

UNIVERSITY OF NORTH CAROLINA AT WILMINGTON
Center for Marine Science

STRATEGIC PLAN
2002 Update

September 4, 2002



THE UNIVERSITY OF NORTH CAROLINA AT WILMINGTON

September 4, 2002

From: Director, Center for Marine Science
To: All Faculty, Staff, Students and Tennant Program Associates
Subject: CMS Strategic Plan

[Text]

Sincerely,

A handwritten signature in black ink, appearing to read 'D. Baden', with a long horizontal flourish extending to the right.

Daniel G. Baden

Center for Marine Science
Office of the Director

UNCW Center for Marine Science 2002 Strategic Plan

Table of Contents

SECTION I: Strategic Planning at the Center for Marine Science.....	1
1. Introduction.....	1
2. Board of Governors Strategic Directions from Long-Range Planning 2000-2005	1
A. Access	1
B. Intellectual Capital Formation	2
C. K-16 Education	3
D. Creation and Transfer of Knowledge.....	3
E. Internationalization	4
F. Transformation and Change.....	4
3. UNCW 2000 Mission Statement	5
4. University-Wide Planning Goals	5
5. Academic Affairs Strategic Planning Process 2002-2007.....	6
A. Introductory Context.....	6
B. Core Issues	7
C. Focused Questions	7
6. The Center for Marine Science Strategic Planning Process	8
SECTION II: An Overview of the Center for Marine Science	10
1. Introduction.....	10
A. Vision.....	10
B. Mission.....	10
2. Administration:	10
A. Director	10
B. Associate Directors	10
C. Internal Advisory Committee	11
D. External Advisory Committee	11
3. Research 11	
A. Research Staff	11
B. Research Areas.....	12
C. Research Area Facilitation	12
4. Core Facilities.....	13
A. Nutrient Lab	13

UNCW Center for Marine Science 2002 Strategic Plan

B.	NMR Lab	13
C.	Sedimentology Lab	14
D.	DNA Sequencer lab	14
E.	Microalgal Taxonomy and Culture Lab.....	14
5.	Special Activities	15
A.	Pilot Projects	15
B.	Visiting Scientists Program.....	15
C.	Summer Interns.....	15
D.	Post-doctoral Research Associates Program.....	15
6.	Support Services.....	16
A.	Administrative Services	16
(1)	Financial Services	16
(2)	Human Resources	16
(3)	Support Services	16
B.	Marine Operations Services.....	16
(1)	Small Research Vessels	16
(2)	R/V CAPE FEAR	17
(3)	R/V SEAHAWK.....	17
(4)	Diving and Boating Safety.....	17
C.	Fixed Operations Services	18
(1)	Seawater System	18
(2)	Instrument Maker Shop Services	18
(3)	Information Technology and Graphics Services.....	19
(4)	Oceanographic Equipment Support Services.....	19
7.	Affiliated Activities (TBD)	19
A.	National Undersea Research Center	19
B.	UNCW Division of Public Service/Marine Quest.....	19
C.	NC Sea Grant Extension Program	20
D.	NC Coastal Reserve/National Estuarine Research Reserve.....	20
E.	UNCW Advancement/Marine Science Program Development.....	21
F.	Lower Cape Fear River Program	21
SECTION III: Strategic Plan: Global Goals, Goals, Objectives and Strategies.....		22
GLOBAL GOAL: RESEARCH		22
Goal R.1.	Support and expand opportunities for marine science research.....	22
Goal R.2.	Enhance involvement of university students in a variety of research activities.....	23
Goal R.3.	Establish a Marine Science Post-doctoral training program & develop guiding policies.	24
Goal R.4.	Aid the dissemination of information about ongoing research to faculty, community members and managers.....	24

UNCW Center for Marine Science 2002 Strategic Plan

Goal R.5.	Promote information exchange and collaborations in marine science among constituent institutions of the UNC System.....	25
GLOBAL GOAL: EDUCATION.....		26
Goal E.1.	Develop the Master of Science in Marine Science Program to its full potential.	26
Goal E.2.	Increase the presence and involvement of undergraduate students at CMS.	27
Goal E.3.	Expand the Post-doctoral Fellow program.....	28
Goal E.4.	Improve instructional technology, including laboratory instrumentation, at CMS.....	28
Goal E.5.	Increase opportunities for marine science students to participate in cruises and other types of fieldwork.....	29
Goal E.6.	Enhance faculty participation and productivity in marine science.	29
Goal E.7.	Increase interaction among marine science faculty, especially between those at CMS and on the main campus.	30
GLOBAL GOAL: ADMINISTRATION.....		31
Goal A.1.	Improve infrastructure management:	31
Goal A.2.	Improve faculty governance:	31
Goal A.3.	Improve communications among marine science faculty.	32
Goal A.4.	Support multiple approaches to marine research.....	32
Goal A.5.	Compensate resident faculty for additional time required to transit to main campus for classes.	32
GLOBAL GOAL: COMMUNITY EDUCATION SERVICES (CES).....		33
Goal CES.1.	Transfer the Marine Quest Program to the Center for Marine Science	33
Goal CES.2.	Become self-sufficient with full functional, administrative and fiduciary responsibility within CMS policies.	34
Goal CES.3.	Integrate Marine Quest’s Strategic Planning Process with CMS.	34
Goal CES.4.	Develop a Program Evaluation process.	35
Goal CES.5.	Identify opportunities for “Cross-Fertilization.”	36
GLOBAL GOAL: ADVANCEMENT AND DEVELOPMENT		37
GLOBAL GOAL: TECHNOLOGY TRANSFER.....		38
APPENDIX A: “SCHOLARSHIP RECONSIDERED: PRIORITIES OF THE PROFESSORIATE” by Ernest L. Boyer		39
I.	The Scholarship Of Discovery	39
II.	The Scholarship Of Integration	39
III.	The Scholarship Of Application	40
IV.	The Scholarship Of Teaching	40

UNCW Center for Marine Science 2002 Strategic Plan

SECTION I: Strategic Planning at the Center for Marine Science

1. Introduction

The Center for Marine Science has embarked on a long-term strategic planning process aimed at ensuring excellence in Marine Science...

- Research
- Education
- Administration
- Community Education Services
- Technology Transfer
- Advancement and Development

These are our Global Goals. While many goals have been achieved, the Center for Marine Science is not at a stopping point. Rather, our successes have won us a vantage point to identify directions for further improvement. Our intention is to continue to build on the strong base developed in the last decade and to become a world-class marine science center in every sense.

We will define our strategic vision and identify goals and objectives to accomplish that vision through broad-based participation in various planning committees, crosscutting teams, and existing committee structures. The Administration will synthesize these inputs into a comprehensive strategic plan that will guide our ongoing efforts at the Center and support development and execution of new initiatives.

The Center for Marine Science Strategic Plan is developed and implemented in concert with guidance from several external sources, including the Board of Governors Strategic Directions, the University of North Carolina at Wilmington Mission Statement, University-wide planning goals, and strategic planning process guidance from the Vice Chancellor for Academic affairs. Excerpts from these references are provided in the following paragraphs.

2. Board of Governors Strategic Directions from Long-Range Planning 2000-2005

A. Access

Ensure access to higher education for all qualified citizens and embrace a vision of lifelong learning.

- Assist North Carolina in reaching its goal of closing the gap between the state and national average with respect to the percent of residents who have earned a bachelor's degree or higher, with no significant differences between the educational attainment of majority and minority populations.
- Continue to promote access on the part of traditionally underrepresented segments of North Carolina's population, particularly racial minorities.

UNCW Center for Marine Science

2002 Strategic Plan

- Continue to keep costs of attendance at UNC institutions affordable and to address the adequacy and effectiveness of need-based aid for undergraduates.
- Implement and monitor annually the 10-year enrollment plan adopted by the Board of Governors in response to the anticipated surge in enrollments, with special attention to efforts to increase enrollments at smaller institutions with under-utilized capacity.
- Maximize the capacity of UNC institutions to serve the anticipated enrollment growth as well as the need for lifelong learning through more efficient use of on-campus facilities, increased summer school enrollment, expanded use of off-campus instruction sites, and distance education.
- Continue to pursue state support for new and renovated facilities to accommodate current students and anticipated enrollment growth.
- Facilitate educational access through the effective use of information technology to provide information on educational opportunities (e.g., Pathways/CFNC) and distance education courses and programs, to deliver academic and student services, and to promote interinstitutional collaboration in course and program delivery.

B. Intellectual Capital Formation

Through excellent graduate, professional, and undergraduate programs, develop an educated citizenry that will enable North Carolina to flourish.

- Develop strategies to assess and respond in a timely manner to the state's educational needs, including the need for lifelong learning for both career development and personal enrichment.
- Ensure the quality of academic programs both on-campus and off-campus through regular review and assessment of degree programs and instruction and through assessment of the quality of and student access to academic resources and services (e.g., academic advising, libraries, laboratories, IT), and student support services (e.g., admissions, financial aid, registrar, retention, counseling, etc.) that promote student development, retention, and graduation.
- Attract and retain exceptional teacher/scholars through competitive compensation and benefits, endowed chairs, start-up funds to initiate research programs and other appropriate support for instructional and research activities, and recognition and reward of outstanding faculty performance.
- Strengthen undergraduates' knowledge and academic skill development (including IT skills, critical thinking, and working in teams and in diverse environments) and prepare them to be successful in postgraduate studies and/or in the workplace; and prepare informed and successful graduate and professional students.
- Promote broad-based diversity in enrollments, international education opportunities, and a global perspective throughout the University community in order to prepare citizens capable of functioning effectively in a multiethnic and increasingly global society.

UNCW Center for Marine Science

2002 Strategic Plan

- Ensure that the facilities and campus environment necessary to support educational excellence are available through the implementation of the Board of Governors' capital plan.

C. K-16 Education

Continue to propose and support initiatives to serve the needs of the State's public schools.

