
- (5) Clarify and define ICBE structure
- (6) Establish ICBE space
- (7) Explore alternative resources and funding.

Below are comments on how each of these priorities was addressed during the first three years of ICBE.

- (1) A mission statement was written over the course of the first year.

“The Mission of the Institute for Cross-college Biology Education (ICBE) is to provide infrastructure, leadership, and a forum for consultation needed to achieve the best possible education in biology for students at the UW-Madison, for future students (K-12), and for informal learners of all ages.”

(2) The vision of the committee reports that led to the creation of ICBE was that ICBE would be similar hierarchically to the Gaylord Nelson Institute for Environmental Studies, with a director that reported directly to the provost and was part of the Biodeans group. The Biodeans group was reluctant to add a new member. Two specific meetings with the Biodeans occurred to launch and then hear a report on the results of a review of the introductory biology course (Biology/Botany/Zoology 151 and 152). Individual meetings with the Deans of the College of Agriculture and Life Sciences (CAL S) and the College of Letters and Science (L&S) have taken place as have semi-regular meetings with the associate deans of these two colleges. ICBE was invited and has regularly participated in the Council of Associate Deans, which meets approximately monthly during the academic year.

(3) An institute-wide meeting during the first year drew together people involved in CBE, the introductory courses, and the interdisciplinary majors. In years two and three the oversight structure of the institute changed and an advisory committee broadly representative of biology across campus was set up (Appendix A). Each semester, a town-hall style meeting is held to address one or two topics of importance to the programs within ICBE. In Spring 2006 the topics were ICBE history, an internal report from Biology/Botany/Zoology 151/152, and an update on possible new space for undergraduate biology programs and courses. In the Fall of 2006 the topics were building space and access to introductory courses. The following language was approved “The Advisory Committee supports a mixed use facility, which might increase the likelihood of garnering WARF/donor dollars. Any plan would need broad political support. Tom is encouraged to work with Bio Deans, CAL S, L&S and other colleges who have common interests.” In March 2007 the topics were the instructional building (again) and the three year review of ICBE.

ICBE and CBE staff regularly attend meetings of the Biological Sciences Curriculum Committee.

However, most of the collaboration comes about through the service on the many executive committees of the programs in ICBE. Over 120 faculty and staff participated in ICBE-related programs during the academic year 2006-2007 (Appendix B).

(4) The components that now make up ICBE previously had separate budget arrangements, in some cases reflecting constraints at the time the component was created. A new account group (UDDS, A-37) was created and funding for many components of ICBE was rationalized by shifting funding responsibility and authority. Guiding principles include moving budgets for functions that are not easily handled by any single department to ICBE and leaving in place budgets for things that are best handled by the individual schools and colleges. As an example, the budget of the Biology Major, which is available in two different colleges, was consolidated from CAL S and L&S to ICBE while funding for the introductory biology course (Zoology 151/152) was left as a sub-account in the Department of Zoology.

As the introductory biology course was expanded through the 1990's, the third lecture section of the course was paid for by a recurring \$100,000 transfer from CAL S to L&S imposed on CAL S each year. This imposed yearly budget transfer was of significant concern to Dean Elton Aberle. ICBE negotiated a settlement whereby the \$100,000 was permanently transferred from CAL S to L&S, costs associated with oversight of the Biology Major were assumed by ICBE, and a fifth lecture section of the introductory biology course was funded. This rationalized the budgets and resulted in a much needed expansion of the introductory course, essentially from the resources of ICBE.

(5) The Transitional Advisory Committee recommended formation of a broadly representative advisory committee that meets once or twice per year to be kept informed of ICBE actions plus a small steering committee to meet monthly with the ICBE Director to guide day-to-day decision-making (Appendix A1).

For the future, ICBE oversight should be more formally aligned with university academic governance. Governance language based on Faculty Policies and Procedures with structure drawn from the governance document of the Gaylord Nelson Institute for Environmental Studies is suggested in Appendix A2.

(6) Space was renovated in the building at 445 Henry Mall (the old Genetics building) to house several components of ICBE including the Student Academic Services Office, the ICBE Director, and the Center for Biology Education. This has had the intended effect of fostering greater collaboration between the Center for Biology Education, with its programs for teaching enhancement, and the instructional staff of the introductory biology course sequences. This space is also the physical home of the Biological Aspects of Conservation, Biology, and Molecular Biology Majors as well as Beta Beta Beta (the undergraduate biology club).

The longer term vision for a building that would consolidate the various functions of ICBE into one location has been delayed from what was hoped when ICBE was created. Plans for a fourth Biostar building have fallen through and so a new plan has been developed. ICBE, L&S and CALS began joint discussions on an interdisciplinary biology building that would emphasize undergraduate teaching. However, it was not possible to make a plan that was jointly supported by all three entities and the plans right now call for an L&S interdisciplinary biology building that will also house ICBE. L&S has indicated this building is their top priority for new buildings.

The Issue Statement for this building is available at

http://www.biology.wisc.edu/Administrative_Information/

(7) A significant advantage of the creation of ICBE is the opportunity for closer collaboration between the innovative initiatives of CBE and the introductory biology courses. CBE has continued their significant success in attracting external funding, with in excess of \$2,000,000 awarded to CBE-led programs during the time that CBE has been within the ICBE umbrella (see table under CBE below). Natural connections to pursue funding opportunities are growing and two examples stand out. A proposal to NSF (Dave Nelson PI) for purchasing a 3D printer to make physical models was funded and the physical models of enzymes and other biologically important molecules were quickly incorporated into the Biocore curriculum. One of the strengths of Biology 152 is the placement of students into research labs across campus and a recent NSF award (Janet Branchaw PI) for nearly \$1,000,000 will recruit and support students from underrepresented groups to do interdisciplinary research in the biological sciences. The new program connects with the mentoring program development of the Wisconsin Program for Scientific Teaching. There is now a significant opportunity to combine this program and the development of mentoring training with the independent project component of Biology 152.

There has been less success in getting external funding directly for the introductory courses. Proposals from people outside the course to include the course as a testing ground for curriculum reform have been difficult because the responsibility for the course is unclear. The question has been raised whether the ICBE Director is authorized to write letters of support for grants submitted to the National Science Foundation program on Curriculum, Classroom, and Laboratory Improvement proposals. Opportunities to combine the significant entrepreneurial expertise of CBE with the natural laboratory of Biology 151/2 remain, and would be helped by a clearer organizational structure.

Summary of response to agenda The text above shows a few highlights of how ICBE worked to make progress on those issues identified by the Transitional Advisory Committee. In the next sections the current components and issues within ICBE are described in three sections – Student Academic Services, Center for Biology Education, and administration.

STUDENT ACADEMIC SERVICES

Advising

ICBE can be seen as having two major branches. The Center for Biology Education remains a strong unit with high visibility on campus. The other branch is the Student Academic Services branch. This branch provides support for the majors and courses, and a considerable amount of time is spent on advising at multiple levels.

Advising support in the majors – ICBE staff provide support for faculty advisors in the interdisciplinary majors. They orient new advisors in the majors, field questions from advisors, assign students to advisors, and track advisees in the majors. Facilitation of student-faculty interaction is a primary goal of this activity. A website with degree requirements and advisor tools is maintained. Exceptions to requirements in the major are handled through a web-based form that advisors fill out. The required paperwork is then generated in the ICBE majors office. Advisors and students can get information on how to request exceptions to college requirements from ICBE staff.

