

MEMORANDUM

TO: President Edward T. Foote II
FROM: George C. Alexandrakis Chairman, Faculty Senate GCA
DATE: June 21, 1991
SUBJECT: Faculty Senate Legislation #90009(B) - Program in Environmental Science

The Faculty Senate Council, acting on behalf of the Faculty Senate, at its meeting of June 19, 1991, voted to approve Faculty Senate Legislation #90009(B) - Program in Environmental Science. The Senate Council was authorized to act on this matter, on behalf of the Faculty Senate, at its meeting of April 29, 1991. The text of the legislation is attached.

This legislation is forwarded to you for your action.

GCA/b
Attachment
cc: Provost Glaser

Handwritten notes: 7/2/91, George, Done!, Thanks!, Get some rest!, Best, [Signature]

PROGRAM IN ENVIRONMENTAL SCIENCE

June 20, 1991

Committee:	Ron Hofstetter	Biology
	Jonathan West	Political Science
	Lora Fleming	Epidemiology and Public Health
	Tom Briggie	Epidemiology and Public Health
	Peter Swart	Marine Geology and Geophysics
	Frank Millero	Marine and Atmos. Chemistry
	Linda Farmer	Marine Science Program

INTRODUCTION

The multidisciplinary field of environmental science is one of the fastest growing areas of employment today. Workforce 2000, a publication of the Hudson Institute predicts a 70% increase in the positions in natural and environmental sciences by the year 2000. Florida Trends and Forbes also project increasing labor needs in diverse areas of environmental science and management.

A number of universities have recognized the demand for training in ecological and environmental sciences and responded with curricula that include introductory courses for the educated voter, technical majors focused toward the job market, research oriented programs, and interdisciplinary graduate programs.

Our review of external programs included those of Johns Hopkins University, Duke University, the University of Wisconsin, the University of Michigan and the University of Kansas. (Appendix 1) All provide interdisciplinary graduate degrees as well as more focused and departmentalized offerings in ecology, toxicology, etc. Some courses are available to undergraduates; Johns Hopkins, Kansas and Stanford offer full majors. Others schools provide areas of concentration within basic science majors or programs in agriculture and forestry or certificate programs. We were most impressed with the University of Kansas' outline, which provides for roughly two years of basic science and core courses and two years of more focused offerings in a variety of tracks leading to a Bachelor of Science degree.

STRUCTURE OF THE PROGRAM

The Committee strongly recommends the establishment of a Program in Environmental Sciences, roughly following the models of the Marine Science and International Studies Programs. Environmental Science is by nature interdisciplinary. Students interested in the field need to be exposed to interests beyond those of present departmental lines. In addition, the most successful undergraduate programs we reviewed are those that provide the student with a home base for advising and extra-curricular activities, as well as academic projects and internships. A program will also serve as forum for faculty interaction and collaboration.

The proposed program will be administered by a Director and a faculty steering committee. In consultation with the faculty steering committee and the other deans, the dean of the College of Arts and Sciences will appoint the director. Members of the faculty steering committee will be selected for each of the tracks by the deans and councils of the involved schools. Initially these are Environmental Geology (A&S), Chemistry/Toxicology (A&S), Environmental Health Sciences (Medicine), Environmental Engineering Science (Engineering), Ecosystem Analysis (A&S), Wildland and Wildlife Management (A&S), Marine Environmental Systems (RSMAS), Environmental Systems Analysis (Business), and Environmental Policy (Business). The steering committee will be chaired by the Director. The Director is responsible to the dean of the College of Arts and Sciences and to the

Steering Committee for all matters relating to the program's educational, research, and administrative affairs in accordance with section X.10.1 of the Faculty Charter. The Steering Committee will be responsible for the overall development of the program, curricular coordination, student advising, recruitment of students, extramural funding, and individual members will facilitate interaction with home departments.

CURRICULA

The proposed curricula are designed for those students who wish to pursue careers in areas of environmental science following the completion of Master's level studies. The program does not focus specifically upon the research oriented student, but attempts to provide an interdisciplinary background with analytical and communication skills and practical hands on experience. It is expected that some students will choose to seek employment upon completion of a Bachelors degree, others will choose doctoral studies, but for the majority, the Masters will be the terminal degree.

Our committee proposes curricula in environmental sciences leading to a Bachelor of Arts or to a Bachelor of Science degree. We strongly encourage students to continue in extant interdisciplinary Masters programs, and we hope to work to further develop graduate offerings as the undergraduate program gains support.