- Continue efforts to develop outstanding teacher preparation programs that include strong discipline content, pedagogy, clinical training, i.e., integration of Arts and Sciences, accreditation of programs and assessments to ensure high quality teachers, administrators, and other school personnel.
- Expand efforts in teacher preparation to increase the supply of well qualified teachers to serve the rapidly growing needs of North Carolina's schools—using traditional approaches, incentives to students, and innovative strategies, such as the 15 University-School Teacher Education Partnerships, NC TEACH, the NC Model teacher Education Consortium, the UNC Teacher Education E-Learning Initiative, and the 2+2 agreement with NC community colleges.
- Expand our commitment to the development of comprehensive, high quality programs of continuing professional development of K-12 school personnel from their initial induction to retirement.
- Strengthen partnerships with K-12 and community colleges in the development of programs, curriculum and instructional materials—including materials that advance the use of information technology—to ensure continuous improvement in the academic achievement of North Carolina's students and to promote student success in higher education.
- Support and strengthen both research and public service programs in the 15 colleges/schools/departments of education in the Center for School Leadership Development: Executive Leadership Academy, Principals' Executive Program, Principal Fellows Program, NC Center for the Advancement of Teaching, NC Mathematics and Science Education Network, NC Teacher Academy, and in the NC Education Research Council and the Southeast Center for Teaching Quality.
- Continue to promote collaboration with community colleges through initiatives such as the North Carolina Comprehensive Transfer Articulation Agreement, delivery of baccalaureate completion and graduate programs at community college sites, and enrollment planning.

D. Creation and Transfer of Knowledge

Expand the frontiers of knowledge through scholarship and research and stimulate economic development in North Carolina through basic and applied research, technology transfer, and public service activities.

- Promote basic and applied research for the discovery and dissemination of new knowledge as a fundamental mission of the University.

UNCW Center for Marine Science

2002 Strategic Plan

- Sustain UNC research, public service, and knowledge transfer activities that enrich the quality of life in North Carolina citizens through economic development, community outreach programs, and improved health, educational, and cultural resources.
- Continue to expand the external sponsorship of UNC research and other creative activities.
- Facilitate collaborative research and partnerships with industry, government, and other entities to advance strategic priorities of great importance to North Carolina's economy and quality of life (e.g., biosciences and biotechnology marine and environmental sciences, engineering and materials sciences, information technology and telecommunications).
- Encourage technology transfer and the commercialization of UNC research discoveries.
- Cooperate with industry and government sectors in adapting information technology for application to R&D, specifically to improve scientific collaborations and knowledge management practices as means to enhance economic development.

E. Internationalization

Promote an international perspective throughout the University community to prepare citizens capable of functioning effectively in a multi-ethnic and global society.

F. Transformation and Change

Use the power of information technology and more effective educational, administrative, and business practices to enable the University to respond to the competitive global environment of the 21st century.

- Implement the recommendations of the Information Technology Strategy (ITS) project, emphasizing initiatives in the following five areas:
 - Campus Teaching and Learning with Technology (TLT): Enhance campus TLT activities through campus TLT centers, instructional technology services, faculty development labs, and instructional technology development grants; and create a Collaborative TLT Program with a TLT collaborative organization, faculty fellowships, a web portal for UNC faculty, a collaborative grant program, and faculty workshops/symposia.
 - Distance Education: Coordinate a comprehensive distance education strategy and deploy distance education pilots to evaluate distance education models and strategic challenges as a prelude to pursuing broader collaborative approaches.
 - Administrative Systems: Establish the Alliance Shared Software Support Center to provide collaborative software services to participating campuses; and create a UNC-wide data warehouse to simplify UNC-wide data collection, improve data retention, and provide more efficient and effective reporting capabilities.

UNCW Center for Marine Science

2002 Strategic Plan

- Services for Students: Implement Web-enabled services for students through approaches suitable for the campus context, and develop integrated services-for-students programs through approaches suitable for the campus context.
- Logistical Needs: Expand campus network maintenance, enhance user support and training, and create a collaborative procurement program to facilitate multi-campus purchases of information technology hardware, software, and services.
- Streamline administrative processes and increase managerial flexibility in conducting the affairs of the University and its constituent institutions.
- Improve the ability of the General Administration to collect, process, and analyze university-wide data for accountability and assessment.

3. UNCW 2000 Mission Statement

“The University of North Carolina at Wilmington is a public comprehensive university dedicated to excellence in teaching, scholarship and artistic achievement, and service. Through the College of Arts and Sciences, the professional schools, and the graduate school, the university seeks to stimulate intellectual curiosity, imagination, rational thinking, and thoughtful expression in a broad range of disciplines and professional fields. Of prime importance is the university's commitment to undergraduate teaching. The humanities, the arts, the natural and mathematical sciences, and the behavioral and social sciences comprise the core of the undergraduate curriculum. Strong graduate programs complement the undergraduate curriculum. The university considers scholarly practice, research, and creative activities essential for effective learning.

UNCW encourages public access to its educational programs and is committed to diversity, international perspectives, community and regional service, and the integration of technology throughout the university. It strives to create a safe and secure environment in which students, faculty, and staff can develop interests, skills, and talents to the fullest extent. UNCW seeks to make optimum use of available resources and to celebrate, study, and protect the rich heritage, the quality of life, and the environment of the coastal region in which it is located.”

(Adopted by the UNCW Board of Trustees on July 22, 2000)

4. University-Wide Planning Goals

In its pursuit of excellence, the university commits itself to the following goals:

1. Enhance the quality of the learning experience at all levels specifically emphasizing the university's historical commitment to the preparation of the undergraduate student.
2. Strengthen and develop the role of graduate education.
3. Sustain and strengthen teaching, learning, research, creative work and other forms of scholarship throughout the university.

UNCW Center for Marine Science 2002 Strategic Plan

4. Expand and strengthen the internationally recognized marine programs and broaden opportunities for marine related study, research, and public service throughout the university community.
5. Broaden the university community's study of and involvement in international activities.
6. Expand campus awareness, involvement, and study of environmental issues specifically addressing those concerns unique to the world's coastal regions.
7. Broaden the university's leadership position as a regional service provider by initiating and coordinating programs that address the special needs of southeastern North Carolina.
8. Broaden the commitment to nurture, sustain, and expose the university community to a diversity of thought, culture, and ethnic background.

(Goals adopted by the University Planning and Quality Council on December 11, 1991.)

5. Academic Affairs Strategic Planning Process 2002-2007

On October 30, 2001, Dr. John C. Cavanaugh, Provost and Vice Chancellor for Academic Affairs, sent an e-mail relating to the strategic planning process. Dr. Cavanaugh wrote: "As described in the document about the process [beginning with paragraph A. below], we are required to file a 5-year strategic plan with the Office of the President by May. As mandated by them, we must address the Board of Governors six strategic directions in our plan [see paragraph 2.A through 2.F, above]. Additionally, in order to maximize our ability to build on the SACS self-study, we are not asking you to rewrite that document. The SACS self-study thoroughly describes where we have been. The Deans' Council and I now want to focus attention on where we are going. Specifically, we want to focus on how we will improve the quality of our programs over the next 5 years."

A. Introductory Context

As you know, we are required to have formal strategic planning documents by both SACS and the Office of the President. Traditionally, the planning period has been five years. Our plan was due last spring, but because we were completing the SACS self-study, it was delayed until this year. By waiting, we are now able to apply what we learned from the SACS process, and we do not have to start from scratch to complete our strategic plan.

The five-year period 2002-2007 will be critical for Academic Affairs. After over a decade of constant growth of programs, students, faculty, and staff, the time has come to consolidate our gains. Consequently, the Academic Affairs strategic plan for 2002-2007 will focus on how we will continue to improve quality, how we will measure it, and how we will determine how we compare with other comprehensive universities. These issues are critical to setting appropriate budget priorities as we begin to address the acute needs we have for operating budgets, equipment, and faculty.

UNCW Center for Marine Science

2002 Strategic Plan

In completing each unit's portion of the strategic plan, the focus will be on the three core issues and focused questions listed below. You must also address each of the Board of Governor's strategic directions (listed in a separate document). A goal in this process is for units to provide *concise* documents. We fully recognize that not every unit will have an equal amount of comment to each question or each BOG strategic direction. Should any unit propose a new degree program as part of the plan, it must directly address the focal issues and require few, if any, new resources.

The deadline for submitting the draft reports from each unit to your respective dean (and, if you have a graduate program, to Neil Hadley) is February 15, 2002. The Deans' Council (augmented with faculty representatives) will then review the drafts for consistency and to identify common themes. If necessary, drafts will be returned to units by March 31 for revision by May 10.

This planning process is aimed at two primary goals: (1) to provide a set of strategic guidelines focused on quality and not simply on the need for more resources; and (2) to address identified shortcomings in our lack of strong correspondence between assessment and benchmarking, and budgeting and improvements in academic programming.

B. Core Issues

1. How do you define quality in your program? How will you significantly increase the quality of your academic programs and academic support services?
2. How will you assess this improvement? How will you know that your quality has increased?
3. How will you benchmark the quality of your programs and academic support services?

C. Focused Questions

1. Why does this department exist in its current form? What are your potential alliance departments/programs at UNCW?
2. What is the main purpose of each of your programs (e.g., service, major, etc.)? What are their main values? What is meant by each value?
3. What other institutions (either in North Carolina or elsewhere) have similar programs? How do yours compare with these others? What is your program doing that distinguishes it from the others?
4. What is the primary focus of teaching in the program? Content? Skills? What are the core competencies in the program? Why are we teaching these (and not others)? How well do students understand this? How do you know that what you are teaching is beneficial to students? How do you know that what you are teaching prepares students to deal with change?

UNCW Center for Marine Science

2002 Strategic Plan

5. What opportunities for quality improvement can you identify? How do you identify these opportunities?
6. What relationships do you foster and model (student-faculty, student-staff)? How do you do this? How does the department strive to recruit and mentor students into the major?
7. How does the program mentor faculty to improve their teaching skills and their research/scholarship/creative activity to foster continued learning? How is this learning transmitted to students? How is this incorporated into faculty member's goal setting each year?
8. How do you prepare students for lifelong learning?
9. How does your department/program address various types of scholarship (e.g., Boyer's scholarship of discovery, scholarship of teaching, scholarship of application, scholarship of integration)?
10. How do your programs address the various elements in the university mission statement and your college/school mission statement?
11. How do you intend to increase faculty skills in and use of technology in teaching?
12. What courses and complete programs do you envision being online by 2007?
13. What is the ideal student-faculty ratio in your major(s)? How did you arrive at that number?
14. What other issues are important to your department/program in terms of quality?