Biological Sciences Advisor – The position of Biological Sciences Advisor, currently held by Pat Henrikson, was incorporated into ICBE. The Biological Sciences Advisor advises students interested in biological science who have not decided upon a specific major. Incorporation into the Student Academic Services branch of ICBE has provided this position with the appropriate physical location and administrative support. This person sees over 100 families of prospective students per year making this position a very important contact point between the public and the University. The Biological Sciences Advisor serves as the Biology Consultant at Student Orientation, Advising, and Registration (SOAR) all summer and other SOAR sessions.

Biology Major CALS Peer Advising Program – This program connects incoming biology majors in CALS with a peer advisor and faculty member. Biology Major Freshmen are easily identifiable in CALS because they are required to declare their major at SOAR. A similar program in L&S has not been established because L&S students do not declare a major at SOAR and thus, potential L&S Biology Major freshmen are more difficult to identify.

Information technology – ICBE staff have participated in development of technology to support academic advising. ICBE staff serve on the Academic Tab advisory team for MyUWMadison and have tested and commented on new ways of delivering information to advisors, especially faculty advisors. The institution of “DARS What If” that allows students to run a DARS audit as if they were in a different major was heavily lobbied for by ICBE.

L&S students expressing an interest in biology – Students in L&S who express an interest in biology are assigned to ICBE Student Academic Services staff (>50 students for each ICBE Student Academic Staff person) by the Letters and Science Advising Service (LSAS). The students are advised to keep options open for as long as possible so that students can move to any biological science major with minimal difficulty.

SOAR – ICBE staff participate in all SOAR sessions for L&S, CALS, and for the rest of campus as the Biology Consultant. This represents a significant contribution of resources from ICBE to SOAR and also keeps ICBE staff informed about incoming students and helps ICBE predict demand for the introductory courses.

Courses

Biocore – Biocore was reviewed a few years before the creation of ICBE and it was judged a highly successful program worthy of extraordinary support to provide an elite educational experience for students who are well prepared and willing to put in the effort expected. In 2007, 28 students entering the UW-Madison School of Medicine and Public Health are alumni of Biocore, probably reflecting both the quality of students attracted to Biocore and the training the students receive in Biocore. Biocore training is probably even more suited to graduate school. Unfortunately, the demand for places in Biocore has fallen off and ICBE and Biocore staff have been discussing possible reasons. These include a misperception that a student's GPA suffers in Biocore (see section on "Reports") and the increase in Biology 151 availability in the Spring, when advanced students have finished with Chemistry 109 and can either start 151 or wait a semester to start Biocore. Biocore and ICBE are committed to increasing the applications to Biocore so that an elite group of 160 students start the program each year. Biocore has excellent faculty involvement and has an executive committee and lecture sections chairs. They have suffered from retirements and need a few more professors committed to Biocore and discussions have taken place to get professors involved. However, this is a slow process and there are opportunities for ICBE to help attract faculty to Biocore. Lecturer recruitment is a high priority for Biocore.

Biology 151/152 – The Hearn Committee Report of 1991 recommended creating a cross-college one year introductory biology sequence of two courses with lab. Rather than creating a new course, it was decided to expand the scope of the Botany/Zoology joint course 151/152. The change of this course to a campus-wide endeavor resulted in significant resources being invested in the course, including funds from a Howard Hughes Medical Institute Grant that was supporting CBE, a mandatory yearly transfer of funds from CALS to L&S, and money called the Governor's Initiative, new money from the state to support undergraduate education in Biology. Instructors from all over campus were recruited such that no single department accounts for much more than one quarter of the teaching. The contributions for 2007-08 are roughly equal from Botany, Zoology, all CALS departments, all allied health schools, and ICBE. Today there are five lecture sections per year compared to the single lecture section at the time of the Hearn Committee report with three quarters of the funding for the increase coming from non L&S sources. The growth of the course and its changing nature from a course taught jointly by two departments to a campus-wide course occurred as resources could be made available. In 2004, ICBE initiated a review of the course, similar to the Biocore review conducted several years earlier. The Biodeans endorsed the review and it was undertaken jointly with L&S. The internal document and the report of an external review committee are available online:

http://www.biology.wisc.edu/Administrative_Information

The external review committee reported that "While we believe the course sequence is run as well as any other major biology introductory courses at peer research universities, virtually every group we met with reported that the course simply cannot continue to function as it currently is – it is bursting at the seams and nearly at the breaking point." There remains an opportunity for ICBE to guide the course to a more stable and innovative condition.

The existence of ICBE was intended to help promote a sense of campus ownership of the course. Toward that end, ICBE pushed for some internal structure in which faculty in the course played a more explicit

role in decision making. The course responded positively by establishing an executive committee composed of one lecturer from each of the six major topic areas taught in the course plus two coordinators and two graduate students. Within each lecture section, one of the lecturers was designated as the person with overall responsibility for that lecture section. These changes have spread the ownership and responsibility to faculty across campus. This builds faculty loyalty and increases commitment of faculty to the course.

Biology 151 continues to see more demand than space available despite having gone from one to five lecture sections over the past 15 years. To help students, ICBE now runs a web-based waitlist service for 151. This was based on the model instituted by the Department of Spanish. For this coming Fall over 250 student authorizations were made. Many of the students taking Biology 151 also take Chemistry 343, another course that closes out. There is an opportunity to coordinate waitlists, since getting into a lecture in one of these courses can require a student to swap sections in the other course.

In addition to the funding opportunities noted above, the creation of ICBE has promoted interaction between Biology 151/2 and CBE in other ways. Fall of 2007 a DELTA Instructional Materials Development (IMD) course (DELTA is a separate program for integrating research, teaching, and learning) developed expressly for instructors in Biology 151/152 is being taught by Bob Jeanne (Chair of Biology 151/152) and Lillian Tong of CBE. This course has six teams that have selected a particular concept, idea or issue that is important to teaching in 151 or 152 and each team is exploring the issue and proposing mechanisms to improve student learning. The DELTA program, CBE, and Biology 151/152 all existed before ICBE but the existence of ICBE makes the interaction of these three programs a little easier. An especially positive sign is the young (just before and just after getting tenure) faculty who have joined the course and are participating in the community building IMD course of DELTA. This indicates that there are further opportunities to connect the desire for teaching biology on the part of professors in several different colleges and the need for instruction in introductory biology.

Staff of Biology 151/152 have also enthusiastically embraced adding community-based research/service learning opportunities into the course. They work with Jane Cramer of CBE and together, Jane and 151/152 staff work with the Morgridge Center. This cross-campus synergy has enhanced opportunities for students in Biology 152 to incorporate civic engagement as part of their independent project.

Biology 153 – The College of Engineering requested a lecture-only option of introductory biology. While Zoology 101 is one current option, engineering felt that the topics in Biology 151 better suited the needs of engineering students but that the lab requirement of Bio 151 was difficult to fit into engineering students' schedules. A lecture-only version of 151 was initiated for the Fall of 2007 and called Biology 153. Enrollment in this course is limited to students in an engineering program and these students attend lectures and discussions with Biology 151. ICBE helped catalyze the creation of Biology 153.