For the present, we propose a curriculum that includes distributional requirements, a basic science core and a core in environmental science. Upper division courses are divided into tracks to provide area specialization in environmental geology, chemical toxicology, marine environmental systems, ecosystem analysis, wildlife management, public policy, environmental decision making, environmental engineering science and environmental health sciences.

We originally intended that a single environmental science major would be offered by the program with tracks in the above mentioned areas; however, several faculties have expressed the desire to participate in the program but to retain students as departmental rather than environmental science majors. For the track in wildlife management, students will take 8 credits of biology in the science core, 20 credits in the "option" track and a 4 credit internship. The department of biology has approved this curriculum as acceptable for a biology major. Other "tracks" that have current approval as extant majors include marine environmental systems (Marine Affairs A&S/RSMAS), environmental systems management (Management Science/ Business), and environmental engineering science (CEN/Engineering). Two additional tracks--environmental geology and environmental policy--are being considered for major approval by the departments of geological sciences and political science.

The three remaining tracks--environmental health sciences (Microbiology, Civil Engineering and Epidemiology), ecosystem analysis (Biology, Geological Sciences, Geography), and chemical toxicology (Chemistry, Epidemiology, RSMAS)--are more interdisciplinary and do not satisfy requirements for any extant major. We propose approval of these curricula as new majors in environmental science per se. In general Bachelor of Arts degree requirements can be completed with 105 credits plus 15 credits of electives, but the Bachelor of Science programs extend from 120-126 credits as proposed.

In summary, students seeking a Bachelor of Arts degree will choose an extant major in Political Science with a specialization in Environmental Policy or an extant major in Marine Affairs; students seeking a Bachelor of Science degree will select a new major in Environmental Science with specialization in Ecosystem Analysis, Chemical Toxicology, or Environmental Health Sciences; or a major in Biology with a specialization in Wildlife and Wildland Management (extant), Geology with a specialization in Environmental Geology (extant), Engineering Science with a specialization in Environmental Engineering Science (extant), or Management Science with a specialization in Environmental Systems Management (extant).

The curricula outlined are proposed as a basis for discussion, not for final approval. New interdisciplinary courses must be developed and approved, and some extant courses may be modified. The preliminary response of the faculty has been very enthusiastic, and many more people may wish to share their insights.

IDENTIFIED NEEDS:

1. PERSONNEL:

Faculty expertise in several key areas is crucial for the initiation of this program:

- Risk management
- Natural resource economics
- Hydrology
- Soil Science
- Cartography/GIS mapping
- Environmental policy/regulation

In addition, the program will also need a full-time director, and release time for appropriate faculty from duties in their home departments. In the third year of the program, a coordinator may be added to assist with internship placements and office administration.

2. FACILITIES & EQUIPMENT:

To operate effectively as an undergraduate teaching program environmental studies will need a central office with 3-4 faculty areas for advising, a central teaching laboratory, several smaller student lab/prep. areas and a stockroom/equipment storage area.

Equipment needs are critical, expensive, and not available on the Coral Gables campus. Major items include: high-pressure liquid chromatograph (HPLC), gas chromatograph, autoanalyzer, high speed refrigerated centrifuge, -70 freezer, routine lab spectrophotometers, balances, glassware and chemicals. In addition, since the facilities involved are located on four campuses, a van for transportation will be crucial.

Lab computers, software and Vax time will also be required. In addition, communication networks between the different facilities is key. Partial networks have been established, but will need to be specifically upgraded for these purposes.

PROJECTED ENROLLMENTS AND REVENUES

Year 1 Fall 1992	20 New students (incremental)
	<u>30</u> Crossover students
	50
Year 2 Fall 1993	30 New students
	15 Returning incremental students
	<u>40</u> New and returning crossover students
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Year 3 Fall 1994	40 New students
	35 Returning incremental students
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APPROVED BUDGET YEAR 0 (1991-92)

Director's supplement/Replacement cost	(negotiated with Dean)
Small supplies, publications, etc. budget	(negotiated with Dean)

APPROVED BUDGET YEAR 1* (1992-93)

Director's Supplement/Replacement cost	(negotiated by Dean)	
PT Policy/Risk (@ 28.5% CFB)	2,000	
PT GIS (@ 28.5% CFB)	2,000	
CWS	500	
Fringe Benefits	1,140	
Publication/Mail	2,500	
Phone/Fax	1,500	
Office Supplies	2,000	
Computer/Software	4,500	
Van (1/3)	<u>6,000</u>	
Total	22,140	+ Director's cost, and extra secretarial assistance if warranted by enrollment

*Remuneration for RSMAS and medicine faculty teaching in new majors is not included. An appropriate fraction of such salary will be paid, as negotiated among provost and deans involved. At RSMAS, and perhaps medicine, if the faculty member is unfunded, no spendable dollars will be provided, but a credit towards deficit reduction will be given.

