

# Great Lakes Research Consortium Academic Program Assessment

**Prepared for Review and Approval by the GLRC Board of Governors  
at their May 2000 Meeting**

by the

## **GLRC Academic Program Assessment Task Force**

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## 1. Recommendations

1. The GLRC should develop academic programs aimed primarily at graduate and advanced undergraduate students. Courses should emphasize specialized research knowledge and skills, be multi- or interdisciplinary, be offered through a combination of distance learning technology or intensive residential sessions, and have little or no overlap with courses routinely taught at GLRC campuses.
2. Because a GLRC Academic Program can not be operated successfully without resources beyond tuition revenue, the GLRC should establish and fund a Task Force to write and submit proposals to organizations that fund projects or endowments for educational programs, particularly in science and environmental education.

## 2. Executive Summary

The Academic Programs Assessment Task Force was charged to determine whether or not the GLRC should and can effectively pursue developing academic programs for students and others throughout the Great Lakes Basin. The Task Force concluded that developing a high quality GLRC Academic Program is quite feasible if two constraints, one major and one minor, can be overcome. The major constraint is the considerable gap between the amount of funds generated by tuition revenue and realistic estimates of what it will cost to run courses involving multiple faculty and higher than usual support and supply expenses. To address this problem, the Task Force recommends that the GLRC aggressively pursue long-term, external funding sources to sustain a GLRC Academic Program. The minor constraint is to open clear communication lines among students, faculty, departments and campuses to ensure that students receive proper credit for GLRC courses and that members of each campus community are not threatened by a GLRC Academic Program. The Task Force believes the way to ensure this outcome is to have GLRC Campus Representatives become the conduits through which all GLRC and campus concerns about mutual academic activities are communicated.

A model GLRC course would have many of the following characteristics. It would be aimed primarily at graduate and advanced undergraduate students from GLRC and other campuses, but it might also be appropriate for faculty/staff and teachers. The course would be intensive and hands-on, blend theoretical and applied knowledge and skills, and be multi- or interdisciplinary in the sense of being taught by two or more faculty/staff from two or more campuses. Courses would be offered for 3-6 credits for 2-4 weeks in a summer or winter session or on week-ends during academic semesters. Distance learning techniques could be used to prepare geographically dispersed students for an intensive, residential experience. Because GLRC courses should be based largely on the specialized research expertise of those offering them, there should be little or no overlap with courses routinely taught on GLRC campuses.

Why should the GLRC and its member faculty and campuses pursue a GLRC Academic Program? The Task Force believes the answer to this question is simple. Doing what benefits students and faculty is *the reason* the GLRC exists, and survey results indicate faculty and students think GLRC courses are a good idea. Developing unique, high quality courses will serve students and faculty in ways not currently possible, so this is what the GLRC should try to do.

### **3. Introduction**

The purpose of this GLRC Small Grant project was to assess policies, procedures and mechanisms needed to implement an effective academic program utilizing the resources of the Great Lakes Research Consortium. The ultimate goal of this project revolves around the idea that students from GLRC and Great Lakes Basin campuses should be able to gain the best of what is available from faculty and researchers at GLRC institutions, including course offerings, research opportunities, and other experiences. However, this goal is difficult to achieve because the Consortium is comprised of state and private institutions, campus policies and procedures often are not conducive to inter-campus collaboration, and collaborative academic programs are not encouraged or, in many instances, possible due to institutional or financial constraints. What follows are the results of the Academic Programs Assessment Task Force's research and discussions, with input from the GLRC Campus Representatives, and our recommendations on processes and mechanisms to ensure that all member institutions have the potential to benefit from Consortium-sponsored academic programs.

The GLRC has offered several academic programs in the past with varying levels of success. The NSF-funded programs for undergraduate faculty enhancement were the most successful because the NSF provided substantial funding to pay multiple GLRC faculty competitive salaries while they worked to upgrade the science knowledge and skills of undergraduate teaching faculty from across the nation and to improve environmental science education generally. In the early 1980s, faculty from SUNY Brockport and SUNY Oswego successfully team-taught a Field Ecology/Environmental Analysis course to students from Brockport, Oswego and SUNY ESF, but little effort was made to reach a larger audience. In the early 1990s, the SUNY College at Buffalo offered graduate courses to students from all GLRC campuses, but those courses generally filled with Buffalo State students, who had registration priority, and few students registered from other campuses. Based on these experiences, it is clear that mechanisms must be developed to promote student access to GLRC courses and to adequately compensate the multiple faculty required to provide high quality courses.