Course access – With the burgeoning demand for introductory biology courses, it has been difficult to keep up with demand. This situation is exacerbated by the decline in enrollment in Biocore from their historical average (157 average from 1989-1998) to 120 students in 2007. In the past, students who did not get into 151 were told to go to the first lecture and, over the first two weeks of the semester, schedules were shuffled until the course was filled. This led to much student resentment and angst as they spent the summer not knowing whether they were enrolled in a course that would account for one-third of their schedule. ICBE instituted a web-based waitlist and students were accommodated much sooner. Nevertheless, in 2007 over 100 students were left on the waitlist and did not get into Biology 151 for Fall 2007. These are almost all students who will be starting their second year and not being able to enroll in the introductory biology course is a significant disruption to their program. The primary limitation is TA support. Space in labs becomes a limiting factor soon thereafter but it would be possible to increase the

size of the course by 10% simply with additional TA resources. The responsibility for negotiating for TA positions has been contentious and is only now migrating to ICBE. Opportunities exist for a more predictable supply of TA positions for the course and for more advance planning for how to use resources to make the course the best it can be.

Compensation for teaching – A major component of the ICBE budget was funding to provide compensation for teaching in the introductory biology courses. The formula used in setting the budget was \$6,000 per lecturer for lecturing about one third of a course. This plan was not put into place, in part because the calculations were in error for 151/152. Eighteen units of teaching were allowed for but 30 units were needed by the time the expansion to the fifth section was considered. In addition, it was found that even \$6,000 was not a deciding factor in whether a faculty member would teach in the course. A policy was instituted that a professor who came into the course new or a professor who taught in excess of their required teaching load when all of their teaching was considered, or a professor who taught a second unit of 151/152 in any given academic year would be given \$5000 to his or her home department. The policy was designed to encourage bigger commitments to lecturing in 151/152 to reduce the number of professors in the courses. Even so, a number of short term staffing needs arose and ICBE funded all of the short term staff requirements.

With over 30 professors involved in teaching, it is to be expected that each year there will be some gaps in coverage. Professors go on sabbatical, fall ill, or retire. If professors took a sabbatical every seven years four gaps in lecturing would be expected each semester. These can be difficult to fill, especially when they arise unexpectedly. Teaching is an integral part of being a professor so it is not reasonable to expect a large pool of professors available to step in each semester.

The gaps in lecturers have been handled by hiring short-term staff in the past but a new program has been put in place. Many of the post-doctoral associates in research labs on campus intend to find employment in universities. To be competitive, they need to be mentored in teaching. Therefore, ICBE enters into an agreement with the PI employing a post-doc. The PI and the other lecturers in the course agree to act as mentors for the post-doc while the post-doc gives up to 15 lectures and prepares an exam on the material. This gives the post-doc much-needed experience in lecturing in a university setting but with significant support. The post-doc's mentor is given an amount of money that compensates for the possible reduction in time in the lab by the post-doc. Because the relationship is with the PI, if the post-doc is found to be unable to meet minimum competency, the PI would be asked to step in and lecture. The post-docs are selected on a competitive basis and the commitment of the post-doc to teaching is factored into the decision. This program will start in Fall of 2007 and two of fifteen lecturers are post-docs in this program. This is about the level foreseen. This provides a mechanism for gaining teaching experience that is very difficult for post-docs to obtain otherwise and avoids simply hiring someone "off the street" with no formal support mechanism.

Majors

The three majors overseen by ICBE have widely different histories but are now all administered through one office. Because the majors serve different student populations, a single major would not serve the students nearly as well. On the other hand, the common administrative support means that it costs nothing extra to have all three majors instead of just one. The three majors appeal to different faculty and it has been somewhat easier to keep the number of faculty advisors needed for the specialty majors (Biological Aspect of Conservation (BAC) and Molecular Biology) as opposed to the generic Biology major. On the other hand, the Biology major is nearly 10 times larger than the specialty majors so many more faculty serve as Biology Major advisors than in the other majors. The creation of ICBE made it possible to maintain the diversity of interdisciplinary biological science majors without administrative overhead that

would otherwise be associated with three totally independent majors. ICBE has institutionalized the administrative support for the three majors. This involves assisting in preparation of reports and keeping student records.

ICBE has provided an equitable method of compensating the chairs of majors for the additional burden of overseeing the major. This replaced some haphazard compensation mechanisms. In one case, compensation that was to be an alternative to a package offered the previous year was instead added to the previous package and one of the majors was receiving more compensation than given to department chairs. Correcting this mistake caused hard feelings. The ICBE Steering Committee approved the following policy:

Because serving as chair of an interdisciplinary major is more work than to normal committee work expected of professors, ICBE will provide one-half month of summer salary or equivalent support for the chairs of BAC and Molecular Biology. Each Co-Chair of the Biology Major will also receive this amount of compensation.

ICBE writes an appointment letter to each chair each year spelling out this support. This has introduced some fairness into the compensation of chairs of interdisciplinary majors.

BAC– The mandated review of the BAC major is currently underway. ICBE staff provided data for the self assessment and assisted the external review committee. The report of the review committee has now been submitted and will be considered by the College of Letters and Science and the ICBE Steering Committee in the Fall. The report emphasizes the unique role of the major and its importance to the diversity of offerings on campus. The number of BAC majors is well over 100 and has been consistently higher since ICBE started representing it at major’s fairs and similar student information forums.

The BAC major has an endowed scholarship to support undergraduate research and ICBE staff assists the BAC Chair in selecting the awardee and then in getting the award to the student.

The Biology Major – The Biology Major is now the second largest major on campus on the basis of graduations, behind Political Science. This major is available from either CALS or L&S. It attracts excellent students. The graduating GPA is third behind Biochemistry and Molecular Biology among the large biological science majors.

One of the reasons for developing the Biology Major was to improve advising for students in their first two years. For CALS students, a peer advising system was set up and every entering Biology Major in CALS is matched with a volunteer peer advisor (a junior or senior Biology Major). This ensures contact with each first-year student at several critical junctures during the first year. Each peer advisor reports to a faculty member, who often meets with all of the students assigned to the peer advisor, so that first year students have a peer they can approach and an assigned faculty member.

The Biology Major was designed to accommodate specialization without needing to create separate majors. Neurobiology was the first option in the Major and it has worked well. A Bioinformatics Option was considered but it was not possible to accommodate the program that students should have to be well-trained in bioinformatics within the framework of an option within the Biology Major. Similarly, efforts to devise a certificate in Bioinformatics did not bear fruit. It appears that Bioinformatics needs to be a separate major and it is likely that a proposal will be put forward this coming academic year. ICBE will likely provide administrative support as this major gets created and could serve as the home for the major if the faculty proposing the major requests that.

Another area that has been proposed as an option is Evolutionary Biology. This has fit easily within the framework of the Biology Major requirements and a proposal has been delivered to CALS and L&S for their consideration. The Evolution Option is backed by a dedicated group of faculty who will provide the intellectual oversight and additional advising. The proposal was put forward by the Biology Major Executive Committee and approved by the ICBE Steering Committee acting as an Academic Planning Council for ICBE. It is anticipated that this will become available to students in the coming academic year.

Discussions were held on how a Public Health emphasis might be accommodated. There remains an opportunity to create some sort of public health program for undergraduate students.

International opportunities – ICBE has committed to participation in an International Internship Center being proposed by Dean Gilles Bousquet of International Studies. ICBE continues to work toward increasing the number of students who spend time in international programs and has made changes in requirements when these were seen as impediments to participation in semester abroad programs.

ICBE helped International Studies develop a program of cooperation with University of Bonn for UW-Madison students to spend 10 weeks in Bonn doing research in laboratories there. This program is joint with Harvard University. In 2007 seven UW-Madison students participated in this program. ICBE will oversee grading of the research credits given to the participants based on a written report provided by the students.