6. The Center for Marine Science Strategic Planning Process

The Center for Marine Science can be seen as a semi-mature institution: mature enough to have made hard choices and dramatic progress, yet young enough to show surprising potential for growth. A hard look at what we have accomplished and our aspirations for the future suggest four areas where we must plan to improve:

1. Organizational Integration: A "Virtual Organization"
2. Information Technology Integration (software; knowledge sharing, data management)
3. Performance Measurement and Accountability
4. Organizational Support Services

We will strive to improve these "infrastructure services" as the foundation for accomplishing the strategic goals and objectives of the Center's global goals.

Open and inclusive communication with key constituents and stakeholders is a priority. In order to be successful in building a common vision and in meeting long-range goals, we are seeking

UNCW Center for Marine Science

2002 Strategic Plan

and fostering broad-based communication within CMS. This can be an unsettling process as we initially question our own core beliefs and our individual expectations - for our Center and for each other. We need to trust each other in this process and work together in a spirit of inclusiveness that encourages participation and innovation. As we develop our shared vision for the future of our Center, we must identify and build on our combined strengths. While this process necessarily entails some personal introspection, our goal is to be inclusive, not exclusive. We trust that through our collaborative approach, we will develop a direction that will be good for the Center and with which we can each align our efforts.

Strategic Planning is a process, not an event. As such, that process is itself an important vehicle for communication among the many partner organizations and academic disciplines that make up CMS. Our Strategic Plan will be a living document that guides both our long-term and our daily activities. It will take the Vision (future state, or “there”) and the Mission (“here”) and fill in the gaps with goals, objectives and strategies (to get us from “here” to “there.”) While the plan will look forward five years, we will continually review our progress, make mid-course corrections when necessary, and update the plan at least once a year. The following is a brief overview of our process for reviewing, implementing, and finally, integrating our strategic plan into our daily activities.

Ad-hoc committees organized by Global Goal initiate updates to the Strategic Plan. After all of the committee reports are complete, we will integrate them into the first draft of the Center for Marine Science Strategic Plan Update. Members of the original committees will be asked to form crosscutting teams to look at the strategic goals and objectives of each of the global goals from the perspective of “client” groups: Public Education (K-12 and adult continuing education), undergraduates, graduates, post-doctoral associates and visiting scientists. Through this process, we will identify which strategic goals and objectives apply to these client groups and identify any additional goals and objectives to better serve those groups. The goals and objectives will then be prioritized in the client groupings.

The output of the crosscutting teams will include a prioritized listing of the first draft strategic plan applicable to the client group, and any new goals and objectives identified for that group, sorted by global goal.

The Internal Advisory Committee will review the recommendations of the crosscutting teams, recommend any modifications, and assign individual objectives to existing CMS standing committees that will be responsible for executing and monitoring achievement of the objectives. The finalized strategic plan, with responsible committees designated will be presented to the faculty, staff and associates of CMS for review, recommended modifications and formal acknowledgement.

The CMS Strategic Plan Goals and Objectives will then be sorted and distributed to the responsible standing committees, which will set priorities and establish a plan to accomplish these goals and objectives. Each of the committees will be asked to give brief updates on our progress towards these goals and objectives at our monthly Faculty and Staff meetings.

UNCW Center for Marine Science 2002 Strategic Plan

SECTION II: An Overview of the Center for Marine Science

1. Introduction

A. Vision

The UNCW Center for Marine Science is a world-class student-centered research facility specializing in interdisciplinary approaches to research, education and public service in coastal and estuarine oceanography.

B. Mission

The UNCW Center for Marine Science provides a collegial, interdisciplinary environment for students and researchers to collaborate in basic and applied marine research, education and public service in the fields of oceanography, coastal and estuarine studies, marine biology, marine chemistry, marine geology, marine biotechnology and aquaculture. This is accomplished in part by:

- Supporting publication of research findings and to aiding information dissemination to the public.
- Providing administrative, operational and technical support and other services that create an environment conducive to research and education.
- Supporting the University's instructional programs by providing opportunities for undergraduate and graduate training in marine-related research.
- Initiating research efforts in the application of basic knowledge as a response to local, state, national, and international needs and to provide information to local, state, and federal agencies that can contribute to marine science policy decisions.

2. Administration:

A. Director

The Director of the Center for Marine Science shall be responsible for all administrative functions of the Center, promote marine science research activities, solicit funding, and provide advice as requested by the Provost and the Chancellor.

B. Associate Directors

There are three Associate Directors. The Associate Director for Research serves as the Chief Operating Officer and coordinates matters pertaining to Resident and Non-resident Faculty, Visiting Scientists, Research Core Facilities, and Research Programs. The Associate Director for Education coordinates matters pertaining to the Marine Science Masters Degree Program, undergraduate programs and undergraduate summer programs, and provides liaison among the marine science disciplines. The Associate Director for Academic Planning coordinates the post-Doctoral training program, assists with arrangements for the National Ocean Science Bowl that

UNCW Center for Marine Science

2002 Strategic Plan

will be held at UNCW-CMS in 2003 and 2004, works to integrate undergraduate students into marine science research, and works with the Associate Director for Education to regularize the M.S. programs in the various marine sciences.

C. Internal Advisory Committee

The Internal Advisory Committee serves as an advisory body to the Director. The IAC operates as a body whose principal function is to advise on procedural and programmatic issues within the hierarchical structure of the Center, UNCW, and the UNC system as a whole.

The IAC is chaired by the CMS Director and composed of the Associate Directors (Research, Education and Academic Planning), the Chairs of Biology, Chemistry, Earth Sciences, and Physics and Physical Oceanography; the Environmental Studies Program Director; two resident and two non-resident faculty. The faculty members are chosen for two-year terms by vote of the marine science faculty.

The composition of the IAC may change from time to time, based on need and program relevance. IAC meetings are held at least quarterly and the presence of 8 members of the IAC constitutes a quorum. The Director and three Associate Directors constitute the Executive committee of the Center. The Executive Committee draws up agendas for IAC meetings, deals with sensitive issues not appropriate for the entire IAC, and together as a group or individually are the official advocates of CMS to the UNCW administration.

D. External Advisory Committee

An external advisory board is established that employs the talents of prominent marine and environmental scientists, serving for 3-year terms. The EAC will meet annually to review CMS programs, and will provide a report summary to the Director for review and implementation as appropriate to further the programs at the Center. The EAC will number between 5 and 7, with 4 members being an absolute minimum to conduct an annual review. The committee will elect its own Chair, who will serve for the entire 3-year period.

The purpose of the EAC is to provide guidance on CMS's alliance with National and International trends in marine sciences, to recommend enhancement or reduction on the support for particular programs, and to offer guidance in new research avenues where the Center might provide unique input. Prior to its annual meeting, the Center will provide a written summary of the previous year's activities and during the visit, Center Investigators will provide short written and oral presentations of their work for critique. Potential members for the first EAC of the Center have been solicited nationwide. All solicited have agreed to serve.

3. Research

A. Research Staff

The research staff consists of the Director, Associate Directors (Research and Education), resident and non-resident Marine Science Faculty, Research Associates who hold non-faculty research appointments, and Post-doctoral Research Associates. Resident faculty are those with principal offices and laboratories at the Center for Marine Science. Non-resident faculty are

UNCW Center for Marine Science

2002 Strategic Plan

those who engage in marine science research and may collaborate with resident faculty or use CMS facilities.

Faculty members conducting marine science research in the Departments of Biological Sciences, Chemistry, Earth Sciences and Physics and Physical Oceanography participate in this program. Center faculty serves on regional, national and international research and policy advisory groups and thereby contribute to the development of marine research agendas in the U.S. and around the world. International interactions with laboratories in Europe, North America, South America, Australia, New Zealand, Asia, Africa, Bermuda, the Bahamas and Caribbean, and all regions of the coastal United States augment extensive programs addressing North Carolina coastal issues. By integrating these advisory functions with research programs of the highest quality, CMS enhances the educational experience provided by the University of North Carolina at Wilmington for both undergraduate and graduate students in marine science.

B. Research Areas

The purpose of Research Areas at CMS is to:

- Assist with the center's mission to foster multidisciplinary discussions, to identify potential research collaborations, and to support graduate education.
- Provide an organizational framework for research activities at the center for the purposes of information dissemination and public outreach.

There are currently three principal Research Areas:

- Coastal, Estuarine, and Oceanographic Studies
- Molecular Ecology, Physiology, Biochemistry, Chemistry, Morphology and Systematics
- Applied Marine Sciences (for example biotechnology, aquaculture, fisheries biology, marine mammals research and coastal restoration research).

C. Research Area Facilitation

The facilitation of research areas and identification of research focus groups is the responsibility of the Marine Science faculty. The intent is to allow faculty to identify scientific areas with broad faculty interest that may stimulate intellectual involvement as well as possibly resulting in new collaborations.

To meet this intent and to maintain maximum flexibility, facilitators in the three Research Areas at CMS will focus on different faculty-initiated research topics each year. A faculty member interested in facilitating a Research Area will submit a one page planning letter describing the focus topic, how this focus area may enhance faculty activities at CMS (e.g. explore an area with increasing funding opportunities), and which faculty are interested in participating. These focus topics will last for one semester during an academic year.

A facilitator will be expected to lead a faculty discussion/seminar group on the focus topic, a one semester graduate student journal club and will be responsible for identifying and inviting two outside seminar speakers as part of the CMS seminar series (the speakers will normally relate to

UNCW Center for Marine Science

2002 Strategic Plan

the focus topic). The facilitators will also assist the Director as needed with outreach and informational needs related to the Research areas (e.g. providing summaries of faculty research when needed, updating general web site or other CMS information materials, presentations to university or community groups on occasion, etc.). A facilitator will receive 1 month of summer salary in compensation for these activities. Aside from their intellectual merit, an outcome of these focus discussions may be the submission of pilot projects to obtain preliminary data on related research projects or the submission of proposals to appropriate funding sources.

Up to four faculty facilitators will be selected each year with at least one but no more than two from each of the Research Areas to help ensure the greatest variety of focus topics. The Research Staff will vote on the appropriateness of proposed topics and which topics should be pursued if more than one is proposed in a specific program.

4. Core Facilities

The Center maintains several shared-use research support facilities and equipment available for researchers associated with the Center.