### **4. Why Offer a GLRC Academic Program?**

The mission of the GLRC is, "to facilitate research and scholarship on Great Lakes-related issues, to provide opportunities for educating and training students, and to aid in disseminating information gathered through research." GLRC researchers at member campuses represent a broad pool of talent and resources relevant to Great Lakes' science, education and environmental issues. However, access by students and the public to this talent generally is limited to particular courses or programs on individual campuses. For the GLRC to achieve its full potential to provide opportunities for educating and training students and to aid in disseminating information gathered through research, as envisioned in the mission statement, ways must be found to move beyond the sporadic and small-scale efforts of inter-campus collaboration, aside from research, attempted in the past. Ways must be found to develop and provide long-term support for Consortium-wide collaborative teaching and training programs.

There are two major benefits of offering GLRC academic programs. (1) Students will have enhanced opportunities to take courses not available on home campuses that will broaden or deepen their backgrounds, to interact with scientists in their fields of interest re: potential graduate programs, prospective graduate advisors, and thesis committee members, and to learn new research skills or techniques. (2) Faculty will have enhanced opportunities to teach courses for diverse, high parameter students, to interact with and learn from other research faculty in team-taught courses, and their students will have education and research opportunities not available on individual campuses.

## **5. Potential Populations to Serve**

Graduate and advanced undergraduate students and faculty at GLRC campuses interested in scientific, technical and environmental issues related to the Great Lakes are the primary audience. Students and faculty at other campuses in the Great Lakes Basin, teachers, and the general public also can be served by properly structured GLRC academic programs.

## **6. Institutional Constraints and Over-Coming Them**

This section is presented in a format of potential positive and negative outcomes of developing a GLRC Academic Program from the perspectives of students, faculty, academic departments and campuses. Potential solutions for problems identified by the Task Force, that might impede successful implementation of a GLRC academic program, are proposed.

### a. Student Perspective

#### Positives

1. Opportunity to take courses that will broaden or deepen my background.
2. Opportunity to interact with scientists in my field of interest re: potential graduate programs, graduate advisors, thesis committee members, etc.
3. Opportunity for courses not available on my campus or for courses given at more convenient times (e.g., summer/winter sessions, distance learning).
4. Opportunity to make up credit deficits or to accelerate my graduation time.

#### Negatives

1. Potential problems transferring credits back to my home campus.
2. Can not get graduate tuition waivers for summer or winter session courses.
3. Interference with traditional blocks of research/work time.
4. Will I be accepted if I apply?
5. Room and board costs.
6. Fear of the unknown.

#### Potential Solutions

1. Use distance learning in combination with intensive residential workshops.
2. For residential courses, give first priority for a fixed portion of class seats to non-home campus GLRC students until a certain date.
3. Develop resources to cover room and board expenses.
4. Develop a mechanism to apply tuition waiver credit to GLRC courses.

## b. Faculty Perspective

### Positives

1. Opportunity to teach courses for diverse, high parameter students.
2. Opportunity for my students to broaden and deepen their backgrounds.
3. Opportunity to teach courses of a very specific or technical nature (e.g., congener-specific PCB analysis) that would not have the necessary enrollment at my campus to be practical or warranted.

### Negatives

1. GLRC course duplicates or significantly overlaps my course(s) with these potential consequences:
  - a. Fewer FTEs and smaller class sizes compensated for by having to teach more courses/sections on my campus.
  - b. Offering a course on one campus replaces similar courses at several campuses (e.g., by using distance learning for standard lecture courses) and leads to a less desirable teaching assignment for me.
  - c. My job security and comfort is threatened.
2. Interference with traditional blocks of research time.
3. Very low salary for summer and winter session teaching, especially when split among several instructors.

### Potential Solutions

1. GLRC courses should be high-level, research/applications-oriented, technical, hands-on, and interdisciplinary courses for advanced students (e.g., ecosystem modeling, risk analysis), not lecture/lab courses taught routinely at most campuses (e.g., fish ecology, limnology, analytical chemistry).
2. Such courses for advanced, highly technical study warrant additional salary compensation for participating faculty beyond normal summer or continuing education course stipends.
3. Develop external sources to supplement funds available from tuition.