The Molecular Biology Major– At the time ICBE was created, Molecular Biology was undergoing its mandated 10 year review. ICBE provided statistics for the review and the review concluded that the major was healthy and serving a distinct student population. A new Chair and new advisors have been recruited. The major has considered expanding to become available in CALS. This was not successful more than a decade ago but the objections at that time have now been corrected. Expansion of Molecular Biology to CALS should be pursued in the coming academic year.

For several years the Molecular Biology major had funding for a student-run seminar. ICBE worked with students to select a speaker and facilitate travel and the visit of the speaker.

CENTER FOR BIOLOGY EDUCATION

The Center for Biology Education was placed administratively under ICBE. Originally, no faculty director was envisioned for this new arrangement. However, it was felt that the CBE mission was broad enough and that name recognition of CBE in the community was such that its independence should be maintained. A comprehensive report of CBE activities is provided each year by CBE; therefore only the result of integrating CBE into ICBE is discussed here.

One of the original missions of CBE was to provide support for innovation in undergraduate biology teaching. CBE played an important role in creating many of the components that eventually were to become ICBE, including creation of the Biology Major, establishment of the Biology Advisor position, and stimulation of the expansion of Biology 151/152. The creation of ICBE facilitated joint appointments in CBE and ICBE. Two staff members of CBE, as part of their appointment, now participate as lecturers in the introductory biology course sequences. This has significantly speeded up incorporation of innovative teaching methods into the introductory biology course sequence. Biology 151/152 undertook experiments in case-based learning as a result of the joint appointment of a CBE staff member as a lecturer. The incorporation of podcasts into biology instruction was catalyzed by funding a Biology 151/152 coordinator for a summer and podcasts were then used in Biology 152 by a CBE staff member

jointly appointed as a lecturer in Biology 152. The new IMD course for faculty and staff in the course and the incorporation of community-based research/service learning opportunities for students as part of the Biology 152 independent project have been described earlier.. The interaction between CBE and the introductory courses has been facilitated by the creation of ICBE and further opportunities remain.

CBE's participation in ICBE has facilitated the development of experimental new courses for students in the biological sciences. Two such courses are currently being implemented and evaluated as Biology 375 Special Topics courses – “Undergraduate Biology Research Seminar” and “Engage Children in Science - Lead After-school Science Clubs”. Partnership among CBE, ICBE and the Digital Media Center at Biotech led to a successful proposal as part of the Provost's Technology Enhanced Learning Initiative to incorporate the tools and approaches of bioinformatics into undergraduate courses. The close collaboration and information exchange stemming from co-location of CBE and the ICBE advising staff at the ICBE 445 Henry Mall location have been extremely productive in speeding and enriching the delivery of information to students about the many options available to them in the biological sciences.

CBE has continued its success in bringing in outside funding to their programs. A list of the significant external grants for CBE-led programs during the period of ICBE's existence is shown in the table below. CBE programs often work in partnership with PIs from across campus to provide broader impacts for research grants in precollege, undergraduate and future faculty education, and CBE has extensive cooperative interactions with large, externally-funded education initiatives such as CIRTl and SCALE. Funding of SCALE, CIRTl, the Long-Term Ecological Research program and WISCAMP attributable to CBE staff exceeded \$500,000 for the past three years. Funding from other sources to support students in summer research programs run by CBE exceeded \$400,000 for the past three years.

A fuller description of the many activities of CBE can be had at their website
<http://www.wisc.edu/cbe/>

Agency	PI	Title	Duration	Budget
UMDNJ	Niemi	Health Observances and Public Education Partnership	9/03 to 8/08	\$117,500
Beckman	Nelson	Beckman Scholars Program	6/04 to 9/07	\$105,600
NSF	Nelson/Wolf	Physical Models in Teaching Structure and Function of Biological Macromolecules to Undergraduates and Graduate Students	9/04 to 8/07	\$200,909
NSF	Wolf	National Science Digital Library	1/05 to 12/07	\$356,400
UWF	Ledin/ Mladenoff	Climate Change in the Lake Superior Region - An Exhibit and Community Education Project - Ira and Ineva Reilly Baldwin Wisconsin Idea Endowment	1/06 to 12/07	\$75,564
NSF	Branchaw/ Baum	REU Site: Integrated Biological Sciences Summer Research Program for Undergraduates (competitive renewal)	2/06 to 2/11	\$440,321
NSF	Branchaw/ Pfund	Undergraduate Research and Mentoring In the Biological Sciences (URM)	10/07 to 9/12	\$908,253
*NSF (CCLI)	Pfund/ Branchaw/ Mathieu	Improving Undergraduate Research Experiences in STEM Through Mentor Training	9/07 to 8/10	\$375,000
Wisc. DNR	Mladenoff/ Ledin	Paradise Lost	7/07 to 6/08	\$23,000
Virginia Polytech	Niemi	Partnership for Research and Education In Plants (Prep)	9/06 to 8/07	\$10,800

* Through WCER, Branchaw Co-PI

WisTEP

For many years Raymond Kessell of the Department of Genetics ran the Wisconsin Teacher Enhancement Program, one of a number of outreach activities for Wisconsin science teachers. Upon Raymond's retirement, Howard Martin, Dean of Extension, asked ICBE/CBE to continue a teacher enhancement program with the name of WisTEP. Several courses with significant online components have been developed as a result and WisTEP is being used as an umbrella for many science programs for Wisconsin teachers. It is hoped that this new incarnation of WisTEP will maintain the strength of Raymond's program and build on it to better serve Wisconsin teachers and future teachers.

CBE is overseeing the institutionalization of WisTEP and working to increase visibility of teacher enhancement programs run by science groups across campus as well as creating new courses with innovative delivery methods including all on-line and mixtures of on-line and experiential programs.

ADMINISTRATIVE ISSUES

Accounting

ICBE was intended to be a thin umbrella and so there was a mandate to avoid substantial administrative overhead. Accounts for CBE and personnel appointments etc. has been handled historically as a sub account within CALS as a service to campus. A new UDDS was established for ICBE (A-37) and it is administered by CALS as a service to campus. All of the CBE accounts have been transferred to this

UDDS (A-37-0200 for CBE, A-37-0300 for advising and support of the majors, and A-37-0400 for courses). This arrangement has worked very well. All appointments and funding for the courses, on the other hand, have remained as sub accounts within the Department of Zoology. Budget transfers are made to L&S in support of the courses. In some cases L&S required funds to first be transferred to a central L&S account, and from there it was transferred into a course-specific account. This process has often been cumbersome. ICBE has been seen more as a source of funding than a source of campus input into the oversight of campus-wide courses.

Organizational chart

The Susman Committee recommended two major branches to ICBE (Appendix C1). This has been put into practice with shared administration. In particular, Jane Harris Cramer, Dennis Kuester (financial administration), and Dave Augustine (technology support) serve both branches. Brian Asen provides support for courses and programs in both branches. The funding for each of these positions is split between ICBE and CBE.

The hope for ICBE to consolidate oversight of the introductory courses has not been realized. Funding for supplies for the two courses now occurs through a transfer of funds from ICBE to L&S and in fiscal year 2007-2008 will occur directly into the course sub-account. This was put in place as part of the negotiations that resulted in the creation of a fifth section of 151/152. Staffing requests from Biocore are handled in the office of the L&S Associate Dean for Natural Science while TA and staffing requests for Biology 151/152 are sent through the Department of Zoology to L&S with a copy of the request after the fact to ICBE (Appendix C2). The 151/152 external review suggested that oversight needs to be streamlined, either all through ICBE or none through ICBE. This issue needs to be addressed in determining the future of ICBE.

