

**Finger Lakes Community College
Muller Field Station**

Strategic Planning Workshop Report

November 14, 2006

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Executive Summary

The Muller Field Station (MFS) of Finger Lakes Community College (FLCC) has the potential to become one of the nation's best two-year institution field stations. A planning process funded by the National Science Foundation provides guidance for future development of research and educational programs, administrative and facility requirements, and strategic planning that will be necessary to achieve the potential of MFS. This report reflects the results of workshops held in November 2006 to address the enhancement of facilities and grounds, and to set the results of previous workshops addressing science programming and research potential in the context of an overall strategy for development of the MFS. Specifically the report discusses (1) mission and vision for MFS, (2) prioritized goals for research and education programs, (3) facilities that would be appropriate to support the research and education programs, (4) a suggested administrative structure within Finger Lakes Community College, and (5) a strategy for MFS development, with goals for five- and 10-year periods.

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Introduction

In 1999 Mrs. Florence Muller donated her home and 50 acres of her property, located at the southern tip of Honeoye Lake, to the Finger Lakes Community College Foundation. In 2000, she donated the surrounding 700 acres of wetlands to The Nature Conservancy.

The steep glaciated Honeoye Lake valley comprises one of the most dramatic areas in the Finger Lakes region of upstate New York. Honeoye Lake occupies most of the valley. However, at the south end of the lake near MFS is a long linear wetland that follows Honeoye Inlet as it flows into the lake. Biologists classify this wetland as silver maple-ash swamp, and it's one of the rarest and largest of its type in all of New York State. Silver maple-ash swamps have relatively little open water, and are predominately forested. At Honeoye, the swamp itself is dominated by silver maple, red ash, black willow and swamp white oak. Upland areas surrounding it are forested with large hardwood trees like sugar maple, red and white oak, beech, basswood, black cherry, and pignut hickory. This local environment surrounding the MFS provides FLCC students and scientists with the opportunity to undertake numerous investigations into conservation, biodiversity and management issues.

Currently the field station is limited to day use only. The lower portion of the home is used by FLCC as a natural recourse conservation classroom and laboratory for a number of College field study courses. The laboratory is underdeveloped and lacks equipment, instrumentation and telecommunication capabilities. The second floor is available for a conference and meeting space. Overnight accommodations are very limited. The site is also used for wilderness camping classes where students and faculty sleep in tents.

In 2003 a Fish Culture and Research Center was built through private foundation and New York State Education Department funding. This building has a fish culture area, classroom, workshop, restrooms and a storage room. Small ponds necessary to conduct a walleye research project in conjunction with the NYS Department of Environmental Conservation (DEC) are adjacent to the center.

In 2006 FLCC received a planning grant from the "Improvements in Facilities, Communications, and Equipment at Biological Field Stations and Marine Laboratories (FSML)" program of the National Science Foundation. The goal of the planning grant was to undertake a thorough examination of the programming, facilities, grounds and operational sustainability in order to expand the uses of the MFS. The lodging facilities, instrumentation, equipment, and telecommunication capabilities are not adequate in their current condition for visiting scientists to make observations or conduct research. Additionally, no attempts have been made to form partnerships with other educational institutions to support student exchange programs.

The planning grant funds enabled FLCC to host a "Scientific Research Workshop" on August 28, 2006 and a "Scientific Programming Workshop" on September 29, 2006. In November 2006 a panel of outside visitors with expertise in field station and marine laboratory administration and planning visited FLCC and MFS for two days to assist with the final two

workshops funded by the NSF grant: “Enhancement of Facilities and Grounds” (November 13, 2006) and “Strategic Planning” (November 14, 2006). This report summarizes the results of these November events.

I. Mission and Values

A. Mission Statement for Muller Field Station

At the Strategic Planning Workshop, participants discussed an appropriate mission for MFS. Everyone agreed that such a discussion was important in order to provide focus for what would be appropriate and inappropriate activities for the field station in the future.

The MFS mission must not be in conflict with the mission statement of its governing institution, Finger Lakes Community College:

"Finger Lakes Community College – an open-access institution, provides quality education within a student-centered college environment devoted to promoting long-term student success."

A consensus emerged around using the paradigm of “knowledge accumulation, knowledge communication and knowledge implementation”, thereby serving not only FLCC students but the larger community, especially local and regional policy makers.

A sense of place is part of the FLCC and MFS identity. The aquatic, terrestrial and historic features of the Finger Lakes landscape provide the foundation for all activities that take place at MFS. Participants agreed that serving FLCC students is the highest priority. MFS should be a center where discovery takes place, and where students and the larger community are exposed to scientific expertise. Dissemination of knowledge will be an important component of all MFS programs. Stewardship priorities can more appropriately be undertaken in partnership with other organizations whose mission is more directly related to conservation and stewardship, such as The Nature Conservancy and the NYS DEC.

Several sample mission statements emerged from the group after a two-hour discussion:

"MFS serves as a learning and research center to acquire knowledge and disseminate information about the Finger Lakes region."

"To serve, expose and advance high quality education, research and training to broaden the background of students, faculty and the Finger Lakes community."

"Education and research to promote understanding and appreciation of environmental issues and the unique natural resources of the Finger Lakes region."

“To provide scientific, experiential education and research opportunities to students and the community within the Finger Lakes region.”

“Provides quality education and research training opportunities within the community as well as contributes quality research for public use.”

As the field station develops it will be important to select a working mission statement that can service to guide activities for at least the next five years.

B. Vision

The vision for FLCC is:

“Finger Lakes Community College aspires to provide the highest quality education of which the institution is capable.”

This is a nice statement that applies gentle pressure in every activity at FLCC to strive to do the best job possible. The same vision applies to Muller Field Station. This FLCC vision statement articulates a strong appreciation for high standards. Other values emerged from the mission and values discussions at the MFS Strategic Planning Workshop that the group agreed should serve as sustaining principles for MFS activities. These include (in no particular order):

- Apply sustainable management practices to MFS land, facilities and programs.
- Participate in local, regional, national and international partnerships and networks whenever possible.
- Pursue and maintain programs of the highest quality, that are successfully peer-reviewed and from which the knowledge gained is as accurate and informative as possible.
- Strive for national prominence as a field station for two-year institutions.
- Sponsor programs that are creative, interactive, interdisciplinary and forward-looking.
- Study human relationships to the landscape, keeping in mind the human dimension.
- Heritage and legacy are important components of the Finger Lakes area.
- Assess learning outcomes, such as the degree of environmental awareness.
- Avoid politics.