## c. Departmental Perspective

### Positives

1. Schools without strong Great Lakes or environmental programs will be able to provide a ready source of advanced courses to recruit, train or retain students, thus enhancing the home campus program.
2. Provide advanced students from established programs with state-of-the-art/ interdisciplinary learning experiences not available on individual campuses.
3. Opportunity for departmental faculty to attend GLRC courses for professional development and to enhance departmental teaching programs.
4. Opportunity for departmental faculty to enhance the potential for collaborative research projects with GLRC course faculty.

### Negatives

1. GLRC course(s) replace home campus course(s) resulting in fewer credits being completed in the home campus department (e.g., 18 upper division elective credits for undergraduate biology majors at Brockport), with potential impacts on FTEs, staffing, resources, etc.

2. Limits on number of graduate courses that can be transferred from other programs (e.g., 6 credits to the 30 credit MS program at Brockport).
3. Limits on the number of undergraduate courses that can be transferred from other programs (e.g., 20 credits into the 38 credit BS program at Brockport).

Potential Solutions

1. Only a few students from any department would be admitted to or attend GLRC courses each year, resulting in negligible FTE or associated impacts.
2. Develop mechanisms to ensure that departments contributing students to GLRC courses get some FTE credit or revenue for sharing their students.
3. Encourage faculty from consistent student-contributing departments to develop and teach interdisciplinary GLRC courses so that their departments benefit from FTEs or revenues.
4. Develop mechanisms which allow flexible review on a case by case basis of GLRC course credits transferred for MS and BS programs.

d. Campus Perspective

Positives

1. Enhanced collaboration among faculty teaching GLRC courses may lead to additional campus revenue by indirect cost returns from new extramural projects (e.g., 10 years of NSF funding for Undergraduate Faculty Enhancement led to additional research collaborations among the faculty).
2. Modest potential source of FTEs or revenues for campuses hosting GLRC courses from tuition, fees, room and board, etc.

Negatives

1. Potential for minor losses of FTEs or revenues in academic year or intersession courses, respectively.

Potential Solutions

1. Share tuition revenues received by the GLRC course-offering campus with student-generating campuses (e.g., for every 3 credits of tuition received, 0.5 credit returns to student's home campus).
2. Develop stable external funding sources to support GLRC course funding requirements beyond traditional contributions to courses from tuition revenue.

e. Summary

The lists above suggest that many positives and few negatives for students and faculty would result from establishing a GLRC academic program. The greatest downside to upside risk ratio appears to be for academic departments, while the downside of campus-wide effects of establishing a GLRC academic program appears to be negligible. Thus, the Task Force believes the GLRC should proceed to establish a long-term academic program.

How should the GLRC go about developing an academic program in a way that promotes the positives and reduces the negatives listed above? What follows develops the Task Force's ideas in detail, but the short answers are: (1) Faculty and students are interested in GLRC courses (see survey results below), (2) What benefits students and faculty is *the reason* the GLRC exists, (3) Only a handful of students from a campus would attend a GLRC course each year, so any FTE or financial losses would be inconsequential, and (4) A campus choosing to host a GLRC-sponsored course will gain recognition and some financial benefits.

## 7. Potential Models for a GLRC Academic Program and Courses

### a. Other Institutions

Jack Manno and his staff explored other consortia that have had experience offering academic programs, and found that several have been set up in the U.S. Most were formed for the purpose of increasing the number and range of courses available to students and increasing the pool of students to whom courses can be offered. Although there may be other research consortia that, like the GLRC is considering, share some courses, we have not had success locating them. Of the consortia we have contacted, the models have been of two types - a simple cross-registration method, or a more complicated Consortium degree program. The institutions that have employed cross registration, Virginia Tidewater Consortium for Higher Education and the Atlanta Regional Consortium for Higher Education, describe similar methods. Any students of consortium member schools can attend courses at another member school. The credits are issued from the student's home institution, and the tuition is paid to the home institution. There are rules as to how many courses can be taken through cross registration - no more than two for any semester, and no more than 18 credit hours for the entire undergraduate experience.