Reports

Information about introductory biology education can be difficult to pull together. ICBE has issued reports on occasion during the first three years to help build a shared knowledge base. The two most formal reports concerned the growth of interest in biological sciences from 1995 to 2004 and analysis of grading in the introductory courses.

Growth report – The number of students graduating with biological science degrees was assessed over the period of 1995 to 2004. During this time some bachelors programs became graduate programs (e.g. the Pharm. D. program). The conclusion in the report was that for majors considered to be in the biological sciences “*graduations have increased from 521 to 787(per year) between 1995 and 2004, an increase exceeding 50%.*” Not surprisingly, this put a significant burden on the introductory biology courses and the report concluded that “*annual enrollment in laboratory-based introductory biology courses has increased from 1314 to 2095, an increase of more than 50% over the past decade.*” The beginning of the expansion of 151/152 was well underway by 1995, the baseline year so that the trend for increasing interest in biology has been present for over 15 years.

Grading report – The enrollment pressure in Biocore has declined (enrollment in the first course of the sequence dipped below 150 for the first time in 1999). One suggested explanation for this phenomenon was that students were avoiding Biocore in order to get a better grade. The grades assigned in Biocore and in 151/2 were analyzed and plotted against the ACT scores of students in the courses. Overall, grades given in Biocore were higher than those given in 151/2 and the difference matched the higher ACT scores of the Biocore students. The report concluded

that “Biocore students are generally better prepared and generally get better grades than do students in 152. Thus, there is no evidence for a GPA penalty for taking Biocore.”

Timetable department

A Biology Timetable department number was established. While ICBE has no faculty, incoming students often look for the “biology” courses to be together in one place. Now, all of the introductory biology course sequences are in one place in the timetable to make it easier for students to see the diversity of introductory course offerings available to them. In addition, directed studies course numbers (299 and 699), senior theses (681, 682, 691, 692), experimental courses (375 and 675), and an internship/field experience course (399) can now be taught as Biology courses. The Ways of Knowing Biology course for first year students, which had been difficult to find in the catalog, has now been relabeled as Biology 150.

OPPORTUNITIES AND CHALLENGES FOR THE FUTURE

Significant opportunities for ICBE to catalyze improvements in undergraduate biology education lie ahead. This next year (2007/2008) should see the initiation of an Evolutionary Biology Option within the Biology Major. Significant discussions of a Bioinformatics Major should occur through this academic year and it is possible a proposal could be started into the approval process as early as Spring 2008. Funds awarded to ICBE through the Provost’s Technology Enhanced Learning initiative are supporting creation of bioinformatics teaching modules and curricula that will complement its development, and ICBE is viewed as a logical place to house the new major.

The review of Biology 151/152 highlighted the opportunity for the course to serve as a place for developing and testing innovative, effective teaching and learning methods. Streamlining oversight of Biology 151/152 and Biocore could enhance the campus-wide ownership of these courses that will build on the involvement of biologists from across campus in these courses. Faculty and staff of Biology 151/152 and Biocore have significant opportunities to apply for education grants from NSF, enhanced by the closer cooperation between CBE and Biology 151/152 that is taking place because of ICBE.

Recruitment of professors to teach in the introductory biology courses remains a concern of many. A multi-pronged approach to staffing the courses is beginning to yield results. Blanket monetary compensation for teaching was not effective but using funding in innovative ways to free up time in professor’s schedules to teach met with significant success. With regard to direct faculty recruitment, the emphasis has been on creating teaching incentives. Professional development and opportunities for mentoring post-docs in teaching methods have been attractive. The challenge in such an approach is to allow faculty sufficient freedom to develop their own teaching approaches and materials while at the same time maintaining consistency and coherence across course sections. It will be vital, therefore, to nurture strong faculty leadership, to empower the 151/152 Executive Committee to oversee the course and to designate a chair from among the lecturers in each section, who has the ultimate responsibility for decision-making in that section. This model has already proved to be highly successful in Biocore.

In addition, many people connected with ICBE programs feel that more administrative support is needed to encourage and even require professors to participate more in teaching. Incentives are working, but slowly. Pressure from campus leadership is also working, effectively in some ways. For example, assistant professors nearing tenure decision in the Medical School are seeing teaching in introductory courses as an effective way of meeting teaching requirements for tenure and the Divisional committee is supporting this. Once these professors start teaching, they often continue in the introductory courses.

Another measure that has been called for is pressure directly on departments to supply some designated number of people to teach in courses. Finding the right balance between incentives and “top-down” directives is a challenge for the future.

The original vision was for ICBE to carry out cross-campus education functions similar to those that are often carried out in a college of biology without creating a college and without having faculty tenure homes in ICBE. The model was the Gaylord Nelson Institute for Environmental Studies. However, the Director has not been part of the Biodeans Council, and was instead invited to join the Council of Associate Deans. ICBE has been seen as a logical home for cross-campus majors, courses that serve all students in the biological sciences and outreach programs such as WisTEP that span biology. Its existence has created many opportunities, some of which are in very early stages of development. This has been a challenge to accommodate when ICBE is not included in discussions and negotiations at the college level. To fully represent the needs and interest of programs that have no traditional home, yet are important to individuals in multiple schools and colleges it will be important for the ICBE Director to have the authority and credibility to interact at the level of a Dean.

The change in leadership of ICBE is a time to revisit the campus vision for the Institute. The institute has great potential to bring leadership and important resources to biology education initiatives all across campus as a full partner at the college level. The transition is an opportunity to make further steps toward fulfilling the vision of ICBE operating as a thin administrative organization at the college level\ “to provide infrastructure, leadership, and a forum for consultation needed to achieve the best possible education in biology for students at the UW-Madison, for future students (K-12), and for informal learners of all ages.”

APPENDIX A1 – CURRENT COMMITTEE STRUCTURE for the Institute for Cross-college Biology Education (ICBE)

The ICBE shall have two committees, a large, representative advisory committee and a small steering committee.

Steering Committee

The Steering committee shall be composed of four faculty and two academic staff members. The purpose of the Steering committee shall be to:

1. meet monthly, or more often as required, with the director,
2. stay informed about developments within ICBE,
3. identify issues that need to be considered by the advisory committee,
4. provide advice on short and medium range directions of ICBE.

A slate of candidates will be developed by the Director and discussed with the Advisory Committee (see below). Once there is general agreement on the slate, it will be recommended for appointment to the Provost. The Steering committee members shall be appointed for three year, staggered terms with the possibility of renewal. The steering committee would meet at least monthly and standing schedule conflicts would be resolved by replacing the steering committee member.

Advisory Committee

The Advisory Committee shall be made up of representatives of groups with an interest in undergraduate biology education. The purpose of the Advisory Committee is to:

1. provide for information exchange,
2. provide advice on the long term direction of ICBE,
3. help identify people to participate in biology teaching, and
4. consult on the slate of candidates for the steering committee.

The Advisory Committee membership will be people from

Advising/Majors

- Biology (Ken Sytsma)
- Molecular Biology (Bill Bement)
- Biological Aspects of Conservation (Don Waller)

CBE advocates (4)*(Chosen by CBE)

Colleges (Chosen by respective Dean)

- L&S (David Baum)
- CALS (Rick Amasino)
- One person agreed upon by Med. /Vet./Nursing/Pharmacy

Courses

- Bio 151/2 (Bob Jeanne)
- Biocore (Jeff Hardin)

Departments (Chair or their representative)

- Bacteriology (Jo Handelsman)
- Biochemistry (Elizabeth Craig)
- Botany (Donna Fernandez)
- Genetics (Mike Culbertson)
- Zoology (Karen Steudel)
- Med/Vet/Nursing/Pharmacy department (Rotating)
- Other department with significant ICBE involvement (Rotating)

Academic Staff (4)*

Students (4)*

Teaching Assistants (2)

* “broadly representative of the campus biology community.”