As part of completing the mission and vision package that guides future development of MFS, a one-page narrative vision for the field station should be created that incorporates these values and describes MFS programs and facilities more specifically than does the appropriately brief mission statement. It is important that the vision statement reflect a consensus among FLCC administrators and MFS users, so the process of creating it should solicit responses and review by as many potential stakeholders as possible.

II. Programs and Facilities

A. Programs at Muller Field Station

The Muller Field Station will support a diversity of activities. Programs that are appropriate to MFS include research, education and public outreach efforts. It will be important to plan for a balance among programs. A vigorous and diverse research user community is the foundation for successful educational and research training programs. At least 30% of user days, and ideally 50%, at MFS should come from research projects. For a two-year institution such as FLCC, many of these projects will be supervised by faculty, and students will fill the role of research assistants. The next most important program area to receive resource allocation at MFS is FLCC courses. Training K-12 teachers in science-related skills and curriculum would be the third priority. Establishing what the relative percentages of user-days are is an important part of the planning process, because the percentages provide guidance over time for keeping focused on the priorities agreed upon through the mission statement, vision, and program goals discussions.

Creative efforts should be made to incorporate as many sectors of FLCC into MFS research and education efforts. Besides the traditional conservation, biological and physical disciplines, there are possibly faculty who might be interested in MFS opportunities in architecture, planning, Native American studies, geography, literature (poetry and place-inspired prose), fine arts, sociology, local and regional history, or agricultural economics. An efficient mechanism for examining the breadth of potential programs is to hold an informal FLCC retreat soon at MFS, to brainstorm the widest possible involvement across the college.

1. Research

Through the various planning workshops and discussions for MFS, research activities have emerged as the highest programmatic activity for use of the field station. Research meets the “knowledge discovery” paradigm that was articulated during the mission discussions of the Strategic Planning Workshop. Scientific investigation is the fundamental base upon which research training, education, experiential learning, and all other activities are based.

The following research goals are listed in priority order, as determined by the three workshops:

- a. Ongoing monitoring and assessment of the local MFS and regional Honeoye Lake environments.

Fulfilling this goal will require the establishment of basic monitoring protocols, and also effective management of the resulting data. There are protocols for field stations developed by the Organization of Biological Field Stations (OBFS) that are based on the Long-Term Ecological Research Network of sophisticated monitoring programs around the country. The OBFS protocols can be scaled down to a level appropriate for the resources (financial and

personnel) at FLCC. OBFS and NSF can be very helpful as MFS sets up its monitoring program.

b. Student research involvement.

In the opinions of visiting panelists, one of the most outstanding features of FLCC is the rigorous scientific education students receive. The emphasis on scientific inquiry, independent and team research projects, and proper training in scientific protocols is superb, and surely contributes to FLCC students being very competitive, whether they are seeking terminal degrees and entering the job market, or whether they are transferring to four-year institutions. Muller Field Station should become an essential part of this already high-quality research emphasis. Involving FLCC students in numerous and diverse research projects at MFS will create a stimulating intellectual environment, and also an academic heritage for FLCC that should bring national attention to the campus.

c. Peer-review of research projects and results when possible.

Having as a goal the review of research efforts by scientific peers will ensure the highest possible quality for MFS and FLCC research. This goal supports the mission of FLCC, and successfully achieving peer review will result in ever-better science at FLCC.

d. Publication of research results.

This goal follows logically from peer-review, and helps FLCC students and faculty become part of the national community of high-quality scientists. It is especially important to show that two-year institutions can produce competitive and high-caliber researchers because much of the future job market for the life sciences will be in the arena of sophisticated sensor instrumentation that supports massive and complex research efforts. Technicians who are highly trained and have conducted independent research themselves will be rewarded with excellent careers.

e. New grant-funded research initiatives, eg. NSF, REU, RET.

This goal is eminently achievable. NSF is very interested in the potential two-year institutions have for increasing the numbers of trained scientists and science technicians in order to meet emerging national scientific agendas, especially relating to climate change. A traditional field station such as MFS would be an excellent location for REU (Research Experiences for Undergraduates) and RET (Research Experiences for Teachers) programs. There are other NSF programs oriented toward community colleges. Another arena of potential grant funding is in experiential learning and curriculum development for research training courses. These programs are often found in the Informal Science Education division of NSF and other federal granting agencies.

f. Hosting visiting investigators.

Once the recommended facility improvements have been made, MFS would be an excellent place for visiting scientists to conduct research projects on the local and regional environment. The FLCC partnerships with The Nature Conservancy and with various New York state agencies will bring access to protected areas where long-term research can be conducted reliably. And the stimulating collegial environment that results from a field station with a diversity of scientists in residence would be invaluable for exposing FLCC students to careers in science.

All other MFS programs, whether education or training for FLCC students and K-12 teachers, or whether more directed toward public outreach, should build on the research projects that take place at MFS. In addition, the facility itself (land, utility systems and buildings) can be monitored and studied as a living laboratory for sustainable development.

In order to most efficiently and effectively coordinate research resources at MFS, some policies need to be developed for administering research efforts. These include:

- a process for application and approval of research projects,
- management of metadata about those projects and policies regarding access to actual data,
- the development of a research code that defines the nature of permissible research activities,
- the formation of a research committee to be proactive about research issues, and
- decisions concerning what research resources are provided by MFS on site for general use, and which (hopefully most!) will be brought by individual scientists.

A further issue is to decide what percentage of research use eventually shall be by visiting scientists. A critical mass of interacting investigators is necessary to generate the intellectual community of scholars that will enable the field station to achieve its full potential. In order to qualify for facility development funding through the National Science Foundation, a field station should eventually have at least 25% of its use come from outside the home institution. The benefits for FLCC are the cross-fertilization of intellectual content from a diverse community of scientists and cooperators. However, these users should not be subsidized by FLCC, but rather should pay the cost of their presence according to a fee structure that is designed for cost recovery. The disadvantage of encouraging too much outside investigator use of MFS is that there eventually might not be enough space for FLCC scientists and students. Whatever the ultimate space allocation might be, a policy needs to be articulated so that the research project admission procedure consciously addresses this issue. At this stage in the development of MFS such competition for space might seem unimaginable, but successful field stations can find their facilities overbooked with waiting lists in a matter of just a few years.

2. Education

At FLCC, research is a form of education, not distinct from it. Research and education activities take place on a continuum of “knowledge discovery” and “knowledge dissemination”, as was so effectively articulated by FLCC participants during the MFS planning workshops. Nonetheless, for the sake of effective discussion and policy-making, educational activities can be considered separately, as long as the awareness of the continuum remains.

The following education goals are listed in priority order, as determined by the three workshops:

a. Courses for FLC students.