The Tri-College University Consortium in Fargo, ND and Moorhead, MN, offers two consortial degree programs - one undergraduate and one graduate. The students register on their home campus and special registrars work to see that the courses are available. No money is exchanged between the schools. Jean Strandness, Provost of this program says that "starting a new program on an inter-institutional cooperative basis is much more likely to be successful than an effort to merge two existing departments on different campuses." (Strandness, Jean T., "Cross-Registration and Joint Academic Programs," *New Directions for Higher Education*, No. 106, Summer 1999). She lists the benefits of this kind of collaboration: 1) A combined faculty produces a stronger, more diverse curriculum, 2) Participating institutions tend not to duplicate faculty expertise, so the program can be broader. Faculty can teach courses more often and still sustain research in their areas of specialization, 3) Institutions share costs, 4) Granting agencies and accrediting bodies, though they may have some initial questions, are inclined to regard cooperative joint programs very favorably, and 5) The paradigm of cooperation generates a creative mind-set in which faculty are likely to develop a strong *esprit de corps* and maintain an affirmative attitude so that, when problems arise in the cooperative venture, they seek proactive solutions. The TCUC uses cross-registration and joint degree programs as a recruiting tool. In their student guide, they advertise "triple the number of courses available." Among the other cooperative consortial efforts in which TCUC has been involved are joint research ventures and seminar series, two activities well-known to the GLRC.

The Quad City Graduate Consortium, in Rock Island, IL, is comprised of 12 institutional members and currently offers over 70 graduate degree programs. The GradCenter administers the program and receives financial support from the Illinois Board of Higher Education and the Board of Regents of the State of Iowa. The GradCenter is governed by a board consisting of a representative from each institution and community representatives appointed by the Quad City Development Group. The classes offered are a mix of face-to-face, Internet and videotaped lectures; the amount of tuition is determined by the school offering a course.

After considering the models described above, the APA Task Force recommends that GLRC courses be developed, offered and administered in the same way as collaborative research projects are among campuses. 1) A team of faculty conceives a multi-disciplinary course and decides which campus is best suited to host it. 2) The GLRC campus representative coordinates contact between the host campus and the teaching faculty. 3) The host campus advertises and administers the course, and ensures that students' grades are sent to their home campuses. 4) The GLRC provides logistical support and coordination as needed. Ideally, the GLRC will develop a permanent source of funds to subsidize the extra costs of multi-instructor, residential courses.

#### b. What Would a Typical GLRC Course Be Like?

A model GLRC course would have many of the following characteristics:

1. Primarily for graduate and advanced undergraduate students from GLRC and other campuses, but may also be appropriate for faculty/staff and teachers.
2. Intensive, hands-on; blending theoretical and applied knowledge and skills; multi- or interdisciplinary; taught by two or more faculty/staff.
3. Offered as a 3-6 credit course for 2-4 weeks in a summer or winter intersession, or on week-ends during semesters.
4. Use distance learning techniques to prepare geographically dispersed students for an intensive, residential experience.
5. Little or no overlap with courses routinely taught at GLRC campuses; based largely on the specialized research expertise of those offering a course.

Such courses might include: Congener-Specific PCB Analysis, Fundamentals of Mass Balance Modeling, Environmental Impact Analysis, Bioenergetics Modeling in Fisheries, Big-/Deepwater Investigation Technologies, Wetland Science, Geographic Information System Uses in Ecology, Great Lakes Contaminants and Human Health, and others that GLRC faculty and students propose (see below) and create. It would be a mistake for the GLRC to teach basic courses that are taught on most member campuses (e.g., limnology, fish ecology, analytical chemistry, etc.). To attempt to do so will surely lead to resistance from faculty who would perceive, correctly, a threat to their teaching programs. Our niche is advanced, specialized, or unique courses, like those listed above, that can not be offered at most campuses.

#### c. How Will GLRC Courses Be Chosen?

Faculty wishing to teach a GLRC course would be asked to submit a proposal in the same cycle as the annual requests for Small Grants and other activities funded by the GLRC. Proposals would be reviewed by the GLRC Campus Representatives and evaluated by the criteria presented above, plus how responsive the proposed host campus is in keeping its fees down re: overhead, facilities, room and board, etc.

#### d. Where Will GLRC Courses Be Taught?

Model 1: One campus becomes a permanent host for GLRC courses. This campus would accrue most, if not all, of the revenue or FTEs generated by GLRC courses, and over time it would develop a streamlined system for implementing courses. This model might cause friction

in the Consortium, especially if more than one campus wished to host GLRC courses or if it was perceived that the host campus was drawing too many FTEs or dollars potentially available to other campuses. Loss of cooperation between campuses (i.e., not recommending GLRC courses to students or not giving credit for them) would doom any GLRC academic program.