Most people will serve on the basis of their position. Terms on the Advisory Committee will be determined by their position (e.g. the Chair of each major would be on the ICBE Advisory Board for as long as they were chair of the major). Students and TAs would have a limited tenure because of graduations. Academic Staff would be appointed for three year terms with the possibility of renewal and expectation of staggered terms.

APPENDIX A2 – SUGGESTED GOVERNANCE COMMITTEE STRUCTURE (Patterned after Gaylord Nelson Institute for Environmental Studies document.)

Committees of the Institute for Cross-college Biology Education

All members of a committee are voting members unless specifically stated otherwise.

a. Steering Committee and Academic Planning Council

The central governance committee for ICBE is the Steering Committee. The Steering Committee serves the functions of an Academic Planning Committee as described in FP&P 3.08. According to FP&P 3.08, an Academic Planning Council advises the Director on "programs and budgetary planning" and "present(s) program views and opinions" to the Director. The APC is intended to be a central governance vehicle for faculty and staff input into a broad range of planning and decision-making affecting ICBE programs and budgets, and the Director has an obligation to engage in meaningful consultation on a broad range of policy decisions with the APC.

The APC is charged with (1) advising the Director on matters such as program review and future expansion or contraction of academic programs within ICBE; (2) advising the Director in developing strategic plans and long-range planning for the institute; and (3) considering any other factors relevant to the capacity of the institute to fulfill its missions

The APC consists of four faculty members, two academic staff members, the Director of the Center for Biology Education, and the Director of ICBE (ex-officio). APC members are nominated by the Advisory Committee (see below) and approved by the current Academic Planning Council. A slate is forwarded to the Provost for appointment. Members of the APC serve staggered, three-year terms and can be reappointed up to three times. Selection of APC members should consider the range of activities within ICBE including courses, majors, advising, and CBE. The APC will meet at least three times each semester.

The APC will also serve as the Curriculum Committee for the Biology Timetable entry.

b. Advisory Committee

The Advisory Committee on information exchange and representation of the diverse components of the biology community on campus. The Advisory Committee should have two or more meetings per year at which the Director will report on current issues in biology education and where members will be invited to raise issues for discussion by the group. The focus would be on inclusiveness. The composition would be (one person representing each bullet except as noted):

Advising/Majors (Chair or their representative)

- Biology
- Molecular Biology
- Biological Aspects of Conservation

CBE Colleagues (4)*

Colleges (Chosen by respective Dean)

- L&S
- CALS
- One person agreed upon by Med. /Vet./Nursing/Pharmacy

Courses

- Bio 151/2
- Biocore

Departments (Chair or their representative)

- Bacteriology
- Biochemistry
- Botany
- Genetics
- Zoology
- Med/Vet/Nursing/Pharmacy department (Rotating)
- Other department with significant ICBE involvement (Rotating)

Academic Staff (4)* (both instructional and administrative staff should be represented)

Students (4)* (both undergraduates and graduate [TAs] should be represented)

Any member of the Steering Committee not covered by one of the sections above

* “broadly representative of the campus biology community.”

- c. The Director and Steering Committee may designate *ad hoc* committees as they see fit to work on issues that may arise. *Ad hoc* committee members could be drawn from the Advisory Committee or from outside the institute.
- d. The Director and Steering Committee may recommend to the Advisory Committee the creation of separate standing committees when they determine that such a standing committee would further the mission of the Institute.
- e. There will be no faculty appointments within ICBE.

APPENDIX B – PARTICIPANTS IN ICBE-RELATED ACTIVITIES

Name	Department	College	Role	Role	Role
Jean-Michel M. Ane	Agronomy	College of Agricultural and Life Sciences	advisor, Biology Major		
Nelson E. Balke	Agronomy	College of Agricultural and Life Sciences	advisor, Biology Major		
Natalia De Leon Gatti	Agronomy	College of Agricultural and Life Sciences	advisor, Biology Major		
Shawn M. Kaeppler	Agronomy	College of Agricultural and Life Sciences	advisor, Biology Major		
William F. Tracy	Agronomy	College of Agricultural and Life Sciences	advisor, Biology Major		
Mark E. Berres	Animal Science	College of Agricultural and Life Sciences	advisor, Biology Major		
Mark E. Cook	Animal Science	College of Agricultural and Life Sciences	advisor, Biology Major	Biology Major Executive Committee	
Thomas D. Crenshaw	Animal Science	College of Agricultural and Life Sciences	advisor, Biology Major		
Marion L. Greaser	Animal Science	College of Agricultural and Life Sciences	advisor, Biology Major		
Ronald P. Kean	Animal Science	College of Agricultural and Life Sciences	advisor, Biology Major		
John J. Parrish	Animal Science	College of Agricultural and Life Sciences	advisor, Biology Major		
Marcin S. Filutowicz	Bacteriology	College of Agricultural and Life Sciences	advisor, Molecular Biology Major		
Robin S. Kurtz	Bacteriology	College of Agricultural and Life Sciences	advisor, Biology Major		
Timothy D. Paustian	Bacteriology	College of Agricultural and Life Sciences	advisor, Biology Major		

Name	Department	College	Role	Role	Role
Gary P. Roberts	Bacteriology	College of Agricultural and Life Sciences	advisor, Biology Major	ICBE Steering Committee	
Thomas F.J. Martin	Biochemistry	College of Agricultural and Life Sciences	advisor, Biology Major		
David L. Nelson	Biochemistry	College of Agricultural and Life Sciences	advisor, Biology Major	Director of the Center for Biology Education	ICBE Steering Committee
Ann C. Palmenberg	Biochemistry	College of Agricultural and Life Sciences	advisor, Biology Major		
Michel A. Wattiaux	Dairy Science	College of Agricultural and Life Sciences	advisor, Biology Major		
Thomas L. German	Entomology	College of Agricultural and Life Sciences	advisor, Molecular Biology Major		
Robert L. Jeanne	Entomology	College of Agricultural and Life Sciences	advisor, Biological Aspects of Conservation and Biology Majors	Course Chair of Biology 151/152	Instructor in Biology 151
Richard L. Lindroth	Entomology	College of Agricultural and Life Sciences	advisor, Biological Aspects of Conservation Major		
Barbara H. Ingham	Food Science	College of Agricultural and Life Sciences	advisor, Biology Major		
Steven C. Ingham	Food Science	College of Agricultural and Life Sciences	advisor, Biology Major	Chair of the Biology Major	
Eric L. Kruger	Forest Ecology & Management	College of Agricultural and Life Sciences	instructor in Biology 152		
Nicole T. Perna	Genetics	College of Agricultural and Life Sciences	advisor, Biology Major	Biology Major Executive Committee	instructor in Biology 151
Ahna R. Skop	Genetics	College of Agricultural and Life Sciences	advisor, Molecular Biology Major		
Richard D. Vierstra	Genetics	College of Agricultural and Life Sciences	advisor, Biology Major	instructor in Biology 152	
Johanne Brunet	Horticulture	College of Agricultural and Life Sciences	instructor in Biocore 301		