The budget for years two and three is tentative and will be adjusted if enrollment projections are not met.

YEAR 2 ** (1993-94)

Director	(Negotiated)	
Secretary (@29% CFB)	16,000	
Line Policy/Risk(POL) (@28.5% CFB)	17,500	(1/2 line, if viewed as necessary)
PT Cartography (@ 28.5% CFB)	4,000	
CWS	750	
Fringe	10,768	
Pubs	1,500	
Phone/Office	3,000	
Computers for lab	9,000	
Van (1/3)	6,000	
Environmental Lab Set-up	50,000	(\$10,000 from U budget; remainder from gifts and grants)
Transportation of students	3,000	
Computer time	<u>3,000</u>	
Total	124,518	+ Director's cost

YEAR 3 ** (1994-95)

Director	(negotiated)	
Secretary (@29% CFB)	16,900	
CWS	1,500	
Line Risk/Policy (@28.5% CFB)	18,550	(1/2 line, if viewed as necessary)
Line Cartog (GEG) (@28.5% CFB)	17,500	(1/2 line, if viewed as necessary)
Coordinator (@28.5% CFB)	24,000	
Grad TA	12,000	
Fringe	22,015	
B Budget	14,500	
Van	6,000	
Lab Equipment & Supplies	15,000	
Transportation	<u>3,000</u>	
Total	150,965	+ Director's cost

**Possible costs of remuneration of RSMAS and Medicine faculty is not included (see above).

When estimating the enrollment increase due to "incremental" students, as opposed to cross-overs, the 1990-91 level of marine science majors will be adjusted for the overall enrollment change. Total enrollment in marine science plus environmental science will then be compared with this adjusted base to determine incremental students.

PROPOSED CURRICULA FOR THE BACHELOR OF SCIENCE

GENERAL DISTRIBUTION

English composition	6 cr
Language	9
Humanities	12
Social Science	12
Mth 111 and 112	8

47 cr

SCIENCE CORE

Bil 111 and 112	8
Chem 111 and 112	8
Chm 201,202	8
Phy 101,102	8
GSC 150	4
Statistics	3
Comp. Prog	3

42 cr

ENVIRONMENTAL SCIENCE CORE

Introduction	MSC 117	2
Internship	New	4
Regulation \Risk		
Management	New	3
Environmental	New	3
Science		

12 cr

SPECIALIZATION TRACKS

(*Courses are shared electives in more than one track)

Environmental Geology

(Numbering under revision currently)

Sedimentology	4
Stratigraphy	4
World Geology	3
Mineralogy & Petrology	4
Geochemistry	3
<u>Electives</u>	
Hydrology*	3
Structural Gel	3
Soil Science*	3
Environmental Gel.	3

Environmental Chemistry/Toxicology

CHM 316 Instrumental Analytical Chem.	4
CHM 304 Spectrometric Organic Chem.	4
ES xxx Introduction to Toxicology	4
EPI 541 Integ. Aspects of Env.Health	3
<u>Electives</u>	
CEN 530 Water and Wastewater Engin.*	3
IEN 554 Industrial Toxicology	3
MEN 520 Air Pollution	3
BLR 550 Anal. Tech. in Marine Biol	2
MGG 581 Anal. Methods in Geochem	2
EPI&PH 581 Medical Toxicology	3
EPI Integrated Asp. of Env. Health	3
GSC Soil Science*	3
MSC 330 Marine Pollution	3

Ecosystem Analysis

BIL 330 Ecology	4	
BIL 338 Ecology of S. Florida	3	
MEN 530 Remote Sensing	3	or
GEG 452 Air Photo Interp.	3	
GSC XXX Soil Science*	3	or
GSC XXX Hydrology*	3	
<u>Electives</u>		
BIL 326 Plant Taxonomy	4	
BIL 538 Wetland Ecology	3	
GEG 201 Phy. Geography: Physiography	3	
GEG 202 Phy. Geg: Climatology	3	
GSC XXX Soil Science*	3	
GSC XXX Hydrology *	3	
CHM XXX Env. Chem	3	