Model 2: One campus becomes an administrative center to organize courses that could be taught at any campus. With the possible exception of the GLRC office located on the SUNY ESF campus, it is not clear why a campus would choose to do the work needed to organize GLRC academic programs without a guarantee of receiving financial or FTE benefits.

Model 3: Faculty proposing courses choose the campus that best fits course needs. Faculty teaching a course and the GLRC would work with the host campus to arrange meeting rooms, laboratory space, field equipment, transportation, room and board, etc. This approach would provide maximum flexibility for course faculty to choose the campus best suited for their course. The chief drawback is that each campus has different procedures for offering courses that the GLRC and the teaching faculty would have to learn each time a new campus hosts a course.

The Task Force believes that Model 3 offers the most flexibility for faculty teaching a GLRC-sponsored course, will benefit students the most, and is the least likely to create tensions among campuses.

#### e. When Will GLRC Courses Be Taught and How Will Students Register?

Model 1: Academic year courses. During the academic year, students from multiple campuses are widely dispersed. This is an ideal situation in which to employ distance learning technology to prepare students for intensive residential sessions that would take place on weekends or during academic vacation periods. In this model, students would register for Independent Study, Research Experience, etc. credit at the home campus(es) of the faculty member(s) teaching the course. No tuition money would be available to defray the residential expenses of a GLRC course offered during the academic year, although graduate tuition waivers would apply. Students or external funding provided by the GLRC would provide room and board expenses for residential portions of such courses. The teaching faculty would negotiate with their department head(s) for credit toward their teaching load in relation to the amount of time put into a GLRC course taught during the academic year.

Model 2: Summer or winter intersession courses. In this model, students from multiple campuses would register for a 2-4 week (3-6 credit) residential course at a host campus. A limited amount of distance learning might still be employed in the previous academic semester to prepare students for the course, but all students would register at the campus hosting the residential experience. No FTE credits result from intersession courses, but tuition revenue is used to provide faculty salary and other support. Intersession courses would have no impact on faculty teaching obligations during the academic year.

The Task Force believes that Model 2 would be the easiest to implement, but that Model 1 could work well under the right circumstances.

#### f. How Will Students Who Take GLRC Courses Receive Proper Credit?

The key to a student receiving proper credit for a course relies entirely on clear communication among the student, his or her faculty advisor, the academic department, and the Registrars at the grade-granting and grade-receiving campuses. GLRC-sponsored courses must meet criteria specified by the NYS Department of Education in terms of relationships among content, credits and contact hours. Faculty creating GLRC courses must design them with these requirements in mind, then GLRC Campus Representatives must communicate with faculty and department heads at their institutions to insure that there is agreement on which departmental requirements GLRC courses will meet. The Task Force anticipates, and survey results support, that campuses will freely award upper division major and graduate program credit for GLRC courses, for they will all be designed for these high levels of difficulty. In sum, students, their faculty advisors and GLRC Campus Representatives must work together closely to iron out the details of course equivalencies, credit transfers, etc. on each campus.

### **8. Financing and Comparative Costs**

#### a. What Will GLRC Courses Cost?

Assume that class size is 12 students and that on a weekly basis a GLRC-sponsored residential course would cost \$1200 in salary for each faculty member, \$500 in salary for each lab/field technician, \$1000 for supplies/facilities/vehicles/boats, etc., and \$250 per student for room and board.

The cost for a 2 week/3 credit course with one faculty member and one lab/field technician would be about \$9,400. Assuming the course was taught at a SUNY campus and that the class was evenly split between undergraduate and graduate students (all NY residents), this course would generate approximately \$5,700 in tuition revenue of which about 30% would be available to offset the expenses described above (K. O'Brien, SUNY Brockport Summer School Director, personal communication). Thus, the net cost for this course that must be supported by external funds would be about \$7,700 (\$9,400-\$1,700).

The cost of a 4 week/6 credit course with three faculty members and three lab/field technicians would be about \$36,400. Again assuming the course was taught at a SUNY campus and that the class was evenly split between undergraduate and graduate students (all NY residents), this course would generate approximately \$11,400 in tuition revenue of which about 30% would be available to offset the expenses described above. Thus, the net cost for this course that must be offset by external funds would be about \$33,000 (\$36,400-\$3,400).

#### b. How Will GLRC Courses Be Funded?

The Task Force has concluded that *the only* significant impediment the GLRC faces in creating and implementing a variety of unique, high quality courses is insufficient funding to support competitive salaries for multiple faculty, technical help to deliver courses, supply expenses, and stipends to support room and board costs for students attending residential courses. A number of avenues should be explored vigorously to solve this critical problem.