Name	Department	College	Role	Role	Role
Brent H. McCown	Horticulture	College of Agricultural and Life Sciences	advisor, Biology Major		
James Nienhuis	Horticulture	College of Agricultural and Life Sciences	advisor, Biology Major		
Jiwan P. Palta	Horticulture	College of Agricultural and Life Sciences	advisor, Biology Major		
Philipp W. Simon	Horticulture	College of Agricultural and Life Sciences	instructor in Biocore 301		
John C. Stier	Horticulture	College of Agricultural and Life Sciences	advisor, Biology Major		
Evelyn A. Howell	Landscape Architecture	College of Agricultural and Life Sciences	advisor, Biology Major	instructor in Biocore 301	
Caitilyn Allen	Plant Pathology	College of Agricultural and Life Sciences	advisor, Biology Major		
John H. Andrews	Plant Pathology	College of Agricultural and Life Sciences	advisor, Biology Major		
Amy O. Charkowski	Plant Pathology	College of Agricultural and Life Sciences	Biology Major Executive Committee	advisor, Biology Major	
Ann E. MacGuidwin	Plant Pathology	College of Agricultural and Life Sciences	advisor, Biology Major		
Patricia S. McManus	Plant Pathology	College of Agricultural and Life Sciences	advisor, Biology Major		
Christine E. Pfund	Plant Pathology	College of Agricultural and Life Sciences	instructor in Biology 675		
Douglas I. Rouse	Plant Pathology	College of Agricultural and Life Sciences	Biology Major Executive Committee	advisor, Biology Major	instructor in Biology 151 & 152
Teresa C. Balser	Soil Science	College of Agricultural and Life Sciences	instructor in Biocore 333		
Nicholas J. Balster	Soil Science	College of Agricultural and Life Sciences	advisor, Biology Major	instructor in Biology 375	

Name	Department	College	Role	Role	Role
William J. Hickey	Soil Science	College of Agricultural and Life Sciences	advisor, Biology Major		
Katherine D. McMahon	Civil & Environmental Engineering	College of Engineering	advisor, Molecular Biology Major		
Karen B. Strier	Anthropology	College of Letters and Science	advisor, Biological Aspects of Conservation Major		
Janet M. Batzli	Biology Core Curriculum	College of Letters and Science	instructor in Biology 375, Biocore 302 and 304		
Michelle A. Harris	Biology Core Curriculum	College of Letters and Science	instructor in Biology 375, and Biocore 304 and 324		ICBE Steering Committee
Seth A. McGee	Biology Core Curriculum	College of Letters and Science	instructor in Biocore 302		
Timothy F. Allen	Botany	College of Letters and Science	instructor in Biology 152		
Cecile M. Ane	Botany	College of Letters and Science	advisor, Biology Major		
David A. Baum	Botany	College of Letters and Science	advisor, Biology Major	instructor in Biology 151	
Christopher D. Day	Botany	College of Letters and Science	advisor, Biology Major	instructor in Biocore 303 and 323	
Donna E. Fernandez	Botany	College of Letters and Science	advisor, Biology Major	instructor in Biology 151 and 152	
Thomas J. Givnish	Botany	College of Letters and Science	advisor, Biological Aspects of Conservation Major		
Sara Hotchkiss	Botany	College of Letters and Science	advisor, Biology Major		
Bret R. Larget	Botany	College of Letters and Science	advisor, Biology Major		
Marisa S. Otegui	Botany	College of Letters and Science	instructor in Biology 151		
Edgar P. Spalding	Botany	College of Letters and Science	advisor, Biology Major	instructor in Biology 152	advisor, Biology Major
Kenneth J. Sytsma	Botany	College of Letters and Science	Biology Major Executive Committee	Chair of the Biology Major	
Donald M. Waller	Botany	College of Letters and Science	advisor, Biological Aspects of Conservation Major	Chair of the Biological Aspects of Conservation Major	
Lyn S. Turkstra	Communicative Disorders	College of Letters and Science	advisor, Biology Major		
Karl S. Zimmerer	Geography	College of Letters and Science	advisor, Biological Aspects of Conservation Major		

Name	Department	College	Role	Role	Role
Catherine Auger	Psychology	College of Letters and Science	advisor, Biology Major		
Craig W. Berridge	Psychology	College of Letters and Science	advisor, Biology Major		
Kurt J. Amann	Zoology	College of Letters and Science	advisor, Molecular Biology Major		
William M. Bement	Zoology	College of Letters and Science	Chair of the Molecular Biology Major	advisor in Molecular Biology	instructor in Mol. Biol.686
Seth S. Blair	Zoology	College of Letters and Science	advisor, Biology Major	instructor in Biology 151	
Stanley I. Dodson	Zoology	College of Letters and Science	advisor, Biological Aspects of Conservation and Biology Majors	Chair of the Biological Aspects of Conservation Major	instructor in Biology 152
Stephen C. Gammie	Zoology	College of Letters and Science	advisor, Biology Major	Biology Major Executive Committee	
Yevgenya Grinblat	Zoology	College of Letters and Science	instructor in Biology 151		
Mary C. Halloran	Zoology	College of Letters and Science	advisor, Biology Major		
Jeffrey D. Hardin	Zoology	College of Letters and Science	advisor, Biology Major	Chair of the Biocore Program	instructor in Biocore 303
Anthony R. Ives	Zoology	College of Letters and Science	advisor, Biological Aspects of Conservation Major		
Carol E. Lee	Zoology	College of Letters and Science	instructor in Biology 151		
Brian F. Manske	Zoology	College of Letters and Science	instructor in Biology 375		
James B. Pawley	Zoology	College of Letters and Science	advisor, Biology Major		
Warren P. Porter	Zoology	College of Letters and Science	advisor, Biology Major		
Karen L. Steudel	Zoology	College of Letters and Science	advisor, Biology Major		
Antony O. Stretton	Zoology	College of Letters and Science	advisor, Biology Major	instructor in Biology 152	
Monica G. Turner	Zoology	College of Letters and Science	instructor in Biology 152		
Paul H. Zedler		Gaylord Nelson Institute for Environmental Study	advisor, Biological Aspects of Conservation Major		