Wildland and Wildlife Management

BIL XXX Populations, Resources and the Environment	3
BIL 211 Genetics	3
BIL 330 Ecology	4
BIL 338 Ecology of S. Florida	3
<u>Electives</u> (One from each section)	
Section A	
BIL 221 Biology of Birds	4
BIL 326 Plant Taxonomy	4
BIL 522 Biology of Insects	4
BIL 525 Herpetology	3
BIL 527 Biology of Fungi	4
BIL 528 Algae	4
BIL 529 Higher Vascular Plants	4

Section B

BIL 241 Animal Behavior	4
BIL 331 Vertebrate Ecology	4
BIL 335 Tropical Field Biology	3
BIL 360 Animal Physiology	3
BIL 365 Endocrinology	3
BIL 536 Plant Ecology	4
BIL 538 Wetland Ecology	3
BIL 541 Ethology & Behav. Ecol.	3
BIL 531 Advanced Field Ecology	5
BIL 562 Ornithology	4

Environmental Health Sciences

MIC 301 Micro.& Immuno.	4
BIL 322 Parasitology	
or MIC 322 Med. Parasit.	4
BCH 401 Biochemistry	3
EPI xxx Applied Epidemiology	4
ES xxx Intro. to Toxicology *	4
EPI 541 Int. Asp. of Env. Health*	3

Electives

EPI&PH Food Hygiene	4
MIC 323 Path. Bact.	3
MIC 436 Med. Virology	3
BIL 511 Biometry	3
MIC 452-3 Projects	2-4
CEN 530 Wastewater Eng.	3
CEN 540 Sanit. Eng*	3
CEN 541 Env. Micro*	3

Environmental Engineering Science

CEN 210 Mechanics of Solids	3
CEN 330 Fluid Mechanics	3
CEN 340 Intro. Envir. Engin.	3
CEN 430 Applied Hydraulics	3
CEN 440 Design of Water Quality	
Control Systems	3
MIC Microbiology	4

Electives

CEN 530 Water and Wastewater	
Engineering	3
CEN 531 Engin. Hydrology	3
CEN 540 Sanitary Engin. Chem.	3
CEN 541 Public Health and Env. Micro.	3
CEN 542 Modeling Environmental	
Processes	3

BACHELOR OF ARTS**GENERAL DISTRIBUTION**

English composition	6	
Language	9	
Humanities	15	
Social Science	15	(includes ECO 211, GEG 105, 2 HIS courses, POL 211
Mathematics	6	51 cr.

SCIENCE CORE

Biology 103	3	
Chemistry	6	
Physical Science	3	
Computer Prog.	3	
Statistics	3	
Advan. Writing	3	21 cr.

ENVIRONMENTAL SCIENCE CORE

Introduction	MSC 117	2 cr.	
Internship	New	4 cr.	
Regulation/Risk Management	New	3 cr	
Environmental Science	New	3 cr	12 cr.

Bachelor of Arts Program in Public Policy

POL 321 Public Policy and Administration	3
POL 450 Management and Soc.	3
POL 524 Budget and Fin. Management and Administration	3
MAF 502 Eco. of Nat. Resources	3

Electives

MSC 313 Coastal Law	3
MSC 314 Ocean Law	3
MAF 521 Envir. Law	3
EPI 541 Int. Asp. of Env. Health*	3
GEG 404 Eco. GEG	3
GEG 451 Cartography	3
GEG 452 Air Photo Interp.	3
GEG 453 Geo Processing	3
INS -- New Courses in Process	

Environmental Systems Management

Students in this track would include the science core and the ES core subjects, but would fulfill distribution requirements of the School of Business. Their Management Science major is extant with 18 credits in MAS courses and 18 credits in CIS.

Marine Environmental Systems (Marine Affairs)

Students in this track would fulfill A&S distribution requirements, science core and ES core in addition to their current 24 credit major in Marine Affairs

CAPSULE:

Faculty Senate Legislation #90009(B) - Program in
Environmental Science

RESPONSE BY THE PRESIDENT:

DATE: 7/2/91

APPROVED: Go [Signature]

OFFICE OR INDIVIDUAL TO IMPLEMENT OR PUBLISH: Provost

EFFECTIVE DATE OF LEGISLATION: _____

NOT APPROVED AND REFERRED TO: _____

REMARKS (IF NOT APPROVED): _____

FILE COPY

MEMORANDUM

TO: Provost Luis Glaser
FROM: George C. Alexandrakis
Chairman, Faculty Senate
DATE: April 25, 1991
SUBJECT: Your Memorandum Dated April 24, 1991

I believe that for as long as there is a Faculty Senate there is no need to worry that Stanford, or Duke, or Columbia, is going to beat the University of Miami in the establishment of an important program.