This is the educational highest priority for MFS, and includes traditional FLCC classes and also opportunities for independent or group research, research training, and training in scientific technologies. Whether or not a FLCC course is appropriate for MFS should be considered in the broadest possible sense.

b. K-12 teacher training.

FLCC has a long tradition of close ties to public schools in the region, as a resource for teachers. Planning discussions for MFS resulted in this teacher training mission being elevated to the second-highest educational priority. There was the sense that MFS will be uniquely situated to provide time-efficient and creative programs for teachers to improve their science and math effectiveness.

c. Classes for students in grades 6-12 education.

Experiential learning in the field is ideally suited to students at these grade levels. They can indulge their curiosity within the rigor of testable scientific hypotheses, with the supervision and guidance of MFS faculty. The excitement of accomplishing field studies will produce educated citizens, and perhaps even students interested in research careers. One goal at many field stations around the country is to rise the level of scientific literacy for voters, because so much policy will need to be made in the future to address issues relating to compromised environmental quality.

d. Programs for business persons, nonprofit managers, policy-makers, etc.

This goal is appropriately placed fourth. It shouldn't be ignored, so that some small effort is made each year to provide workshops, research opportunities, or technical training opportunities for natural resource professionals at MFS. However, care should be taken that these programs remain a minority of MFS activity and don't overwhelm the higher educational priorities.

e. Hosting courses for other community colleges.

If space is available for other community colleges to offer classes at MFS, such classes would be an appropriate use of the field station. However, it might be better to create partnerships that allow students from other institutions to enroll in FLCC classes at MFS. Meeting students and faculty from other areas is a good goal, and during the first years of program and facility development the income generated from extra-institutional use of MFS would surely be welcome. It is easy, however, for these courses to persist and increase, and then demand high priority for space allocation, especially because classes are planned so far in advance.

f. General public outreach.

A few public events each year can be very beneficial in raising the visibility of MFS among the local community, and among potential donors. Hosting too many events can dilute the image of the field station and also absorb staff and financial resources that might better be expended on higher priority activities. Many field stations host an annual “field day” that involves hikes, canoe rides, small data collection activities, and presentation of research results. Having too many public programs can (and has!) easily overwhelm a field station in the early stages of development.

g. Classes for students in grades K-5.

Programs for elementary school children are the lowest priority for space and resources at MFS. Such programs might be appropriate once in awhile, but there are numerous other opportunities in the local area for this age group.

B. Facilities at Muller Field Station

1. Evaluation of Existing Facilities and Grounds

The visiting panelists toured the MFS building and grounds during the facilities workshop on November 13, 2007. They had the following comments, in no particular order:

a. General grounds issues:

- Traffic: the entrance seems very tight and might create problems for construction vehicles and loaded delivery trucks. Also, is paving an option? It would minimize dust and soil displacement, and be safer in inclement weather.
- Outdoor lighting needs to be improved throughout.

- Signs for handicapped should be the standard blue and white.
 - It is very nice to have a public pond that's not used for research and can be enjoyed.
 - Is having a hiking route along the canals for the public coming from state lands a good idea or not? If there is always someone on site at MFS, it might be OK. Trespass will happen though. A better idea might be to divert the public to a parking area to the north and keep the MFS grounds private.
 - Some signs are needed: name, logo, "no motorized vehicles"
- b. Water, septic and utility systems:
- The septic system is a traditional raised bed installation with a 49-person capacity. The nearby watercourses aren't monitored for possible contamination, but should be. How has the septic installation changed subsurface hydrology? Also, the field is very "in your face" and constrains use of that area of MFS considerably. Not sure if there are any alternatives.
 - The potable water supply is the "old" well, which has a bad taste and is untreated. The "new well" is artesian, high in iron and hydrogen sulfide, and shallow. It produces at 7-10 gallons per minute and is used to support ponds and also for sinks and the bathroom. It is not pumped. MFS should not attempt to use inadequate or nonpotable water. Most field stations qualify as municipal water supplies because of the maximum number of overnight visitors they can accommodate (even if they rarely host the maximum), and hence have to provide tested, treated water supplies. The alternative is bottled water.
- c. Channel building and area:
- Need better docks. Perhaps those at Flathead Lake could be copied.
 - Need a better boat and canoe launching ramp.
 - Need protected canoe storage. In general, it was painful to see FLCC resources left out in the weather throughout the MFS grounds.
 - The workshop/garage/storage building is located within the wetland buffer zone. This wetlands violation is **not good** for FLCC – the college should exhibit exemplary environmental behavior! Even if there is no technical violation, it looks pretty bad. This building should have environmentally benign uses, such as storage for boats and nontoxic field equipment.
 - Currently there is hazardous chemical storage and use in the shop building. It is unheated and these substances can freeze. They should be moved to a heated space.
- d. Fish lab building:
- Fish culture ponds are a good research resource.
 - Currently this building serves as a wet lab, classroom and office. Consider moving the office functions elsewhere, and broadening the teaching lab uses.
 - Also, consider renaming the "Fish Lab", even informally, to reflect more general uses. Possibilities: "Honeye Lab" "New Lab" "[Mrs. Muller's maiden name] Lab"
 - Finish the lab ASAP.
 - Are there state or federal regulations for a fish hatchery or lab? We suspect that federal Animal Care and Use regulations will apply. FLCC should investigate, and be sure the building meets all requirements. Field stations are frequently inspected by USDA Animal Care regulators.

e. Main house:

- Ultimately, as full development of MFS is achieved, this building should be the office/conference/meeting/lecture area, with administrative offices downstairs and upstairs meeting areas served by the kitchen. However, until housing is built at MFS, this main building will have to serve a variety of functions.
- For that reason, it should be improved to be a clean, basic, attractive space with neutral design and inoffensive furnishings.
- There appear to be no structural issues that would make remodeling more difficult or expensive.
- Insulate for year-round use, and re-side to replace deteriorating siding. Consider using siding that is more in the local architectural “vernacular” (lakeshore cottage?).
- External roof – could change the pitch. It isn’t necessary, but since FLCC would want to insulate the roof, a steeper pitch would both be more attractive, and provide for easier snow shedding.
- The geothermal system needs upgrading. It could be combined with hydronic baseboard heating or a lightweight concrete (“gypcrete”) in-floor heating system.
- Solar could be used for hot water and for photovoltaic power. Apparently there is some local expertise (“Eagle Mountain”?).
- Expand the deck on the south side.
- No more pink bedroom! Improve the bathrooms.
- The upstairs kitchen could be enlarged and reconfigured.
- Need access for wheelchairs at both doors.
- Keep the fireplace and the good wood paneling in the dining area.
- Get rid of the spiral staircase, carpet, carport, old lighting. Replace or reface the wooden beams (looks like they might be fake anyway).
- Remove the animal mounts from public areas. Some should be given to museums. Others could be added to the FLCC main campus collection. Some could remain at MFS to show students and visitors what animals look like that can be found at MFS (e.g. not the polar bear), if they can be stored properly out at the field station.