1. Grant applications for start-up funding for 3-5 years (NSF, EPA, DOE, FIPSE, etc.) followed by a more permanent financing solution.
2. A new budget line from SUNY.
3. A permanent appropriation from legislature as part of GLRC annual funding.
4. Endowment of a GLRC Academic Program by a private or public foundation.
5. Partner with federal/state agencies (e.g., EPA, DEC, DOH) and industries (e.g., Kodak, Xerox, Alcoa, Alcan, Reynolds, Occidental, etc.) that already provide internships, etc. for science, engineering, and math students and have environmental debts to pay. (Perhaps think of this as analogous to the Hudson River settlement where polluters paid \$100 million to set up the Hudson River Foundation. Also, why not consider industry scientists as potential instructors or students?)
6. The GLRC should also consider distance learning programs for teachers and the public and intensive sessions for teachers (e.g., along the lines of the defunct Decisions for the Great Lakes Program). It may be that some revenues generated from programs targeted for these groups can be set aside to defray costs of attending residential sessions offered for students by the GLRC.

From the estimated of costs above, if the GLRC was to obtain from the Legislature or SUNY the revenues needed to make an academic program viable, up to \$40,000 per year would be needed to offer two courses. If the GLRC is able to secure an endowment to support this initiative, capitalization would need to be in the \$400,000 to \$800,000 range, depending on whether net annual revenues from the endowment are closer to 10% or 5%.

## **9. GLRC Member Campuses Survey**

### a. Summary of Results

A survey was sent to approximately 300 people on the GLRC mailing list in February 2000, and the survey was distributed at the GLRC annual meeting on March 17-18. Responses were received from 49 faculty, 5 research staff and 23 students. Faculty responses came from individuals at the universities listed below; only four GLRC member campuses (Brock, Cortland, Geneseo, Waterloo) did not provide a response.

Albany (Bush, Rhee)  
 Binghamton (Chattergee, Montz, Whittingham)  
 Brockport (Haynes, Makarewicz)  
 Buffalo State College (Fraser, Riessen, Snyder)  
 Buffalo University (Baier, Boyer, DePinto, Meidinger, Rabideau)  
 Clarkson (Holsen, Shen)  
 Cornell (Gillette, Mills)  
 Environmental Science and Forestry (Donovan, Hassett, Limburg, Schulz)  
 Fredonia (Milligan)  
 Guelph (Whitely)  
 McMaster (McCarry)  
 Oswego (Chiarenzelli, Nelson, Rosenbaum)  
 Ottawa (Belizaire, Lean, Moon, Pick)

Plattsburgh (Franzi, Mihuc, Romanowicz)  
 Potsdam (Badger, Johnson)  
 Queens (Gilbert)  
 RIT (Vodacek, Waud)  
 Ryerson Polytechnic University (Luk, McCarthy, Twiss)  
 Toronto (Sprules, Zimmerman)  
 Vermont (Marsden)  
 Windsor (Ciborowski)

Responding faculty/staff suggested 44 courses they would like to develop, teach or have available for their students. A large majority of faculty/staff (87%) would encourage their students to attend and majorities would themselves attend(62%) or develop (61%) GLRC courses. Of the 21 campuses that responded to the survey, the median number of students per campus per year likely to attend GLRC courses was projected to be 1-2. This suggests that the GLRC could reasonably expect 21-42 students to apply for our courses each year, allowing the GLRC to offer 1-3, 12-16 student courses per year.

There is widespread agreement that stipends for room and board must be provided for students to make it possible for them to attend residential courses; 63% of the faculty and 52% of the student respondents indicated such support was required to attend. Interestingly, students were less concerned about costs than faculty. This difference may be accounted for in the differences in responses from students attending private vs. public campuses. Although not shown in the data below, students from private schools were much less concerned about costs than students from public institutions.

Very few departments are unwilling at this time to give undergraduate (12%) or graduate (6%) credit for GLRC courses, but many (44%, 53%, respectively) are unsure on whether or how to do so. A majority of campuses (59%) are willing to host GLRC courses. At this time, one campus will not promise to reserve seats in GLRC courses for off-campus students while two-thirds of the campuses will reserve seats, for a reasonable period of time, and one-third are willing to reserve seats but are uncertain how to do so.