A. Nutrient Lab

The state of the art equipped nutrients laboratory of the Center for Marine Sciences conducts studies on quality and bioproductivity of waters from different aquatic environments (riverine, estuarine and marine). Major goals of the laboratory are to conduct nutrient analyses: develop basic analytical skills of chemical oceanography students in the marine science programs at the UNCW; and provide requested expertise in chemical oceanography to Principal Investigators from UNCW. The facilities of the laboratory include:

- Segmented Continuous Flow Auto Analyzer III Bran+Luebbe® for analysis of nitrate, nitrite, ammonium, phosphate, silicate, total dissolved nitrogen and total dissolved phosphorus;
- Shimadzu TOC-5050A analyzer for dissolved organic carbon analysis, combined with a Total Dissolved Nitrogen Analyzer Antek (Model 9000 Series) for total dissolved nitrogen determination;
- CHN Analyzer (model NC 2100 Sediments) for particulate organic carbon and particulate organic nitrogen measurements;
- Shimadzu UV-Visible Spectrophotometer (Model UV-1601) for multipurpose environmental studies;
- Turner Designs Fluorometer (Model 10 AU) for phytopigments analysis and other environmental studies

B. NMR Lab

The NMR Core Facility contains a state-of-the-art Bruker 500MHz Nuclear Magnetic Resonance (NMR) spectrometer. This instrument is an essential component in a suite of chemical analytical techniques that are required to solve the structure of new complex molecules isolated from the marine organisms. Thus this facility provides researchers with the key structural information

UNCW Center for Marine Science

2002 Strategic Plan

that is necessary to determine the molecular structure of marine natural products that could be potential toxins, or perhaps new drug leads or nutraceuticals for the pharmaceutical industry. In addition, the NMR spectrometer is equipped with a Solids Probe, which permits researchers to examine the NMR spectra of samples in the powdered or solid form. This capability is critical when examining the chemistry of large biopolymers for example. Local networking permits the researcher to process any of the NMR data off-site without having to travel to the NMR facility.

C. Sedimentology Lab

The sedimentology laboratory contains facilities to conduct grain size analyses. A Beckman Coulter LS 200 is available for size analysis of particles ranging in size from 0.4 mm to 2 mm in diameter. Stainless and brass sieves and sieve shakers are also housed in the laboratory for analysis of coarser material. Drying ovens, balances, muffle furnaces, and limited glassware are also available.

D. DNA Sequencer lab

The DNA Analysis Core Facility features two Applied Biosystems (ABI) Automated DNA Analyzers—one ABI 377 slab-gel instrument, the workhorse of DNA sequencers, and one ABI 3100, the state-of-the-art capillary machine for medium-throughput DNA sequencing and DNA fragment analysis. Both instruments are served by IBM-PC and MacIntosh computers outfitted with *Genescan*TM and *Genotyper*TM for data collection and a multitude of software for analysis of DNA and amino acid sequences. Local networking and connections to state bioinformatics resources allows sophisticated analyses with applications in molecular biology, ecology and evolution, and genomics of marine organisms.

E. Microalgal Taxonomy and Culture Lab

The Microalgal Taxonomy and Culture Facility, consisting of isolation and identification laboratories, walk in growth chambers, smaller climate control experimental chambers and microscopy equipment is dedicated to the isolation, cultivation and identification of marine microalgae. Many of the species studied are harmful algae forming toxins and the initial phases of study include accurate identification and documentation using brightfield and electron microscopy. Isolation and cultivation of these species as clonal cultures is done to allow studies focusing on the physiology and ecology of these microalgae and to develop a living reference collection for use by collaborators dealing with toxin production, synthesis, genetics and detection in the natural environment. This laboratory component provides a rapid response to agencies and individuals sending environmentally sensitive samples threatening a loss of natural resources or potential threats to human health. In addition to these services, this laboratory component provides advanced training in species identification as well as producing literature used by university students, professionals from state agencies and administrators requiring knowledge of these microalgae.

UNCW Center for Marine Science

2002 Strategic Plan

5. Special Activities

A. Pilot Projects.

The Center for Marine Science provides funds (when available) on a competitive basis to support research projects representing new initiatives. Faculty members in the marine sciences may submit proposals for Pilot Project funding. Projects must be designed to initiate new research areas. Collaborative efforts of two or more faculty are encouraged. No more than two single investigator projects will normally be funded each year. Pilot Projects may provide funds to support one month of summer salary for UNCW principal investigators, graduate research assistantships up to one year, and research supplies, equipment and services. One month of summer salary for principal investigators will be limited to once every other year.

B. Visiting Scientists Program.

The Center for Marine Science has designated visiting scientists labs to provide space to visiting scholars in the field of marine science for collaborative projects with faculty and students.

The Center for Marine Science Facility at Myrtle Grove offers opportunities for visiting scientists to participate in the ongoing research activities of the Marine Science Program. The Visiting Scientist Committee is charged with the responsibility to develop policies and procedures to ensure that effective use of the facility by visiting scientists is achieved. The foundation of the program assumes that all visiting scientists will be identified and sponsored by a member of the marine science faculty.

Visiting Scientists will likely fall in two categories, although each visiting scientist will be unique and have differing needs. One category includes visiting scientists who do not require use of the visiting scientist laboratories but rather will utilize space provided by the sponsoring faculty member. These individuals may need services provided by the Center. The other category includes visiting scientists who will be assigned space in one of the two visiting scientist laboratories and may also need services provided by the Center

C. Summer Interns.

Summer internships can provide valuable research experiences for students; therefore the Center should explore funding possibilities for summer internships for undergraduate and graduate students. These internships will be awarded based on brief competitive proposals.

D. Post-doctoral Research Associates Program.

The Center for Marine Science funds several Post-doctoral Research Associates. These positions are non-tenure track research associates funded initially for 12 months but maybe renewed for a maximum of 36 months. Candidates are expected to hold a PhD degree or equivalent in the appropriate discipline. Opportunities for research exist in a wide range of areas within marine sciences. Salary will be commensurate with training and experience as determined by NIH postdoctoral salary guidelines.

UNCW Center for Marine Science

2002 Strategic Plan

6. Support Services

A. Administrative Services

A professional staff provides administrative support to the administration, faculty, researchers and staff affiliated with the Center for Marine Science. Services include:

(1) Financial Services

- Budget
- Procurement
- Grant Management

(2) Human Resources

- Payroll
- Position Management
- Personnel Management

(3) Support Services

- Travel Claims
- Visitor Control
- Shipping and Receiving

B. Marine Operations Services

The Center operates a fleet of small boats that are available to UNCW faculty for research and instruction. The boat operation program operates 16 vessels ranging in size from 15 to 25 feet for research in the rivers, sounds and estuaries as well as offshore. Vessels are available for faculty and graduate student research projects as well as for class field trips. Additionally, the Center operates a 65-foot Research Vessel, The R/V CAPE FEAR, which is used for ocean research and class instructions, and the 41-foot R/V SEAHAWK, which is used for coastal water observing, research and diving operations. The R/V CAPE FEAR and R/V SEAHAWK are receipt-supported vessels; however, 12 days a year are set aside for instructional programs on the R/V CAPE FEAR that are supported by the University, including use of selected oceanographic equipment.

(1) Small Research Vessels

The CMS small research vessel fleet includes seventeen motorboats and two canoes (with paddles). The motorboats range from 16 feet to 25 feet. CMS also owns a large rigid hull inflatable (RHIB) with a 25Hp outboard engine which is dedicated to the Research Vessel CAPE FEAR to support diving operations. All boats with the exception of the R/V CAPE FEAR and R/V SEAHAWK have their own trailers. All boats are equipped with USCG recommended safety gear, GPS, depth sounder, and VHF radio. We also carry cellular phones for added safety.

UNCW Center for Marine Science

2002 Strategic Plan

Generally, vessels over 20 feet length can operate offshore depending on the weather conditions, to a maximum distance of 35 nautical miles (each boat has individual operating parameters).

Typical projects carried out on these vessels include: physical, chemical and biological sampling; bottom coring; marine mammal, marine bird, fish and turtle surveys; current profiling with ADCP current meter; small trawls for benthic sampling; scientific diving to collect live samples; small moorings deployment; and bottom surveys with divers and depth-sounder/recorder.

Area of operations includes: freshwater/saltwater marshes, tidal creeks, coastal river systems, the Intracoastal Waterway, and the Atlantic Ocean

(2) R/V CAPE FEAR

The R/V Cape Fear is a fast, comfortable vessel available for research, training, and educational cruises in waters from near-shore to the continental slope. Based in Wilmington, North Carolina, the Cape Fear operates either as a day boat, or for extended operations up to five days at a time. Operations are conducted from the Chesapeake Bay to the Gulf of Mexico.

The R/V CAPE FEAR has berthing for eight scientists and two crew for extended trips; larger groups, such as classes, can be accommodated for day cruises within twenty nautical miles of land. The vessel is equipped with DGPS, Loran, 72 mile radar, SSB and VHF radios, a colorscope fathometer and a cellular phone. The R/V Cape Fear is constructed of fiberglass and features six independent watertight compartments. The aft work area deck is six hundred square feet with a canopy covering 75% of the area. A water level dive platform provides easy and safe access to the water. A steering station on the aft work deck allows the vessel captain to maneuver the vessel to accommodate science operations. Hydraulic connections, an A frame, a winch and an onboard nitrox mixing station provide additional capabilities for scientific research projects.

Typical missions conducted aboard the R/V CAPE FEAR include diving operations, side scan and seismic surveys, ROV operations and oceanographic instrument deployment and retrieval.

(3) R/V SEAHAWK

The R/V SEAHAWK is a fast, comfortable vessel available for research training, and educational cruises in coastal waters. The SEAHAWK operates as a day boat from Wilmington, North Carolina.

(4) Diving and Boating Safety

The Diving and Boating Safety Office is responsible approving all small boat operators and for training and approving all divers that conduct research or instructional activities through the Center for Marine Science. All boat operators must complete an approved boating safety course and pass a written test of knowledge on the North Carolina boating safety rules and regulations as well as the material contained in the UNCW Guide for Safe Boating Operations. Current certification in cardiopulmonary resuscitation and basic first aid is also required. Once all required paperwork is completed, all applicants are given a practical checkout on the specific vessel/trailer system they will be using for conducting their research activities.

The Scientific Diving Program serves the Center for Marine Science research community who use diving as a necessary tool to conduct their research. The UNCW Center for Marine Science

UNCW Center for Marine Science

2002 Strategic Plan

is an organizational member of the American Academy of Underwater Sciences (AAUS) and has agreed to abide by the AAUS diving standards. All diving applicants must have an approved diving physical and current certification in CPR, first aid, and oxygen administration. They will be required to pass a written test of diving knowledge and the information contained in the UNCW Diving Manual. A watermanship/scuba skills evaluation and an open water check out dive are also required. UNCW Certification is based on the individual's level of diving experience and training. The Center for Marine Science diving locker has 12 full sets of scuba gear, with access to air and enriched air nitrox in support of scientific diving activities.