2. New Facility Needs

a. Housing

There is a great deal of potential for MFS to host extra-FLCC overnight visitors, especially teacher workshops. This use is in addition to the need for some FLCC housing for students and instructors, and for a few researchers. For planning, figure on accommodating 40 overnight visitors.

The visiting panelists recommend a separate housing area, with parking, water supply, septic systems, etc., on the flat area just where the driveway enters MFS property.

Housing should be flexible enough to provide privacy for couples, families and students. Sleeping units of small size (1 -2 people per room) are best, with private access to bath

facilities. Kitchenettes could be shared by 4-6 people. Private space is important for visitors, especially those visitors who reside at MFS for more than a few days. Large dorms would not be appropriate. Recent successful field station housing projects are more like small lodges, with six to eight private bed/bathrooms and a shared kitchen/lounge area. Some mechanism will be needed for food service, either through private or communal kitchen areas and/or a dining hall. One possibility is to contract for outside catering, using the main house to serve meals.

b. Other Facilities

This is a “shopping list” of facilities that would make MFS a fully developed site. Some of these needs are already met in some manner, and others could be combined with existing facilities.

- A good interactive website is an essential administrative “facility” for a field station.
- A Land Use Plan that zones the property, and shows what kind of research is appropriate where. For example, it might be appropriate to allow projects that involve extensive manipulation near the building areas, but farther away near the TNC reserve, only observational research would be appropriate.
- Detailed biological and physical inventories of the site and region, which will become a resource available for research and education programs.
- Reliable electrical supply.
- Screened porches.
- An outside amphitheater, possibly connected to a future nature center.
- Outside dining areas.
- Permanent dock, along the edge of the small peninsula (see example at Flathead Lake Biological Station).
- Launch ramp for boat trailers.
- Satellite communications and high-speed Internet connections.
- Equipment necessary to implement a long-term monitoring program, based on participation in existing and upcoming monitoring networks.
- Maps and a trail system, connecting in some fashion with the southern Honeoye Valley trail system. Boardwalks and an observation tower would be ideal (albeit expensive) components.
- A second research and teaching lab building, so more than one class can use MFS at a time. Small private spaces for researchers. Design with flexibility for configuration for different classes and functions, yet maintain an appropriate architectural vernacular.
- Research plots with guaranteed security for mid- to long-term projects.
- Appropriate shared lab equipment for student research. Scientists should provide their own equipment for the most part.
- Site security.
- Computer room for visiting researchers and short course use.
- Much more storage is needed, some for general use and also a private, lockable area for leaving items securely.

- Public reception space. Eventually this could be a small “nature center” located between the existing house and the new residential area.
- Library and collections facilities on a small scale.
- An inviting meeting area, with a fireplace or fire pit, that will encourage friendly interactions. The deck could be expanded for this purpose, but a pleasant area near the pond would also be nice.
- A medium-sized “flex-space” lecture hall to accommodate about 100 people, for public programs, seminars, guest lectures and meetings. MFS could be a very nice academic conference space.
- More storage, so that the workshop/garage can serve its function.

3. Facility Planning

A 20-year facility plan should be developed as part of the strategic planning effort. The first phase should encompass facilities that are large enough to accommodate a critical minimum of programs for 20 years. All functions that might take place at the MFS should be incorporated into the plan. Information from all potential users should be solicited early in the facility planning process. Some fundamental assumptions about MFS facility development might include:

- In general, flexible spaces that accommodate multiple functions will be better than large, use-specific structures.
- Opportunities should be taken to make the MFS an environmentally compatible facility. This would include energy efficient heating/cooling systems, water use, waste disposal, and so on. Green building and maintenance techniques should be used. There might be opportunities to provide examples of sustainable, appropriate building techniques that could be subsidized by corporations or foundations. Excellent examples exist for this type of engineering, such as the new Audubon building in New York and the Disney environmental center in Florida. The Bodega Marine Laboratory built a new lab facility incorporating many environmentally responsible features, and the Jasper Ridge field site at Stanford University built a "green" building housing many field station functions.
- Research facilities will be as cutting-edge and modern as possible, while keeping to a scale appropriate for the location and size of the potential user community.
- MFS facilities will be of high enough quality to encourage long-term intellectual and personal commitments to the field station.
- Attractive, moderate-scale buildings should be designed to reflect the local architectural vernacular of the Finger Lakes region. Development should be designed as a "farmstead", with separate buildings that are within walking distance.
- FLCC resources should be used to maximum benefit, such as architecture classes, environmental planning students, etc.

- A secure, clean water supply appropriate for domestic and research use should be guaranteed.
- Automatic, reliable back-up power should be provided for all instrumentation and laboratory facilities. Maximum connectivity should be available for MFS users.
- Existing MFS facilities have suffered from “deferred maintenance”. A capital improvement plan and budget should be formulated that outlines an annual financial contribution from FLCC so that maintenance can be accomplished proactively.

C. Environmental Monitoring and Data Base Management

An explicit program for long-term monitoring biological and physical variables at the Muller Field Station and surrounding area will be required for future scientific credibility, for access to funding, and to provide information resources visiting scientists. The visiting reviewers were impressed with the potential of MFS to serve as a regional center for biodiversity research and education, especially for studies that examine the effects of past and potential future landscape change. The excellent potential for engaging FLCC students in such programs was also evident.

1. Monitoring Program

When a long-term monitoring program is established, FLCC students and other MFS program participants can realize numerous benefits. Students would be exposed to the basic concepts underlying the monitoring design and protocols/methods, would have the opportunity to engage in the actual measurements, and have access to the data to examine and analyze trends. The data could also be analyzed with other sites for regional or national comparisons.

Students could be used to periodically sample permanent plots, transects, ponds, or stream reaches for a wide range of biological and physical variables. Some possibilities include: permanent vegetation plots that explore successional change; piezometer arrays to sample season trends in depth to water table and soil solution chemistry; a network of black-light traps to examine seasonal habitat use by moth species; motion-sensitive camera points to document seasonal habitat use by wildlife; a carefully selected set of photo points that could be reshot at intervals and used with aerial photos to document changes; and a meteorological station.