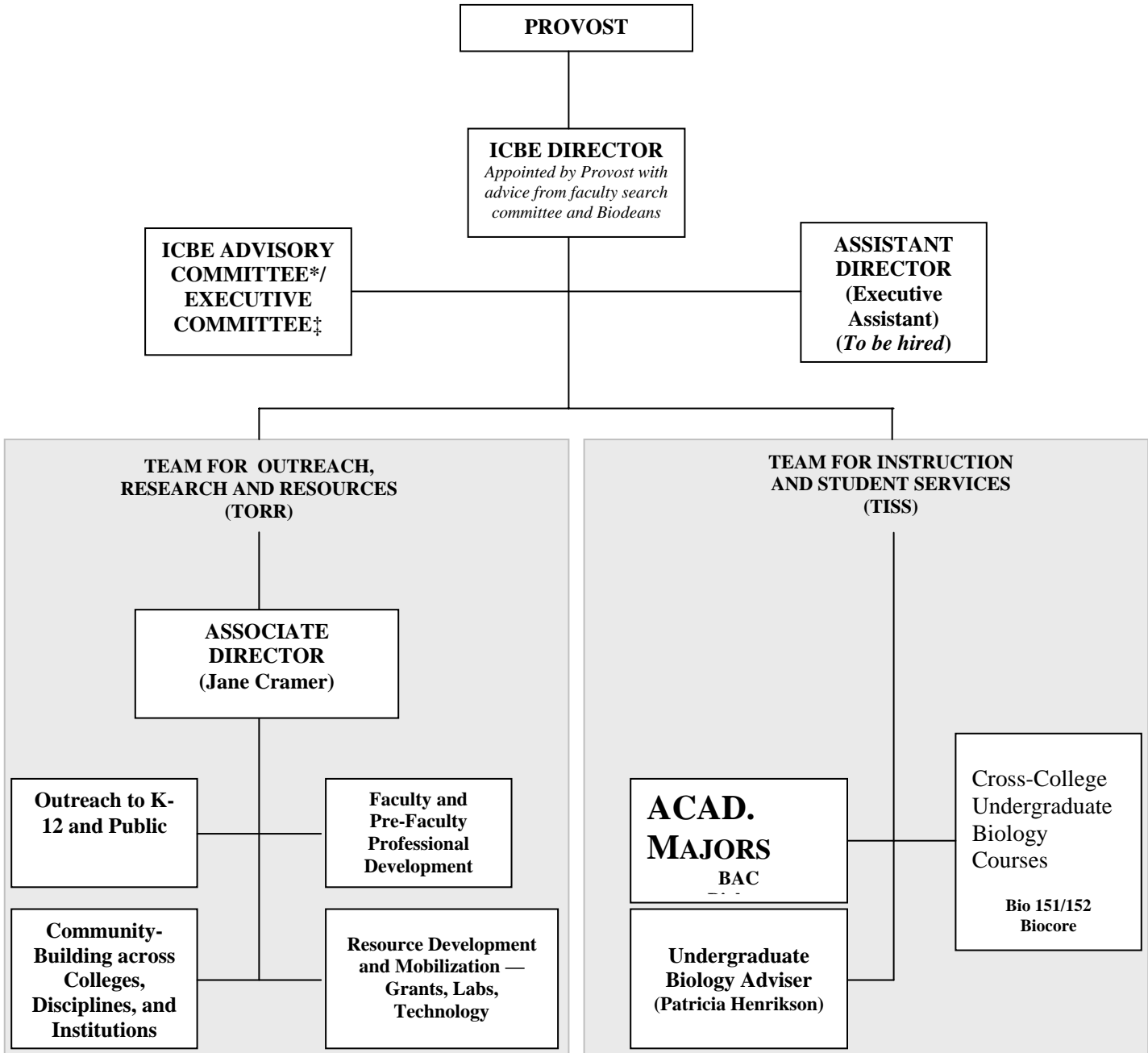
Name	Department	College	Role	Role	Role
Nancy E. Langston		Gaylord Nelson Institute for Environmental Study	advisor, Biological Aspects of Conservation Major		
Robert E. Bohanan	CBE	ICBE	instructor in Biology 152		
Janet L. Branchaw	CBE	ICBE	instructor in Biology 152, Biology 375 and Biocore 323		
Edward T. Bersu	Anatomy	School of Medicine and Public Health	Biology Major Executive Committee	advisor, Biology Major	
Grace E. Boekhoff-Falk	Anatomy	School of Medicine and Public Health	advisor, Biology Major		
Erik W. Dent	Anatomy	School of Medicine and Public Health	advisor, Biology Major		
Miles L. Epstein	Anatomy	School of Medicine and Public Health	advisor, Biology Major	instructor in Biology 152	
John F. Fallon	Anatomy	School of Medicine and Public Health	instructor in Biocore 333		
Anne E. Griep	Anatomy	School of Medicine and Public Health	instructor in Biocore 333		
Vjekoslav Miletic	Anesthesiology	School of Medicine and Public Health	advisor, Biology Major		
Paul J. Bertics	Biomolecular Chemistry	School of Medicine and Public Health	advisor, Molecular Biology Major		
KyungMann Kim	Biostatistics and Medical Informatics	School of Medicine and Public Health	advisor, Biology Major		
Nihal Ahmad	Dermatology	School of Medicine and Public Health	advisor, Molecular Biology Major	instructor in Biology 151	
Vladimir Spiegelman	Dermatology	School of Medicine and Public Health	instructor in Biology 151		
Amy R. Moser	Human Oncology	School of Medicine and Public Health	instructor in Biocore 333		

Name	Department	College	Role	Role	Role
Ajit K. Verma	Human Oncology	School of Medicine and Public Health	advisor, Biology Major		
Margaret J. McFall-Ngai	Medical Microbiology	School of Medicine and Public Health	instructor in Biocore 301		
M. Elizabeth Meyerand	Medical Physics	School of Medicine and Public Health	advisor, Biology Major	ICBE Steering Committee	
Erwin B. Montgomery	Neurology	School of Medicine and Public Health	advisor, Biology Major		
Carl E. Stafstrom	Neurology	School of Medicine and Public Health	advisor, Biology Major		
David H. Abbott	Obstetrics & Gynecology	School of Medicine and Public Health	advisor, Biology Major	instructor in Biology 152 and 375	
Ronald E. Kalil	Ophthalmology & Visual Sciences	School of Medicine and Public Health	advisor, Biology Major		
Arthur S. Polans	Ophthalmology & Visual Sciences	School of Medicine and Public Health	advisor, Biology Major		
Zsuzsanna Fabry	Pathol. & Lab. Medicine	School of Medicine and Public Health	advisor, Biology Major		
James S. Malter	Pathology & Laboratory Medicine	School of Medicine and Public Health	advisor, Molecular Biology Major		
Frank R. Greer	Pediatrics	School of Medicine and Public Health	advisor, Biology Major		
Ei Terasawa-Grilley	Pediatrics	School of Medicine and Public Health	advisor, Biology Major		
Peter Lipton	Physiology	School of Medicine and Public Health	advisor, Biology Major	Biology Major Executive Committee	
Donata Oertel	Physiology	School of Medicine and Public Health	instructor in Biocore 323		
Kevin Strang	Physiology	School of Medicine and Public Health	ICBE Steering Committee		

Name	Department	College	Role	Role	Role
Tom C. T. Yin	Physiology	School of Medicine and Public Health	advisor, Biology Major		
Jerome A. Dempsey	Population Health	School of Medicine and Public Health	advisor, Biology Major	Biology Major Executive Committee	
Chiara Cirelli	Psychiatry	School of Medicine and Public Health	advisor, Biology Major		
David F. Jarrard	Surgery	School of Medicine and Public Health	advisor, Biology Major		
Garet P. Lahvis	Surgery	School of Medicine and Public Health	advisor, Biology Major		
Judd M. Aiken	Comparative Biosciences	School of Veterinary Medicine	advisor, Molecular Biology Major		
Mark S. Brownfield	Comparative Biosciences	School of Veterinary Medicine	advisor, Biology Major		
Charles K. Henrikson	Comparative Biosciences	School of Veterinary Medicine	advisor, Biology Major		
Linda A. Schuler	Comparative Biosciences	School of Veterinary Medicine	advisor, Molecular Biology Major	instructor in Biocore 323	
Jyoti J. Watters	Comparative Biosciences	School of Veterinary Medicine	advisor, Biology Major		
Gary A. Splitter	Pathobiological Sciences	School of Veterinary Medicine	advisor, Biology Major		
Adel Talaat	Pathobiological Sciences	School of Veterinary Medicine	advisor, Biology Major		
Susan E. West	Pathobiological Sciences	School of Veterinary Medicine	advisor, Biology Major		

APPENDIX C1 – ORGANIZATIONAL CHART (AS PROPOSED)

PROPOSED INSTITUTE FOR CROSS-COLLEGE BIOLOGY EDUCATION



Institute for Cross-college Biology Education

APPENDIX C2 – ORGANIZATIONAL CHART (CURRENT)

Institute for Cross-college Biology Education