C. Fixed Operations Services

(1) Seawater System

The Center for Marine Science provides seawater support services for aquaculture and other aquatic research activities at two locations: the Aquaculture Research Facility at Wrightsville Beach, and the CMS research facilities at Myrtle Grove.

The UNCW Aquaculture Facility has direct access to high quality seawater from Bank's Channel, a protected channel that is continually flushed from a natural ocean inlet. Bank's Channel and surrounding waters are designated as "Outstanding Resource Waters" by the state of North Carolina and are protected for recreational and shell fishing purposes. Seasonal seawater temperatures range from about 5°C to 30°C, with a year round average of about 20°C, making this region suitable for research with a variety of tropical, subtropical and temperate marine species. The seawater supply system consists of:

- (2) 30 hp pumps
- (2) 20,000 gallon unfiltered Water Storage Tanks
- 40-micron Sand Filter
- 1,000 gallon Filtered Water Storage Tank

The Seawater System at the main CMS research facility in Myrtle Grove provides both raw and filtered salt water from the adjacent Intracoastal Waterway to research laboratories, the aquaria room, the greenhouse and to outdoor tanks on the Aquaculture Pad. Three classifications of seawater are provided:

- Raw Seawater
- Medium Seawater (ozonated and sand-filtered)
- High Quality Seawater (Medium seawater processed through a three-stage micron filter) available at fill stations on the first and second floor of the research wing of the main CMS building.

(2) Instrument Maker Shop Services

The Center for Marine Science provides instrument maker shop services to support research projects in the field and in laboratories. The shops produce high pressure and low pressure cases for ocean bottom installations, oceangoing sampling devices, experimental set-ups for laboratory work, parts to rig research vessels, welded instrument frames for boats and sea-bottom

UNCW Center for Marine Science

2002 Strategic Plan

installation, underwater mountings for marine sensors, pump enclosures, frames and custom rigs for aquaculture projects, collecting equipment for marine sampling, and repairs of existing devices. The shops fabricate the equipment using a variety of materials, including: stainless steel, carbon steel, aluminum and alloys, delrin, polyethylene, PVC, acrylic, and wood.

Shop equipment includes: a drill press, vertical and horizontal band saw, stationary belt and disc sander, vertical milling machine, a 20" X 60" lathe, a plasma-arc cutter, oxy-acetylene torches, hydraulic iron worker, and an electric welding machine with AC/DC for stick, MIG, and TIG. Also, the shop is equipped with a 10" table saw and a broad assortment of power tools available to service most needs.

(3) Information Technology and Graphics Services

The Center for Marine Science offers the following equipment to assist and aid scientists with the preparation of scientific publications: a large format plotter for creation of charts and poster presentations; a color laser printer for publication quality graphics, i.e. 1200 dpi; a photo printer and 3 digital cameras for fast track photographic capability; we also have online 2 Polaroid film recorders for creation of slides and photos.

A full time graphic artist assists scientists with preparation of publication and presentation materials, and provides the capability for creation of original graphic art.

(4) Oceanographic Equipment Support Services

The Center for Marine Science maintains a small inventory of oceanographic equipment available for lease to researchers. An oceanographic equipment specialist is available to maintain the equipment and provide limited support to researchers for their specialized equipment.

7. Affiliated Activities (TBD)

Several organizations engaged in marine research and related activities maintain offices, laboratories and staff at the Center for Marine Science. Through their work at the Center, there are many opportunities for collaboration and synergy.

A. National Undersea Research Center

The National Undersea Research Center (NURC) at the University of North Carolina at Wilmington is funded by a grant from the National Oceanic and Atmospheric Administration as part of the National Undersea Research Program (NURP). NURP includes headquarters in Silver Spring, Md., and six regional centers. The center at UNCW supports undersea research off the southeastern United States, from N.C. to Texas. Center facilities and staff are located at the university's Center for Marine Science in Wilmington, N.C., and in Key Largo, Florida (where NURC maintains AQUARIUS, the only operational undersea research laboratory in the world).

B. UNCW Division of Public Service/Marine Quest

MarineQuest, specializing in marine science and environmental education programs for students of all ages, is a component of the UNC Wilmington Division for Public Service and Continuing Studies. These programs include Summer Science-by-the-Sea Day Camp, Coast Trek Residential

UNCW Center for Marine Science

2002 Strategic Plan

Program for Academically Gifted and Highly Motivated Students, MarineQuest Marine Science Study Trips, Oceanlab, River Ecology Excursions and Coastal Encounters. The MarineQuest Lab and staff office are located at the Center for Marine Science.

C. NC Sea Grant Extension Program

The North Carolina Sea Grant College Program maintains an Extension Office with a staff of three at the Center for Marine Science, working with other coastal and Great Lakes states in a network of 30 Sea Grant Programs to meet the needs of our society. Sea Grant molds the university functions of research, education and outreach into a program focused on the needs of agencies, people and businesses responsible for coastal and marine resources. Traditional philosophies of bringing new discoveries and knowledge to the public are the basis of our quest to build understanding and appreciation of the coastal ocean, wise use of its resources and better understanding and appreciation of its ecological bounty.

The wise use of coastal and marine resources benefits all citizens of North Carolina. Research projects focused on these resources are maximized through diverse outreach efforts. To meet these goals, the North Carolina Sea Grant Extension Program provides a professional, coordinated and responsive presence in the state. Sea Grant has a strong track record of bringing together university researchers, elected officials, government agencies, industry representatives and the general public to increase understanding and facilitate informed decisions regarding limited resources.

Fields of expertise in the Wilmington Extension Office include: commercial and recreational fishing, turtle excluder devices, bycatch reduction devices and bluefin tuna fishing, storm-resistant construction, erosion, effects of hurricanes on coastal buildings, coastal building codes and rip currents.

D. NC Coastal Reserve/National Estuarine Research Reserve

The National Estuarine Research Reserve (NERR) System protects and studies estuarine areas through a network of 25 reserves. The North Carolina Coastal Reserve and NERR maintain offices and laboratories at the Center for Marine Science, which is located immediately adjacent to the Masonboro Island Reserve.

The National Estuarine Research Reserves System helps to fulfill NOAA's stewardship mission to sustain healthy coasts by improving the nation's understanding and stewardship of estuaries. Established by the Coastal Zone Management Act of 1972, as amended, the reserve system is a network of 25 protected areas that represent different biogeographic regions of the United States.

Each reserve is a "living laboratory" in which scientists conduct research and educators communicate research results. Reserve staff members work with local communities and regional groups to address natural resource management issues, such as nonpoint source pollution, habitat restoration and invasive species. Through integrated research and education, the reserves help communities develop strategies to deal successfully with these coastal resource issues.

North Carolina's Estuarine system, the third largest in the country, encompasses more than *two million acres*. This system is the economic foundation of the coastal area. More than 90% of the commercial fish species caught in North Carolina spend some part of their lives in an estuary.

UNCW Center for Marine Science

2002 Strategic Plan

There are four individual components to the North Carolina National Estuarine Research Reserve:

- Currituck Banks
- Rachel Carson
- Masonboro Island
- Zeke's Island

E. UNCW Advancement/Marine Science Program Development

University Advancement is one of six administrative units at the University of North Carolina at Wilmington that report to the chancellor, and has as its goal to advance the university in all areas of public recognition, appreciation and support. The division includes all of the primary fundraising personnel for the university, as well as alumni relations, special event coordination, gift acknowledgment and receipting, donor research, annual giving programs, and planned giving services.

The Advancement Officer responsible for Advancement activities pertaining to the Center for Marine Science is based at the Center.

F. Lower Cape Fear River Program

The Lower Cape Fear River Program is a large-scale water quality and environmental assessment program covering the Cape Fear River Estuary and a large portion of the lower Cape Fear River watershed. A collaboration of academia, government, industry, and the public, the program is located at and administered by the Center for Marine Science at the University of North Carolina at Wilmington.

Program objectives are to develop an understanding of the fundamental scientific processes shaping and controlling the ecology of the Cape Fear River system and provide a mechanism for information exchange and public education. Numerous physical, chemical, and biological measurements are collected at thirty-four different sites on a regular basis so biologists, chemists, physicists, and geologists will be able to understand freshwater, estuarine, and near-shore marine processes in the Cape Fear River basin. This research will complement and refine the current basin-wide management plans being developed by the North Carolina Department of Environment and Natural Resources.

UNCW Center for Marine Science

2002 Strategic Plan

SECTION III: Strategic Plan: Global Goals, Goals, Objectives and Strategies

GLOBAL GOAL: RESEARCH

Goal Statement: The Research global goal seeks to support the mission of the Center by identifying and describing opportunities to improve research support at the Center. The underlying philosophy guiding this goal is a student-centric focus and interdisciplinary approach to marine science research, providing opportunities for education and research in all of the marine science disciplines.

Goal R.1. Support and expand opportunities for marine science research.

Objective R.1.1. Develop and maintain core research facilities to support increased avenues for single and multi-investigator research projects of faculty and graduate students.

Strategy R.1.1.1. Identify the needs and seek funds to maintain and expand the capabilities of the core facilities.

Strategy R.1.1.2. Establish a program of user fees for appropriate core Facilities. (Request analysis of core facility costs to determine fees).

Strategy R.1.1.3. Inform Faculty of new funding initiatives and on strategies for securing multidisciplinary funding sources.

Target Completion: Ongoing

Objective R.1.2. Provide boats, seawater facilities, machine shop services, engineering services, and graphic services.

Strategy R.1.2.1. Assess options for providing a dependable supply of water at seawater salinity.

Strategy R.1.2.2. Provide appropriate training and safety procedures for use of research vessels.

Strategy R.1.2.3. Develop procedures to minimize travel-time associated with frequent boat use (temp parking @ CMS, mooring @ CMS dock, Davits for small boats, etc.).

Strategy R.1.2.4. Relocate all operations to CMS Myrtle Grove (Machine shop, Boat operations, etc.)

Strategy R.1.2.5. Review and revise management hierarchy and services in operations to improve effectiveness and efficiency.