Due to the same funding and staffing limitations that affect most field stations, the long-term monitoring program will need to be carefully designed. The ideal program will examine a set of potential variables and select a small subset that best intersects the nature of the land base, the resource limits of the MFS and FLCC, the land management needs of various interests in the local area, the educational value to students and the public, and the interests of future researchers. Consideration should be given to cooperating with on-going monitoring programs

at other regional sites by other institutions and agencies in order to provide complementary data for spatial analyses.

Because of resource limitations and the inherent difficulty in maintaining continuity in any long-term measurements program, the monitoring at MFS should be kept as simple as possible. When equipment is used it should be reliable, the sensors should not require frequent calibration and maintenance, and the data stream should not involve a great deal of hands-on work for quality assurance and quality control (QA/QC). The opportunity to work with science students at FLCC and the local high schools argues for substantial involvement by students in the collection effort and this will constrain the types of sampling possible. Students and the general public normally have limited taxonomic and laboratory skills. Hence a great deal of guidance and continual engagement by faculty or MFS staff is required to ensure quality control.

While the field station should be the primary location for the monitoring stations/sites, other locations in the vicinity might be considered if they offer better sampling conditions and are secure (provide long-term assurance of protection).

The monitoring program at MFS should also be designed with broad engagement of all users, in order to ensure long-term support. Responsibility for centralized data management of the overall program should accrue to the Director, who would work with the future Scientific Technician to ensure a smooth data stream, QA/QC, ready access, and secure archiving. Strong consideration should be given to web access of the data. This will be essential for any NSF support of the field station and its programs.

Resources exist that describe methods and protocols for many environmental variables. The NSF's Long-Term Ecological Research (LTER) Network Office is a good source of information about methods used within the LTER program (<http://lternet.edu/>). The Organization of Biological Field Stations (OBFS) has formed a partnership with LTER to begin compiling information on monitoring methods and protocols, and provides training in data or information management with a heavy emphasis on QA/QC and archiving.

There appear to be opportunities to engage MFS with other institutions and agencies that share common interests in regional studies. These partners could provide financial support as well as expertise for regional long-term studies in biodiversity or landscape change. Several agencies have mandated monitoring programs and may have sampling sites in the region that could contribute to a monitoring program. Such partnerships would need to be carefully evaluated so as not to compromise the field station or its programs.

Toward the goal of MFS becoming a regional center for the analysis of biodiversity and landscape change, agencies such as the National Park Service (NPS) and USGS should be approached as well as NGOs such as The Nature Conservancy and Audubon Society or others to explore possible development of a consortium to manage and share long-term data of common interest. This data banking function is an ambitious undertaking, but could have major benefits for FLCC and the field station in terms of opportunities for research, education and the development of regional prominence.

As a data bank, FLCC students might take on the acquisition of agency or NGO data sets and their management and archiving, either individually or as a class project. This could be under the supervision of a faculty member that uses the field station, or possibly by someone in the FLCC Computer Science Department (or whatever college unit handles data/information management). For example, a student under Dr. Gilman's guidance might compile all the discharge data available for the stream gauging stations on Honeoye Lake or nearby sites and put them into a readily accessible and usable form for other students. Data from a diversity of federal and state agencies could be added to a data bank that helps place other studies in context or fleshes out a regional set.

With the development of meeting and educational facilities at MFS will come the opportunity to offer workshops and other educational offerings along the themes of regional biodiversity patterns and consequences of landscape change. The monitoring program could be designed in a way that cements partnerships with regional institutions, agencies and nonprofit organizations by hosting regular workshops.

Development of a monitoring program is an ambitious goal that will require careful design and organization to be achieved. Responsibilities for policy development, implementation and operation may need to be distributed among participating FLCC faculty but could be overseen and orchestrated by the Director.

2. Information Management

When a research policy or code is developed for Muller Field Station, it needs to state clearly that research builds on information collected by previous scientific efforts, so there will be a formal requirement to deposit data sets at MFS for use by others in the future. Field station programs will continue to yield valuable data sets, photo images, maps, and other information that need to be archived online for future student, researcher and general public use. Also, information acquired from other MFS projects, such as oral histories, natural history surveys, historic land use archives, etc. will become a very valuable resource that will enhance research and educational projects.

The following recommendations focus on three aspects of information management at MFS:

- a general data policy;
- establishing a data stream for the monitoring program at MFS; and
- roles and responsibilities for overall data/information management.

a. Data Policy

The field station is currently at a crucial point in its development with regard to information management. If a clear, firm information management policy is developed and instituted now, it will yield a future system that will provide information to users and a

structure to acquire the information from those who collect it. This will minimize conflicts with field station users who often are not informed of data policies until after projects are underway or completed. Having a data policy that is reached by consensus and posted online for field station users is crucial to a successful, long-term information management system for MFS.

The primary considerations for development of a data policy are:

- Project registration. It is very important to require field station users to register their projects before they are started. This may include a site use form that can be easily placed online as a first draft of the metadata for a project (see linked example below).
<http://coweeta.ecology.uga.edu/webdocs/meta/ronsitemeta-form.html> (form)
http://coweeta.ecology.uga.edu/webdocs/1/metatdata_home.html (metadata)
- Data ownership. The policy needs to clearly state if the data policy pertains to all research projects at MFS or only those with funding from a certain source, e.g. faculty from FLCC vs. those with public funding vs. all investigators (this would be easiest to enforce).
- Length of time until public data access. Information may be collected from investigators at any time, but may not be made publicly available until a certain time after data collection ceases. The National Science Foundation has a timeline of two years for this time frame.

b. Data Stream

The monitoring program will not achieve its full potential without a well established protocol for data entry, quality assurance/quality control (QA/QC), adequate documentation about the data sets (metadata), accessibility, and secure archiving. This collective set of activities is sometimes referred to as the data stream. Protocols should be implemented that make this overall process as simple and foolproof as possible.

c. Roles and Responsibilities for Information Management

Data management does not happen without a significant investment of resources. Eventually, one person should be responsible for the overall data and information management activities. Having a full-time data manager is probably an eventual goal, but an expensive one. Prior to that, a data/information management committee could be formed to sort out the roles and responsibilities necessary to accomplish the desired end. This committee should initially meet at frequent intervals to develop a collective understanding of the tasks and also to evaluate progress. The MFS Director might have some oversight responsibilities for data/information management, but this should not be a major responsibility of that position. In other words, he/she should not be the data manager.

III. Process for Development of Muller Field Station

A. Proposed Administrative Structure

The visiting panelists strongly urge that a Director be appointed for Muller Field Station immediately. This position should be placed as high within the administration of FLCC as possible, reporting directly to the Dean of the College. This would be an excellent administrative home for MFS, instead of it being governed through any specific department. The greatest advantage is that the field station will be available to the broadest FLCC community, rather than being seen as a department resource for biology, conservation or environmental science.