In the survey, nine possible GLRC courses were suggested by the Task Force for consideration and ranking by respondents. Below are listed the percentages of faculty and student respondents (non-responses are excluded) who gave the courses high rankings (4 or 5). Before the GLRC is actually ready to offer courses, the Task Force recommends that a more extensive list of courses be developed (see the list below) for a new survey and ranking by faculty and students. Subsequently, the order of offering courses by the GLRC should reflect the preferences of faculty and students.

<u>Course</u>	<u>Faculty Rank</u>	<u>Student Rank</u>
Geographic Information System Uses in Ecology	1 (60%)	3 (65%)
Great Lakes Contaminants and Human Health	2 (53%)	2 (71%)
Mass Balance Modeling	2 (53%)	6 (45%)
Environmental Impact Analysis	3 (43%)	1 (75%)
Bioenergetics Modeling	3 (43%)	7 (39%)

Congener-Specific PCB Analysis	4 (41%)	5 (47%)
Wetland Science	5 (39%)	4 (50%)
Big-/Deep Water Investigation Technologies	6 (26%)	4 (50%)
Winter Ecology	7 (22%)	8 (32%)

Courses of interest listed by more than one respondent were:

- Ecotoxicology (4)
- Trace Metal/Trace Organic Sampling/Analysis in Various Media (3)
- Environmental Impact Analysis (3)
- Exotic Species Invasions (2)
- Great Lakes Environmental Issues (2)
- Great Lakes Fishery Biology (2)
- Phycology/Phytoplankton Ecology (2)
- Environmental Impacts of Remote Sensing (2)

#### b. Survey Instrument and Summarized Raw Data

##### Great Lakes Research Consortium Academic Programs Assessment Survey

The GLRC has charged our Task Force to determine interest in, need for, and mechanics of specialty courses that could be sponsored by the GLRC and offered at GLRC and affiliated institutions. After extensive discussions, the Task Force members believe a model course would have many of the following characteristics:

- Aimed primarily at graduate and advanced undergraduate students from GLRC and other campuses, but may also be appropriate for faculty/staff and teachers,
- Intensive, hands-on; blending theoretical and applied knowledge and skills; multi- or interdisciplinary; taught by two or more faculty/staff;
- Offered as a 3-6 credit course for 2-4 weeks in a summer or winter inter-session, or on week-ends during semesters,
- Use distance learning techniques to prepare geographically dispersed students for an intensive, residential experience, and
- Little or no overlap with courses routinely taught at GLRC campuses; based largely on specialized research expertise of those offering a course.

Examples of such courses might include: Congener-Specific PCB Analysis, Fundamentals of Mass Balance Modeling, Environmental Impact Analysis, Bioenergetics Modeling in Fisheries, Big-/Deepwater Investigation Technologies, Wetland Science, Winter Ecology, Geographic Information System Uses in Ecology, Great Lakes Contaminants and Human Health, and others that GLRC faculty and students can propose and create.

Task Force members have concluded that the significant impediment the GLRC faces in creating and implementing such courses is insufficient funding to support competitive salaries for multiple faculty, technical help to deliver courses, supply expenses, and stipends to support room and board costs for students attending residential courses away from home. The Task Force will make recommendations to the GLRC on how to solve this critical problem. As you answer the questions that follow, assume that the GLRC will find a way to resolve the financial resources issue.

SCALE:        5                    4                    3                    2                    1                    NR  
                   Very Useful                    Somewhat Useful                    Not Useful                    No Response

1. For the courses listed below, using the scale above, indicate which ones you would like to attend (student) or would recommend that students attend (faculty/other).

Proposed Course	Scale/# Responses	5	4	3	2	1	NR
Congener-Specific PCB Analysis (faculty)		3	14	5	6	13	11
	(student)	6	3	5	4	1	4
Mass Balance Modeling		7	16	12	4	4	10
		4	5	9	2	0	3
Environmental Impact Analysis		9	10	22	1	2	9
		10	5	2	3	0	3
Bioenergetics Modeling		6	12	12	6	6	9
		1	6	9	1	1	5
Wetland Science		7	11	15	8	5	6
		7	3	5	3	2	3
Winter Ecology		4	5	13	6	13	10
		3	3	7	3	3	4
Big-/Deep Water Investigation Technologies		6	5	15	9	7	12
		3	5	2	3	3	7
Geographic Information System Uses in Ecology		18	10	11	7	1	6
		8	5	6	0	1	2
Great Lakes Contaminants and Human Health		9	14	8	7	5	8
		7	5	3	1	1	5

SCALE:        5                    4                    3                    2                    1  
                   Required                    Helpful                    Not Needed

2. Respond to this statement using the scale above. For you to attend a residential course at another campus (student), or for a typical student from your campus to be able to attend a 2-4 week residential course at another campus (faculty/other), would require a stipend (~\$250/week) for room and board costs.