Strategy R.1.2.6. In recognition of growing cooperation with community resources, facilitate use of vessels provided by or in cooperation with conservation, state and private groups.

Target Completion: Ongoing

UNCW Center for Marine Science

2002 Strategic Plan

Objective R.1.3. Use the Pilot Project program to support and encourage projects that promote new ideas or new directions.

Target Completion: Ongoing

Objective R.1.4. Use emphasis areas/program groups to create opportunities for new initiatives and to develop in depth understanding of research areas for faculty and students.

Strategy R.1.4.1. Promote effective development of the emphasis area facilitation.

Strategy R.1.4.2. Proposals for research area focus groups should be evaluated in the context of contemporary research funding initiatives from NSF, HHF, Sea Grant, EPA, NOAA, etc (See strategy A-1-3).

Target Completion: Ongoing

Objective R.1.5. Objective R.1.5. Facilitate communication and interaction with business, government and other organizations to assess local, state and regional needs and opportunities.

Strategy R.1.5.1. Develop a plan for identifying and targeting grant program managers, representatives of local, state, and national government to invite to CMS for discussion of funding opportunities and CMS capabilities.

Strategy R.1.5.2. Develop and offer information program for business leaders and representatives of other appropriate organizations.

Strategy R.1.5.3. Develop a Friends of CMS organization.

Strategy R.1.5.4. Create a new position (Information Specialist) to act as a liaison between CMS scientists and the public and private sectors.

Target Completion: June 2003

Goal R.2. Enhance involvement of university students in a variety of research activities.

Objective R.2.1. Objective R.2.1. Develop internship program through establishing institutional support, soliciting grant funds and encouraging individual investigator support.

Strategy R.2.1.1. Identify funding resources for Internship Program for summer and or academic year interns for graduate students.

Strategy R.2.1.2. Develop policy for selecting graduate students to fill the summer and or academic year internships available.

Strategy R.2.1.3. Identify funding resources for Internship Program for summer interns for undergraduate students.

UNCW Center for Marine Science

2002 Strategic Plan

Strategy R.2.1.4. Develop policy for selecting undergraduate students to fill the summer internships available.

Target Completion: June 2003

Objective R.2.2. Encourage involvement of university students in seminars and discussion groups.

Objective R.2.3. Continue to support and expand “university days” on the R/V Cape Fear for student training.

Objective R.2.4. Provide logistical support and safety training to student to allow use of resources for research.

Objective R.2.5. Develop policy for volunteers to participate in research activities.

Target Completion: Ongoing

Goal R.3. Establish a Marine Science Post-doctoral training program & develop guiding policies.

Objective R.3.1. Encourage faculty to seek post-doctoral candidates to work with their research programs and serve as mentors for graduate and undergraduate students.

Target Completion: Ongoing

Goal R.4. Aid the dissemination of information about ongoing research to faculty, community members and managers.

Objective R.4.1. Seminar series to include outside invited speakers and faculty research.

Objective R.4.2. Continue to develop and upgrade the CMS Web site.

Objective R.4.3. Focus group coordinators providing overview of research in their focus areas for publications, presentations and web sites.

Objective R.4.4. Continue working with University Relations for dissemination of faculty and graduate student research results and to respond to press needs for timely information on current events.

Objective R.4.5. Publish a high quality information brochure in the form of an annual report or some other appropriate format.

Objective R.4.6. Task information specialist to disseminate information to intra-CMS(Sea Grant and NC Estuarine Reserve).

Target Completion: Ongoing

UNCW Center for Marine Science 2002 Strategic Plan

Goal R.5. Promote information exchange and collaborations in marine science among constituent institutions of the UNC System.

Objective R.5.1. Maintain visiting scientists space and make facilities available to faculty at other UNC campuses.

Objective R.5.2. Promote information dissemination of ongoing research efforts to emphasize collaborative efforts.

Objective R.5.3. Foster collaboration among UNCW faculty and among other UNC system researchers.

Strategy R.5.3.1. Represent UNCW at University wide and State Workshops.

Strategy R.5.3.2. Participate in statewide consortia and other types of Marine science meetings.

Strategy R.5.3.3. Advertise the CMS seminar series to marine scientists at other UNC campuses.

Target Completion: Ongoing

UNCW Center for Marine Science 2002 Strategic Plan

GLOBAL GOAL: EDUCATION

Goal Statement: Expand and improve marine science academic programs at all levels for students taking courses or conducting research in marine science, regardless of their degree program or faculty advisor.

Goal E.1. Develop the Master of Science in Marine Science Program to its full potential.

Background: This program is off to a good start since its beginning in 1998 with two students. It has grown rapidly to 36 students in the Fall Semester of 2001, and produced its first graduate in May of 2001. The program will need careful management during the next five years to maintain good productivity and faculty support.

Objective E.1.1. Maintain the optimum size of the student body for this program (24 – 40 students).

Strategy E.1.1.1. Increase the level of institutional support for this program and seek external funding for student assistantships and tuition support.

Strategy E.1.1.2. The number of UNCW GTAs should increase from six to twelve, the number of out-of state tuition remissions from six to twelve, and the number of in-state tuition scholarships from four to eight.

Target Completion Date: Ongoing

Objective E.1.2. Increase Graduate student stipends to a competitive level.

Strategy E.1.2.1. Define stipend level by comparison to the stipends at institutions with which we compete for students (for example UNCCCH.)

Strategy E.1.2.2. Place information about graduate student fellowships on the program web page, and encourage students to apply.

Target Completion Date: 2002

Objective E.1.3. Increase faculty input into directing the program

Strategy E.1.3.1. Advertise this program to faculty members in the pure sciences so they understand the differences and strengths of this program relative to the programs in the pure sciences.

Strategy E.1.3.2. Establish faculty liaisons within the departments to help match student applicants with potential faculty advisors.

Target Completion Date: 2002

UNCW Center for Marine Science 2002 Strategic Plan

Objective E.1.4. Obtain student input into program management

Strategy E.1.4.1. Establish a graduate student advisory committee.

Target Completion Date: 2002

Objective E.1.5. Develop a plan for maintenance and revision of the web page for the program, and create a graduate student web page.

Strategy E.1.5.1. Allocate part of a GTA for this.

Target Completion Date: 2002

Objective E.1.6. Strengthen the academic aspect of this program

Strategy E.1.6.1. Establish a marine science curriculum committee, who will recommend appropriate curriculum revisions (for example including the addition of Scientific Diving as an MSC course) and catalogue changes.

Strategy E.1.6.2. Modify regulations such that student committees must have faculty from at least two departments or, alternatively, two NC marine science campuses (NCSU, UNCCH, Duke, ECU), with at least two committee members from UNCW.

Strategy E.1.6.3. Better define the objectives of the journal clubs, along with the expectations for students with respect to participation in journal clubs and attendance at marine science seminars.

Target Completion Date: Ongoing

Objective E.1.7. Improve recruiting of potential students and advertising of the program

Strategy E.1.7.1. Prepare a display that faculty can take to scientific meetings

Strategy E.1.7.2. Make posters with tear-off cards.

Target Completion Date: 2002

Goal E.2. Increase the presence and involvement of undergraduate students at CMS.

Background: Most UNCW undergraduates, including science majors, do not visit CMS during their whole academic career. They therefore miss out on participation in activities at this excellent laboratory facility.

Objective E.2.1. Increase undergraduate research activity

Strategy E.2.1.1. Submit an NSF REU proposal, which includes a request for funding for ship time.

UNCW Center for Marine Science

2002 Strategic Plan

Strategy E.2.1.2. Encourage DIS and honors students to work in the marine sciences.

Strategy E.2.1.3. Work more closely with the Honor's Program.

Target Completion Date: 2003

Objective E.2.2. Develop a mechanism for teaching upper level courses and honors courses at CMS during the academic year.

Target Completion Date: Ongoing

Objective E.2.3. Teach some marine-related summer courses at CMS (ex. GLY 150).

Target Completion Date: 2002

Objective E.2.4. Investigate the feasibility of holding an undergraduate marine science research seminar once each year.

Strategy E.2.4.1. In some years this could be a statewide or regional symposium. This would give our program exposure, plus serve as a good recruiting tool for graduate students.

Target Completion Date: 2004

Goal E.3. Expand the Post-doctoral Fellow program

Background: Postdoctoral fellows enhance the research and educational environment at UNCW. They provide a continuous presence in the lab, thereby providing guidance for undergraduates and master's students' laboratory projects. UNCW is in a unique position to provide teaching experience to post-doctoral fellows, which will improve their knowledge of the academic environment as well as improve their marketability for university positions.

Objective E.3.1. Explore funding sources for post-doctoral fellowships.

Target Completion Date: Ongoing

Goal E.4. Improve instructional technology, including laboratory instrumentation, at CMS.

Target Completion Date: Ongoing

Background: Faculty and graduate students at CMS are somewhat isolated from the educational facilities in the pure science departments. It is important that state-of-the-art computers and laboratory instrumentation be acquired and maintained at CMS.

Objective E.4.1. Establish a computer lab for students at CMS.

Objective E.4.2. Implement periodic reviews of equipment and software to assess the working condition and analytical capabilities of instrumentation.

UNCW Center for Marine Science 2002 Strategic Plan

Objective E.4.3. Increase the level of technician support for computer, software and instrument maintenance.

Objective E.4.4. Improve instructional technology in classrooms at CMS.

Objective E.4.5. Improve video classrooms to take advantage of marine science courses offered by other universities.

Target Completion Date: 2001

Goal E.5. Increase opportunities for marine science students to participate in cruises and other types of fieldwork.

Target Completion Date: 2001

Background: Shipboard experience and experience in conducting field research are essential components of education in marine science. These activities distinguish marine science from the basic sciences.

Objective E.5.1. Obtain more ship time for marine science students

Strategy E.5.1.1. Fund increased use of the RV “Cape Fear” for courses.

Strategy E.5.1.2. Explore possibility of using the RV “Dan Moore” or other CFCC vessels for field trips for courses.

Strategy E.5.1.3. Include requests for ship time in REU proposals and other educational proposals.

Target Completion Date: 2002

Objective E.5.2. Consider making field or cruise experience a program requirement

Strategy E.5.2.1. Offer MSC 526 “Field or Cruise Sampling” every semester and look for opportunities to use this course as an avenue for students to gain experience.

Strategy E.5.2.2. The field or cruise experience requirement could be satisfied by completing MSC 526, CHM/PHY 576, or by extensive fieldwork associated with thesis work.