Here is a recommended staff model that should work well for at least the next five years of MFS development:

1. Director

Finding the right person for this position will be the single most important contributor to the success of MFS. The panelists urge FLCC to consider appointing Dr. Bruce Gilman to this position. We usually suggest a national search to find a mid-career scientist who is skilled at long-term visioning and especially at devising a critical path and following it successfully. The successful candidate would be a good listener, would be imbued with an entrepreneurial spirit and would be experienced at forging effective relationships with agencies and collaborators. A mid- or late-career Ph.D. scientist would be desirable, although the right combination of research experience, creativity, wisdom and maturity might be found in someone with a different professional degree. Extensive familiarity with marine laboratories, field stations, education centers, field research, and formal and informal scientific and natural resource education programs should be required. And at the end of a national search for the right person, there would be no better candidate than Dr. Gilman.

Normally the responsibility of administering a field station would require a full-time commitment. However, with skilled administrative assistance, it is possible to have a .5 FTE Director who continues with some teaching responsibilities, especially if those courses are centered at the field station.

Duties of the Director include:

- Spearheading the planning process;
- Devising and implementing programs and facilities;
- Implementing the strategic plan;

- Securing funding for operations and capital construction;
- Supervising facility construction and renovation;
- Identifying and driving a research agenda;
- Operating MFS in a financially responsible manner;
- Hiring and supervising whatever staff and consultants are necessary to accomplish these tasks; and
- Representing MFS to the local, regional, national and international scientific community and general public.

2. Other Staff

The following positions reflect roles that need to be filled. It would be possible to combine some roles into one staff person. Other creative job-share arrangements might be made within the FLCC community.

a. Administrative Manager

This should be a half-time position, located on campus. This person would handle paperwork for all station activities, including accounting, secretarial duties, correspondence, and scheduling requests for approval by the Director. There will also be tasks related to hosting possible donors or funders, including government officials. As use of MFS increases, and especially once housing is constructed, this position should become full-time.

b. Resident Facility Manager

This position needs to be filled soon. Eventually the resident manager will need to be permanently on site to ensure consistent and secure oversight of MFS. This person needs to be flexible enough to do mundane chores and sophisticated enough to provide good service on-site for various program needs. A local hire should be sought if at all possible. The position can be half-time for now, although the backlog of deferred maintenance could be more effectively addressed with a full-time position. Once construction of new buildings begins this should be a full-time position. Specific duties include: maintain the facility, provide or supervise custodial activities and handle emergency repairs, power outages, safety problems, etc. Having this person hired before significant construction begins and letting them participate in the construction oversight process is highly recommended, since they will have full knowledge of the various buildings' inevitable idiosyncrasies and can handle future maintenance and trouble-shooting much more effectively.

c. Finance Manager

Most likely the Administrative Manager can perform most of the "shadow accounting" tasks needed to manage MFS finances in conjunction with the FLCC finance office. However, at some point as use increases it is likely that MFS finances will be too

burdensome for the Administrative Manager. There will be cost accounting and reporting related to numerous sources of funds, including government grants. The entire package of fundraising and construction for any new facilities will require careful cost management. A part-time Financial Manager should be hired or a consultant's services should be secured.

d. Program Manager

Gradual program growth will mean the addition of a part-time Program Manager, once enough programs are in place that the Administrative Manager can no longer handle the volume. Duties would include conceptualization and design of programs, and hosting programs that others conduct. Perhaps this position could be combined with a junior or adjunct faculty appointment.

e. Scientific Technician or Data Manager

The need for this position depends on the monitoring programs that take place at MFS. Once a monitoring program begins, perhaps a part-time student could coordinate the program. However, the need for a full-time data manager is likely to occur fairly rapidly. Overhead costs of a data management program are usually 15-20% of overall facility costs at field stations. Fixed costs are substantial but a lot of data volume can be handled by one person, with student assistance when necessary. Perhaps someone in the Biology Department or Computer Sciences would like to supervise this program to begin with, maybe even for faculty release time.

B. Advisory Committees

Many field stations find advisory committees useful, and incorporate them actively into planning and decision-making processes. The panel recommends the following advisory committees for Muller Field Station:

1. Science Advisory Committee (SAC)

This committee is often charged with addressing policies and operational procedures relating to research, education and research training programs. A SAC is usually composed of two or three local or regional members, and two or three from the national stage, chosen for experience and diversity of viewpoints. The SAC meets twice a year for the first few years, and then perhaps annually as programs mature. Specific topics are discussed at each meeting in a formal agenda rather than encouraging general, unfocused discussion. Field station directors have found SACs to be extremely useful internally in many ways, especially when used proactively to address issues before they become problems.

2. Citizens Advisory Committee (CAC)

This could also be a "Friends" group, but having the word "Advisory" in the name conveys a more dynamic role. The committee is usually composed of about eight members. The CAC meets twice a year.

Whenever the SAC meets, an opportunity is usually provided for both the SAC and the CAC committees to mix together for informal discussion. The formal charge to both committees is proactive, perhaps addressing sections of the Strategic, Business or Academic Plans on a rotating basis. It is critical that both committees be formally constituted, formally charged with topics to cover, and their input formally received and incorporated into planning for the field station. The tendency is to let the committees lapse until there is a crisis and then try to convene them, resulting in poor policy and resentment from committee members who feel that their generosity of time and attention is abused.

3. Research Committee

A Research Committee should be appointed by the Director as soon there are more than 10 faculty-level research projects taking place annually at MFS. This committee would have the responsibility of drafting a research code, reviewing and approving requests to use the field station, and addressing potential research conflicts. Members would also assure compliance with any rules for using leased research lands, sampling or collection permit requirements, animal care and use permits, hazardous waste disposal procedures, etc. Policies that set priorities for station use and access to equipment or personnel resources would also fall under the committee's purview. Often a committee of three to five works best, with at least some members not conducting research at the field station so as to avoid conflicts of interest. Having such a committee structure and policies in place gives potential researchers contemplating a career investment in the field station a measure of comfort that their commitment will not be threatened. All Research Committee recommendations would be given to the MFS Director for final adoption and implementation.

4. Finance and Development Committee

A fourth committee can be very useful, especially during the growth phase of a field station or marine laboratory. This would be a "Finance and Development Committee", with appropriate professional, experienced members who would assist with providing the financial resources necessary for achieving goals articulated during the planning process. It is only useful to convene such a committee if there are people available with significant contacts and experience who are likely to produce results, not just cogitate or make recommendations for work that they expect others to perform.