Scale/# Responses	5	4	3	2	1	NR
Faculty	16	17	13	0	0	6
Students	8	4	6	2	2	1

Questions 3-8 are for faculty/other only. Answer YES or NO. Explain as needed.

M/P/DK/NA/NR = Maybe/Probably/Don't Know/Not Applicable/No Response

3. GLRC-sponsored courses would be taught by faculty and staff doing Great Lakes-related research and teaching at GLRC institutions. Would you encourage your students to register for such courses? YES—45        NO—4        M/P/DK/NA/NR—3

If yes to #5, how many students per year from your institution would be likely to attend a GLRC-sponsored course (assume 1-2 courses per year)?

0-1: 9      1-2: 21      3-4: 7      >4: 5      NR: 8

4. Would your department allow credits given for a GLRC-sponsored course that meets standard content/time/credit requirements to apply toward undergraduate major requirements?    YES—22      NO—6      M/P/DK/NA/NR--22
5. Would your department allow credits given for a GLRC-sponsored course that meets standard content/time/credit requirements to apply toward graduate program requirements?    YES—21      NO—3      M/P/DK/NA/NR--27
6. Would your campus be willing to host a GLRC-sponsored course?    YES—30      NO—1      M/P/DK/NA/NR--20

If yes to #6, would your campus be willing to reserve some course seats, for a reasonable period of time, so that off-campus students could register?

YES—32      NO—1      M/P/DK/NA/NR—16

7. Would you or other faculty/staff be likely attend a GLRC-sponsored course to improve knowledge and skills for teaching or other purposes?    YES—32      NO—12      M/P/DK/NA/NR—8
8. Would you consider developing, either alone or in cooperation with other others, a course to be sponsored by the GLRC?    YES—30      NO—8      M/P/DK/NA/NR--13
9. What courses would you like to develop/teach, attend, or have available for students?
- Environmental Microbiology
  - Phytoplankton Ecology/Phycology (2)
  - Environmental Policy
  - Criteria/Indicators for Sustainability
  - Eco-/Environmental Toxicology (4)
  - Aquatic Food Web Dynamics
  - Great Lakes Physical/Hydrological Processes
  - Human/Mammalian Toxicity of PCBs, etc.
  - Global Transport of Chlorinated Hydrocarbons
  - Geochemistry of Aquatic Systems
  - Trace Metals/Organic Sampling/Analysis Techniques (2)
  - Environmental Engineering/Technology
  - Natural History/Biodiversity of the Great Lakes
  - Great Lakes Legal/Regulatory Frameworks
  - Algonquin Park Lakes Ecosystems
  - Environmental/Hydrological Applications of Remote Sensing Techniques (2)
  - Watershed Mass Balance Modeling
  - Ecological Risk Assessment

- s. Endocrine Disruptor Biology/Policy
- t. Analytical Methods to Determine Fish Growth
- u. Preservation, Restoration and Management
- v. Environmental Applications of Radio-isotopes
- w. Exotic Species Invasions
- x. Lake Champlain Limnology
- y. Benthic Biology
- z. Sampling and Experimental Designs
- aa. Great Lakes Environmental Issues
- bb. Field Herpetology/Natural History
- cc. Field Techniques for Great Lakes Environments
- dd. Chemical Speciation Modeling
- ee. Fluid Dynamics and Sediment Transport
- ff. Aquatic Photo-/Organic Chemistry
- gg. PCB/Pesticide/PAH Sampling/Analysis in Various Media (2)
- hh. Great Lakes Fisheries Biology (2)
- ii. Big/Deep Water Sampling Techniques
- jj. Environmental Impact Analysis (3)
- kk. Contaminants and Fish/Wildlife Health
- ll. Biofouling Prevention, Sanitation and Disinfection
- mm. Biomaterials for Limnologists
- nn. Mass Balance Modeling
- oo. Bioenergetics Modeling
- pp. Wetland Ecology
- qq. Quaternary History of the Great Lakes