Target Completion Date: 2002

Goal E.6. Enhance faculty participation and productivity in marine science.

Target Completion Date: Ongoing

Background: An academic program is only as strong as its faculty. Faculty members benefit from assistance so they can remain productive and innovative in their research and teaching.

UNCW Center for Marine Science

2002 Strategic Plan

Objective E.6.1. Explore the possibility of providing regular teaching load reductions for CMS faculty whose primary office is at CMS during semesters that they teach courses on the main campus to compensate them for time spent in traveling.

Target Completion Date: 2002

Objective E.6.2. Address ways to increase collaboration among various disciplines and with other institutions.

Target Completion Date: Ongoing

Objective E.6.3. Provide a mechanism for developing additional marine-related courses, with the cooperation of the pure science departments.

Target Completion Date: 2002

Objective E.6.4. Ensure that new faculty members are made aware of library services and other university resources.

Target Completion Date: Ongoing

Goal E.7. Increase interaction among marine science faculty, especially between those at CMS and on the main campus.

Target Completion Date: Ongoing

Background: Casual interaction among scientists often generates new research ideas. It can also generate high morale in a working environment.

Objective E.7.1. Increase the opportunities for casual interaction among marine scientists and students. Provide critical journals, like *Science* and *Nature*, in the snack room.

Target Completion Date: Ongoing

Objective E.7.2. Look for opportunities to increase interaction and collaboration between campus and CMS faculty.

Target Completion Date: Ongoing

Objective E.7.3. Schedule a monthly social gathering for marine science faculty and students at 5 PM one Friday each month.

Target Completion Date: 2001

Objective E.7.4. Schedule the CMS seminar series so as not to conflict with departmental seminars. Encourage marine science faculty, both at CMS and on the main campus, to present their research during these seminars on a regular basis.

Target Completion Date: 2001

UNCW Center for Marine Science 2002 Strategic Plan

GLOBAL GOAL: ADMINISTRATION

Goal Statement:

The University of North Carolina at Wilmington embraces a broad definition of “Marine Science” and recognizes that research orientation rather than departmental affiliation is the principal criterion determining whether or not a particular faculty or staff member conducts marine science research. There are “resident” faculty/support staff members -whose offices and research labs are physically located in the Center for Marine Science building – and “main campus” faculty/support staff that collectively comprise the scientific staff of the Center. The Administration recognizes that these two groups may have different needs and obligations that must be considered in allocation of resources.

It is the role and responsibility of the Director to set goals for the UNCW Center for Marine Science. These will be both compatible with the educational and service missions of the University and will increase the regional, national, and international stature of the Center in the area of marine science research. It shall be the policy of the Center that the Director will solicit faculty and staff advice before formulating plans and procedures that will determine the direction of research or support efforts of the Center. The consensus of faculty and staff advice should constitute the framework for formulating plans and procedures for the Center insofar as is compatible with the Center’s mission. It also is the responsibility of the Director to foster successful ongoing activities and initiative new activities.

Goal A.1. Improve infrastructure management:

Objective A.1.1. Establish written procedures that ensure infrastructure support of the research, teaching, and service missions of the Center.

Strategy A.1.1.1. The Director should consult with the marine science faculty and staff

Strategy A.1.1.2. Written guidelines must ensure unbiased allocation of CMS resources (*e.g.* space, seawater use, boats, and internal funding).

Strategy A.1.1.3. Compile and distribute written guidelines to all marine science faculty and staff.

Target Completion Date: This goal should be accomplished by the end of spring semester 2002.

Goal A.2. Improve faculty governance:

Objective A.2.1. The Director, in consultation with the marine science faculty, shall establish and maintain committees necessary to the smooth functioning of all aspects of the Center.

UNCW Center for Marine Science

2002 Strategic Plan

Objective A.2.2. All policies established by such committees will be available to the marine science faculty in written form and will provide fair access to CMS facilities and services.

Target Completion Date: This goal should be accomplished by the end of spring semester 2002.

Goal A.3. Improve communications among marine science faculty.

Objective A.3.1. Hold regularly scheduled faculty meetings.

Strategy A.3.1.1. The Director should schedule regular meetings of marine science faculty to discuss upcoming issues and events at the Center and to solicit advice about the disposition or conduct thereof.

Strategy A.3.1.2. It is incumbent on the marine science faculty and staff to attend meetings at which their advice is solicited and to express opinions freely when asked.

Target Completion Date: This goal has been implemented and is ongoing.

Goal A.4. Support multiple approaches to marine research.

Objective A.4.1. The Director shall encourage both collaborative and individual research.

Target Completion Date: This goal has been implemented beginning of fall semester 2001 and is ongoing.

Goal A.5. Compensate resident faculty for additional time required to transit to main campus for classes.

Objective A.5.1. Adjust resident faculty workload. (See also E.6.1.)

Strategy A.5.1.1. The Director and relevant department chairs should establish a mechanism that will permit each resident faculty member to receive (on average) a one-half reduction in teaching load every fourth semester.

Strategy A.5.1.2. Establish a funding source to implement this reduction in teaching load.

Target Completion Date: This goal should be implemented by the end of spring semester 2002.

UNCW Center for Marine Science 2002 Strategic Plan

GLOBAL GOAL: COMMUNITY EDUCATION SERVICES (CES)

Goal Statement:

Becoming the premier provider on the East Coast of top quality projects and programs emphasizing “hands on” participation and specifically oriented toward building awareness and commitment to conserving the marine and aquatic environment. Possessing an image reaching across the entire mid-Atlantic region of a professional out-reach organization with educational services and a consumer focus at parity or better than other major east Coast providers of similar services. Projecting a unique identity, standing apart from other UNCW business and academic units, while functioning as the “front door” into CMS as part of the CMS organization. In so doing Marine Quest is allowing the outside world a view into CMS’s current activities and future plans. Marine Quest is also performing as an outlet for CMS to showcase its resources, areas of concentration and accomplishments and their relationship to the environment and the general community’s well being. In each of these aspects Marine Quest is actively promoting CMS’s image and reputation across broad geographies, building on its current national and international recognition. Producing an international community more educated on and enthusiastic about conserving and preserving the marine environment is likely to produce in that same community a willingness to support these efforts through scholarships, grants and other financial gifts to Marine Quest, CMS and UNCW and, potentially, future students and teachers of marine sciences

Goal CES.1. Transfer the Marine Quest Program to the Center for Marine Science

Objective CES.1.1. Develop and implement a Transition Plan to complete a smooth and seamless transfer of the Marine Quest department from PS&EE to CMS.

Strategy CES.1.1.1. Marine Quest will continue to be responsible for all aspects of design, implementation, and on-going support for revenue producing programs.

Strategy CES.1.1.2. Marine Quest will assume responsibility for current and future CMS outreach programs; e.g. Plant Ocean, National Science Bowl, and as yet unspecified fund-raising events.

Strategy CES.1.1.3. Marine Quest will become self-sustaining with responsibility and accountability for an operating budget.

Strategy CES.1.1.4. CMS will continue to provide lab space, facilities support, and manage Marine Quest’s capital funding needs.

Strategy CES.1.1.5. Marine Quest’s management will focus on new “products” which add value to CMS’s exposure, produce a more cohesive Marine Quest marketing/promotional program, design, produce and deliver advertising, promotional and instructional materials in a more timely and professional fashion. They will also be better able to focus on the planning, managing, creativity and leadership required of these positions.

Target Completion Date – March 2002 to have the administrative transfer completed

UNCW Center for Marine Science

2002 Strategic Plan

Goal CES.2. Become self-sufficient with full functional, administrative and fiduciary responsibility within CMS policies.

Target Completion Date - January 2003

Objective CES.2.1. Identify and install whatever administrative infrastructure (e.g. budget preparation and administration) and internal control procedures and practices are appropriate within Marine Quest consistent with CMS policies and supporting Marine Quest's transition to CMS.

Target Completion Date – July 2002 to have procedures and practices portfolio in place in time for new fiscal year.

Objective CES.2.2. Develop a multi-year Marine Quest Resource Requirements Plan (RRP).

Strategy CES.2.2.1. In conjunction with CMS management, identify requirements for staffing, funding, on-going curriculum development, technical education, and facilities.

Strategy CES.2.2.2. In developing this RRP, consider CMS's growth and operational strategies for Marine Quest.

Target Completion Date – January 2003 to have first version completed and approved by CMS management.

Objective CES.2.3. Develop a multi-year Information Technology Plan (ITP)

Strategy CES.2.3.1. Develop and implement a rational approach to introducing and maintaining technology aimed at enhancing the educational experience of program attendees whenever possible either on-site or remote.

Strategy CES.2.3.2. Improve the quality and timeliness (preparation and circulation) of advertising and promotional materials and dramatically improving the productivity and self-sufficiency of Marine Quest's staff.

Target Completion Date – July 2002 to have completed needs analysis and an approved approach and have installed at least one productivity aid (e.g. Marine Quest web page), all consistent with CMS's anticipated information technology strategy.

Goal CES.3. Integrate Marine Quest's Strategic Planning Process with CMS.

Objective CES.3.1. Complete Marine Quest's Strategic Business Plan, first begun in April 2001.

Strategy CES.3.1.1. Establish a long-term vision, mission and strategic direction for Marine Quest and the tasks necessary to move forward in support of CMS.

UNCW Center for Marine Science

2002 Strategic Plan

Strategy CES.3.1.2. Define Marine Quest's role and responsibilities vis-à-vis CMS as a partner, a catalyst for positive change and a CMS organizational member.

Target Completion Date – November 2001 for first iteration followed by quarterly assessments, annual reviews and updates.

Objective CES.3.2. Complete Marine Quest's contribution to CMS's consolidated 5-year plan.

Strategy CES.3.2.1. Integrate Marine Quest's Strategic Plan as part of the consolidated CMS 5 year plan.

Target Completion Date - October 2001

Objective CES.3.3. Develop a Strategic Marketing Plan.

Strategy CES.3.3.1. Establish and maintain an ongoing program using topical advertising and promotional techniques that position CMS and Marine Quest across a broad geographic and demographic universe as "one of the nation's premier marine science institutions in every sense".

Strategy CES.3.3.2. Position Marine Quest as CMS's "front door" to its many constituencies to reflect positively on CMS and on UNCW.