C. Reasonable Five-Year Tasks

1. Appoint a MFS Director.
2. Clean up the Channel Building and Main House areas and protect FLCC materials.
3. Investigate and implement Animal Care and Use policies related to MFS activities.
4. Hold a retreat at MFS for FLCC faculty and administrators to brainstorm maximum use of MFS across the college.
5. Set up MFS governance and administration structures. It is important that these be efficient and stream-lined, without unnecessary duplication, with easy communication, and with as few bureaucratic road blocks as possible. Items needing attention include:
 - Complete the planning process: approve a Strategic Plan, make a Business Plan, Facility Development Plan, Capital Improvement Plan, Academic Program Plan. These all evolve from the 2006 workshops and are written by the Director with help from advisory committees. They should be very brief, and set goals into a timeline, with general budgets.
 - Communication methods: set up an interactive website with forms and policies, etc.
 - Review (and revise if necessary) governing documents for MFS, MOUs, policies for use, etc.
 - Set up MFS as a FLCC financial cost center.
 - Convene advisory committees. Many of the people who participated in the 200 workshops would be excellent candidates.
6. Maintain and improve trails, roads, docks, and complete a zoning plan for accommodating a variety of land uses for research, teaching and administration/operations.
7. Hire an Administrative Manager.
8. Hire a facility manager for MFS who has reasonable handyman experience and good interpersonal skills.
9. Complete the Fish Lab (“New-Name Lab”) improvements. Move the office functions to the Main House. Conduct Main House renovations as listed in the facility evaluation section above.
10. Find a solution for the Channel Building functions that aren’t appropriate for the wetland environment.
11. Complete the establishment and implementation of an environmental monitoring program.
12. Create a development package with a case statement and visual materials, to use to solicit funds for capital improvements (renovations, housing, lab/classroom and nature center).

13. Apply for at least one NSF FSML grant to secure funding for renovation or construction, based on what comes first in the Facility Plan. Complete the construction of these improvements.
14. Continue current research programs, and strive to add at least three more each year, with at least one coming from outside FLCC.
15. Host at least 10 educational programs each year, and add one or two annually, with at least three coming from outside FLCC.
16. Develop the preliminary site plans and architectural renderings that will support a capital campaign for housing construction, and begin fundraising.

D. Reasonable 10-Year Tasks and Beyond

This longer time horizon is somewhat fuzzy at present. Appropriate goals will become clearer as use of MFS increases. Nonetheless, it is reasonable to assume the following can be accomplished:

1. Housing for 40 overnight visitors has been constructed.
2. A small nature center or other public interception/interpretation center has been constructed.
3. At least 20 courses use MFS annually, with 25% coming from partners outside FLCC.
4. MFS is involved in regional biodiversity/environmental monitoring initiatives.
5. At least 20 research programs led by faculty scientists are hosted each year, with 25% coming from outside FLCC. In addition, at least 40 student research projects are conducted annually.
6. FLCC has a national reputation as a leading two-year institution providing high-quality research training opportunities to its students. Evidence includes at least one NSF award for research training activities, such as a Site REU award or a RET award.
7. Diversity of MFS programs and students is increased, reflecting the local and regional Native American heritage, particularly relating to the environment and natural resources.
8. At least one national meeting has been hosted by MFS (topic of their choice!).
9. At least two teacher-training courses are held annually as part of an experiential learning program developed with multiple local and regional educational partners.

IV. Funding

While a field station can be a tremendous resource for a college, it can also be a significant financial obligation. Annual operating costs are commonly about \$250,000 at full development for a field station of the potential size of MFS. The minimum annual cost to expect is about \$150,000. There will also be a significant capital expenditure to bring the physical plant up to a condition that allows for the establishment of sustainable research and educational programs.

Those very few field stations that are financially self-sufficient are completely independent of any sponsoring institution, and have a great deal of difficulty sustaining healthy programs over time. The commitment by FLCC to provide annual funds for the field station is a powerful tool for programmatic development through subsidizing programs in their initial phases of growth. Budgeting and cost-centering for MFS must be maintained by the Director's office in order to know real operational costs and to make deliberate decisions about cost recovery, setting fees, and subsidizing different programs.

A. Costs

It appears that the hiring of a director, part-time administrative assistant, part-time resident manager, and part-time data manager will result in start-up costs of about \$150,000 annually for the first few years. Perhaps some flexibility exists to use existing FLCC positions to reduce this cost.

Some specific financial recommendations for MFS include:

1. Cost-centering. What are the primary activities at the field station? What are all of the expenses and income associated with each of these? A cost recovery profit/loss plan for each cost center should be generated and continually refined. Appropriate fees designed to recover costs can then be set for each service the field station will provide. (See the OBFS Operations Manual for an extensive discussion of field station cost centers.)
2. Bench and station use fees should be charged for visiting researchers, and also for any FLCC researchers who have received NSF or other grants. These fees are entirely legitimate, and in fact not charging them means that general administrative financial support is subsidizing specific grant-funded research projects. Since fees will be set knowing the actual costs, each grant received by an investigator should pay the full cost of conducting research at the field station. The resulting fee structure can then be used by researchers during the grant application process, so project budgets include appropriate amounts once the grants are received.
3. Budgets should be developed proactively as a planning tool for each MFS program and then combined into an overall MFS budget. Budgets received from FLCC are only reporting tools, and should not be a substitute for site-generated budgeting.

4. Development of a financial plan and timeline should be undertaken as soon as possible, as part of the overall strategic planning process. A traditional business plan should be developed for each activity, showing projected expenses, potential users, anticipated income, and projecting that point in the future where income covers expenses. Each of these business plans and timelines can then be assembled into an overall financial plan.
5. Any research, educational or other program activity at MFS should be thoroughly understood as to its financial basis and implications. The funding source for each activity should be identified, and a plan should be developed for what action should be taken if that funding source disappears. When research grants are gone, what happens to the staff and equipment supported by those grants? Conscious decisions should be made if other sources of funding are going to subsidize specific programs. These decisions need to be made in advance as part of the overall strategic planning process. It is likely that most of the use of MFS will be by students in FLCC courses as part of their degree requirements. These costs will be legitimate FLCC expenses, but their amount should be known so that the financial contribution FLCC makes each year can be quantified. This information is required by NSF and other granting agencies, to prove that the home institution appropriately supports a field station.
6. The NSF Field Station and Marine Laboratory (FSML) competition is a viable source for future facilities funding. However, in order to be competitive MFS needs to have a greater percentage of visiting scientist research, and also needs to develop a functional, integrated information acquisition and management program. The Program Officer for the NSF FSML facilities competition recently stated that three things make a field station notable (and hence eligible to receive federal facilities funding):
 - use of the facility by members of the national community, as evidenced by user days from outside the field station's sponsoring institution;
 - publication and other kinds of dissemination, on a national basis, of the results of research and scholarly activity conducted at the field station; and
 - national access to data generated at the field station, through the publication or electronic availability of that data.

These standards are modified for field stations and marine laboratories belonging to two-year institutions. Recently NSF has elevated community college field research installations to a high priority for the research training those facilities can provide in order to meet emerging national scientific agendas. Inquire at NSF for information about all of the diverse programs for which FLCC and MFS will be eligible.

B. Fundraising

There is significant successful fundraising expertise within FLCC and the Canandaigua community. Once program, business and capital improvement plans are developed for MFS, fundraising resources should be utilized on behalf of MFS to the fullest extent. Any capital

improvements sought for MFS should be part of a FLCC capital improvement campaign. Annual giving of some amount should be directed to MSF.

Some suggestions for enhancing the likely success of fundraising efforts include:

1. Perhaps funds for capital improvements to the farmhouse could come from state historic preservation funds.
2. A brief statement of the MFS vision and some nice conceptual drawings are needed to present to possible donors.
3. Muller Field Station needs to be moved into the "language of giving", appearing frequently in FLCC publications, news stories, slick regional magazines, and other publicity venues.
4. Perhaps a "Grant Acquisition Strategy Team" could be established that puts MFS in priority for grant opportunities both within FLCC and outside.

C. Endowment

If planned giving or other opportunities emerge to create an endowment for MFS, some funding goals should be developed proactively. Appropriate endowment targets for sustaining Muller Field Station might roughly be figured as follows:

- Director - Plan for the future a cost of \$100K per year in salary and benefits. An endowment of \$2 million would fund this position in perpetuity.
- Operations – Ultimately, perhaps 85% of operations could come from endowment support, with the other 15% coming from fees charged to various users and programs. For this level of support at the projected cost of field station operations, an endowment principal range would be \$5 million, figuring a 5% annual draw against the investment body.
- Research – Examples of endowment funded research activities include covering the expense of a distinguished visiting scientist each year, perhaps named after a generous donor; providing seed money for graduate student dissertation studies at MFS; or providing grants against fees to assist with expenses for FLCC or visiting scientists. An endowment of even as little as \$50,000 would provide significant contributions to research use of the field station.
- Monitoring – To fund 100% of a fully developed baseline monitoring program for the local environment, an endowment principal of \$2 million would be ideal. Smaller amounts can fund targeted monitoring tasks. Several field stations (notably St. Croix Watershed Research Station of the Science Museum of Minnesota) have had success finding donors interested in this type of program.

Appendices:

A. Strategic Planning Chart

B. Operating Costs

C. Proposed Organizational Chart

D. Reports from Previous Workshops (provided by FLCC)

Appendix A. Five-Year Planning Chart

Program	Goal		2008	2009	2010	2011
Administration	1. Director appointed at .5 FTE.	✓				
	2. Administrative Manager hired at .5 FTE.	✓				
	3. FLCC retreat held.	✓				
	4. Facility Manager hired at .5FTE.	✓				
	5. Planning completed and plans adopted.	✓				Review
	6. Organizational structure implemented.	✓				Review
	7. Policies in place for admission, code of conduct, fees, etc.	✓				Review
	8. Advisory committees established.		✓			
	9. Data Manager hired at .5 FTE.		✓			
	10. Environmental monitoring program developed and implemented.		✓			
	11. MFS website functional as interactive resource.		✓			
	12. Administrative Assistant increased to 1.0 FTE.				✓	
Research	1. Animal Care procedures in place.	✓				Review
	2. Informal connections developed within FLCC and with outside partners.	✓				
	3. Research Committee in place; research policies approved.		✓			
	4. At least 10 research projects use MFS, from at least three different departments.		✓			
	5. At least 15 research projects use MFS, with at least 3 coming from outside FLCC.			✓		
	6. At least 20 research projects use MFS, with at least 5 from outside FLCC.				✓	
Education	1. At least 10 FLCC classes use MFS, 3 from outside FLCC.	✓				
	2. MFS Director applies for at least two NSF programs for research training for undergraduate students.		✓			
	3. At least 15 classes use MFS; at least 3 from outside MFS.			✓		
	4. Plans for a small nature center are developed for a capital campaign.			✓		
	5. At least 20 classes use MFS; at least 5 from outside FLCC.					✓
Facilities	1. MFS site cleaned up, trails improved.	✓				
	2. Fish Lab completed.	✓				
	3. Facility use and maintenance policies in place.	✓				
	4. Facility plan completed and approved.		✓			
	5. Preliminary architectural plans available for fundraising for capital campaign.			✓		
	6. NSF FSML grant submitted and approved.			✓		
	7. FSML facilities completed.					✓
Funding	1. Planning grant expended.	✓				
	2. Business plan adopted and fee structure and policies set.		✓			
	3. Case statement and development materials completed for capital campaign.			✓		
	4. Finance Manager hired at 0.5 FTE.			✓		
	5. Capital campaign completed.					✓

Appendix B. Operating Costs

[Note: Costs in 000s are estimates, meant to be refined with greater accuracy.]

Task	Year One	Year Two	Year Three	Year Four	Year Five
Personnel	Director (0.5 FTE) Administrative Manager (0.5 FTE) Facilities Manager (0.5 FTE)	Director (0.5 FTE) Administrative Manager (0.5 FTE) Facilities Manager (0.5 FTE) Data Manager (0.25 FTE)	Director (0.5 FTE) Administrative Manager (0.5 FTE) Facilities Manager (0.5 FTE) Data Manager (0.5 FTE)	Director (0.5 FTE) Administrative Manager (1.0 FTE) Facilities Manager (0.5 FTE) Data Manager (0.5 FTE)	Director (0.5 FTE) Administrative Manager (1.0 FTE) Facilities Manager (0.5 FTE) Data Manager (0.5 FTE) Financial Manager (0.5 FTE)
Permanent Personnel Expense	80	90	100	120	150
Operations Expense	40	45	50	55	60
Total Annual Operating Expense	120	135	150	175	210
<i>Projected Annual Income (fees, donations, grants, etc.)</i>	<i>40</i>	<i>50</i>	<i>60</i>	<i>70</i>	<i>80</i>
Net Annual Operating Expense	80	85	90	105	130
Cumulative Net Operating Expense	30	115	205	310	440

* Includes all non-personnel expenses (travel, utilities, legal, office, etc.) except for capital construction

Appendix C. Proposed Organizational Chart