Strategy CES.3.3.3. Establish a "Marketing Advisory Committee comprised of CMS and Marine Quest and volunteers from the non-UNCW community with product marketing experience. This committee would work with the "Program Content Committee" to coordinate their efforts and ensure continuity for Marine Quest's programs.

Target Completion Date – April 2002 for first programs (Fall, 2002) and then on a seasonal basis corresponding with seasonal activities.

Goal CES.4. Develop a Program Evaluation process.

Objective CES.4.1. Establish and maintain an ongoing program where CMS and Marine Quest jointly evaluate Marine Quest programs periodically to determine which are consistent with future direction and work with CMS staff to identify new programs that support shared vision.

Strategy CES.4.1.1. Develop and administer criteria that aid in determining the "success" of individual programs.

Strategy CES.4.1.2. Develop new and updated program concepts and ideas that add more value to the CMS outreach commitment

UNCW Center for Marine Science

2002 Strategic Plan

Strategy CES.4.1.3. Work with CMS and Marine Quest to implement those new and updated program concepts that make educational and economic sense.

Target Completion Date –August 2002 for first evaluation of Spring and Summer 2003 Programs followed by on-going seasonal activities.
- October, 2002 (First major seasonal program evaluation and recommendations on-going on a continuing basis.)

Goal CES.5. Identify opportunities for “Cross-Fertilization.”

Target Completion Date - April 2002 (First major program completed, ongoing thereafter with annual assessments)

Objective CES.5.1. Develop an electronic directory of UNCW units and outside organizations drawing from the same market as CMS.

Strategy CES.5.1.1. Identify organizations for potential collaboration, with a description of who they are and their affiliations.

Strategy CES.5.1.2. Describe what these organizations do and their methods for conducting their activities.

Objective CES.5.2. Build close ties with and identify opportunities to collaborate and cooperate with these units and organizations with best complementary resources for mutual benefit.

Strategy CES.5.2.1. Assess their potential as an adjunct to CMS and Marine Quest programs.

Target Completion Date – April 2002 for this phase followed by initial contacts with organization representatives during balance of 2002 as work progresses on Projects CES4.4 and 4.2.

UNCW Center for Marine Science 2002 Strategic Plan

GLOBAL GOAL: ADVANCEMENT AND DEVELOPMENT

[TBD]

UNCW Center for Marine Science 2002 Strategic Plan

GLOBAL GOAL: TECHNOLOGY TRANSFER

[TBD]

UNCW Center for Marine Science

2002 Strategic Plan – Appendix A

APPENDIX A: “SCHOLARSHIP RECONSIDERED: PRIORITIES OF THE PROFESSORiate” by Ernest L. Boyer

In a recently released Carnegie report entitled *Scholarship Reconsidered*, we concluded that it's time to move beyond the tired old teaching versus research debate and instead begin to ask the much more compelling question: What does it mean to be a scholar? And in response to that intriguing question, we propose a new paradigm of scholarship with four interlocking parts.

I. The Scholarship Of Discovery

First, we take the position that research is at the very heart of academic life, and we celebrate what we call the scholarship of discovery. Fifty years ago, Vannevar Bush, former president of the Massachusetts Institute of Technology, put it this way: "Universities," he said, "are the wellspring of knowledge and understanding. And as long as scholars are free to pursue the truth, wherever it may lead, there will surely continue to be a flow of new scientific knowledge."

We urgently need great universities that excel in the scholarship of research, and frankly I worry about federal cutbacks in research dollars. I also worry about grant-making policies that would direct government funds away from basic research and, in the process, undermine the integrity of the investigative process. Research is a central ingredient of the academic life, and sustaining this creative process within the academy itself is absolutely crucial if scholarship is to be vigorously advanced.

II. The Scholarship Of Integration

But in addition to the scholarship of discovery, we also need what we call the scholarship of integration. We need creative people who go beyond the isolated facts, who make connections across the disciplines, who help shape a more coherent view of knowledge and a more integrated, more authentic view of life. And in our fragmented academic world, this task of integration becomes more urgent every single day.

Barbara McClintock, the Nobel laureate, said on one occasion that "everything is one. There is no way," she said, "to draw a line between things." Frank Press, the president of the National Academy of Sciences, recently suggested that the scientist is, in some respects, an artist, too; he went on to observe that "the magnificent double helix is not only rational, but beautiful, as well." And several years ago, when the world renowned physicist Victor Weiskopf was asked what gave him hope in troubled times, he replied, "Mozart and quantum mechanics." Weiskopf also said that to understand the Big Bang theory, you should listen to the works of Haydn. But how, in our fragmented academic world, can students make connections such as these?

The good news is that the most exciting work going on in the academy today is in the new hyphenated disciplines--psycholinguistics, bio-engineering, and the like--in what Michael Polanyi calls the "overlapping [academic] neighborhoods." In his provocative essay, "Blurred Genres," Clifford Geertz of the Institute for Advanced Study at Princeton University suggests that the old categories of knowledge are breaking down. "Something is happening," Geertz says, "to the way we think about the way we think." New disciplines are emerging in response to compelling intellectual questions.

UNCW Center for Marine Science

2002 Strategic Plan – Appendix A

In the days ahead, we urgently need scholars who move beyond the traditional academic boundaries and begin to put their learning in intellectual, social, and ethical perspective.

Nearly fifty years ago, Mark Van Doren wrote: "The connectedness of things is what the educator contemplates to the limit of his capacity." He concludes by saying that those who can begin early in life to see things as connected has begun the life of learning. And this, it seems to me, is what good scholarship is all about.

III. The Scholarship Of Application

This brings me to category number three. We say in the Carnegie report that beyond the scholarship of discovery and beyond the scholarship of integration, we also need what we call the scholarship of application; we need to relate the theory and research to the realities of life. This uniquely American view of the usefulness of knowledge is rooted in the land-grant colleges, in the polytechnic institutes, in the normal schools, in the conservatories--institutions that were, in the nineteenth century, "in the nation's service," as Woodrow Wilson put it.

But we are no longer in the nineteenth century: we are standing today on the threshold of the twenty-first. And there is now, I am convinced, an urgent new service agenda to be considered. Today our shorelines are polluted, the ozone layer may be threatened, our schools are dangerously deficient, our cities are imperiled.

I am convinced that university scholars urgently need to respond to the crises of this century just as they responded to the needs of agriculture and industry a century ago. How can we justify a university that is surrounded by pressing human needs and essentially ignores them? It's a failure not only intellectually, but ethically as well.

Donald Schon of MIT writes about what he calls "the reflective practitioner" and proposes a new epistemology of practice in which scholarship relates to service. The good news is that professional schools--from architecture, to medicine, to journalism, to education and accounting--increasingly are linking scholarship to real life. They are demonstrating that not only can knowledge be applied, but that theory can, in fact, emerge from practice and that good scholarship can occur in hospitals, in gyms, and in the schools, as well.

In the end, theory simply cannot be divorced from practice, and in developing new priorities for the professoriate, we simply must give new dignity and new status to the scholarship of application.

IV. The Scholarship Of Teaching

This brings me to my last category. We say in the Carnegie report that scholarship means not only the ability to discover and integrate and apply knowledge; it also means to inspire future scholars in the classroom--a process we call the scholarship of teaching.

Several years ago, I could not sleep, and instead of counting sheep, I tried to recall all the teachers I have had. I must confess there were a few nightmares in the bunch. But I also remember three or four outstanding teachers who not only knew their subjects, but knew their students, too. These wonderful mentors had a huge impact on my life. And I suspect that almost everyone in the audience today is here because of at least one inspired teacher.

I am suggesting that to keep scholarship alive, we need classrooms where there is active, not passive, learning; where students are creative, not conforming; and where undergraduates learn to

UNCW Center for Marine Science

2002 Strategic Plan – Appendix A

work together, rather than compete, since in the coming century the truly consequential human problems will be resolved only through collaboration.

But there is a dark cloud to this silver lining. The problem is that in the academy today, good teaching simply is not adequately rewarded. We assign undergraduate instruction to teaching assistants. And very often it's far better for a professor to deliver a paper at a convention at the Hyatt in Chicago than it is to meet with undergraduates back home. And this is truly sad, since to short-change teaching is to short-change scholarship itself.

If students are not stimulated by great teachers, if they do not become intellectually engaged in creative learning, then all the talk about scholarship in its richest, fullest sense will be simply a diversion.

Robert Oppenheimer, at the 200th anniversary of Columbia University, put it this way. He said, "It is proper to the role of the scientist that he not merely find the truth and communicate it to his fellows, but that he teach, that he try to bring the most and intelligible account of new knowledge to all who will try to learn." And surely this means inspiring future scholars in the classroom.

Here, then, is my conclusion. Scholarship surely means the discovery of knowledge, as in research, but that is only the beginning of the process. Scholarship, to be complete, also means the integration of knowledge. It means the application of knowledge. And it means the presentation of knowledge, as in great teaching. And while this full range of scholarship can flourish on a single campus, I am convinced that every college and university should also seek to find its own special niche within the spectrum.

Let us have great research centers, for example, where undergraduate instruction also will be honored. Let us have campuses where the scholarship of teaching is a central mission. Let us have colleges and universities that promote integrative studies through a core curriculum, through interdisciplinary seminars, and through team teaching. And let us also have colleges and universities that give top priority to the scholarship of applying knowledge, in schools, in hospitals, in industry and business, much as the land-grant colleges worked with farmers. What I am suggesting is a national network of higher learning institutions in which each college and university takes pride in its own distinctive mission and seeks to complement, rather than imitate, the others.

Where do faculty fit into all of this? In the days ahead, I would like to see faculty members be given lots of freedom to be creative and to build on their own unique aptitudes and interests. Those who are "integrators," for example, or those who enjoy field work, or those who excel as scholars in the classroom should be rewarded for these special talents alongside researchers--and be considered of equal worth. What I am proposing, in short, is a mosaic of faculty talent on the campus.

A final observation. In the Carnegie report, we focused on the work of scholars across a lifetime and concluded that faculty should have a change of pace from time to time. Specifically, we propose what we call "creativity contracts" for professors--or arrangements in which members of the faculty could move from one scholarly endeavor to another.

During one contract period, for example, a professor might focus primarily on research. Later, he or she might take time to integrate and interpret findings. At another period in life, the professor might work full time on the scholarship of teaching. Any of these activities would be carefully assessed and appropriately rewarded. In other words, a "broken field" approach to scholarship would keep faculty intellectually alive and bring creativity to a restrictive system.