GCA/b

cc: President Edward T. Foote II

Report from the Task Force on Faculty Productivity and Reward System

It was agreed that the Senate Council would debate the report, develop a position, and make a recommendation to the Senate as early as possible.

Division of the Department of Teaching and Learning (Second Reading)

It was *moved* and seconded to accept the division of the Department of Teaching and Learning. The *motion carried*.

Bylaws for the School of Continuing Studies (Second Reading)

It was *moved* and seconded to defer this matter until the Senate Council makes a recommendation to the Senate. The *motion carried*.

Amendment to *Faculty Manual*, Section 9.6.2 (Second Reading)

It was *moved* and seconded to accept the amendment. The *motion carried*.

Senate Budget Committee Report

The Chairman informed the Senate that the annual report of the Budget Committee was attached to the agenda for this meeting.

Program in Environmental Studies

The Chairman reminded the Senate about the urgency of discussing the Environmental Studies Program. Professor Awad, Chairman of the Committee to review the program, summarized the discussions. There were three issues: 1) governance, 2) the role of the director; and 3) the curriculum. Governance would be determined by representatives from each of the schools. Major departments participating in the program would form a council to review all aspects of the program. The council would also review the candidates for directorship submitted by the Dean of the College of Arts and Sciences, and only with their approval would the Dean make the appointment. There is no resolution as to how the compensation would be made for members of those schools who participate and are not

members of the College of Arts and Sciences. The core curriculum consists largely of four parts: an introductory part, a scientific part, a policy and legal part, and finally an internship. It was *moved* and seconded that the Senate authorize the Council to act on this matter during the summer, circulating the draft proposal to the senators for comments and reviewing the matter when the Senate reconvenes in the fall as an information item. The *motion carried*.

It was *moved* and seconded to express admiration and appreciation to Professor Alexandrakis for his hard work and dedication to the welfare of the Faculty. The *motion carried unanimously*.

The meeting adjourned at 6:00 p.m.

Clarisa Alvarez

Proposal for Bachelor's Degree in Meteorology

Dean Wilson from the College of Arts and Sciences introduced the proposal for a Bachelor's Degree in Meteorology. He explained that this program will have heavy input from the Faculty of RSMAS. The program will allow the students to satisfy a double major in Meteorology as well as in Mathematics. Professor Farmer, from the Department of Biology, summarized the proposal. Discussion about curriculum, budget and facilities followed. It was agreed to appoint a committee to review the questions raised from the proposal referring to the curriculum, the rationale for courses on applied sciences versus broad basic courses, mathematics being an example, the absence of chemistry, and other related curriculum matters, as well as the budget and the budgetary projections based on different numbers of students, and finally the transportation issue. The Committee, chaired by Professor Eckstein, will be formed by Professors Brass, Greenfield, and Lorton.

Proposal for a Program in Environmental Science

Dean Wilson from the College of Arts and Sciences presented the proposal for the Environmental Science Program. The schools that will probably be involved in the program included Engineering, Medical School, RSMAS, and the Business School in addition to several different departments within the College of Arts and Sciences. The program will be drawn from new tracks within existing degree programs and majors; for example, Biology has already approved a track that will be included within this program. Moreover, the program will coordinate a set of tracks that are not under a single department but under different entities around the University as the Environmental Health Sciences and the Chemical Toxicology tracks. Professor Linda Farmer from the Department of Biology answered questions pertaining to new faculty needs, budgetary needs, and curriculum matters. Professor Brass informed the Council that the faculty at Rosenstiel School felt that the curriculum of the program was considered to be a narrow reflection of the courses they offered at the School, in particular the Division of Marine Biology and Fisheries. The Chair noted that Physical Science was also missing from the Science core. Professor Victoria from the School of Architecture asked if the environmental courses offered through Architecture could be included in the program. A discussion of administrative costs followed. It was agreed that the Faculty Senate Ad-hoc Committee that reviewed the program will have to solve several problems present in the proposal. First, the name of the degree offered, Bachelor of Arts and Sciences, has to be specified in the proposal. Second, problems about the prerequisite courses have to be solved. Third, the process to select the director and the steering committee to administer the program has to be specified. Fourth, a solution to the problem of transportation has to be presented. After discussion the members for the Committee to review the Environmental Science Program were appointed. The Committee, chaired by Professor Awad, is to be formed by Professors Green, Wilson and Clingan.

PROPOSED PROGRAM IN ENVIRONMENTAL SCIENCE

May 16, 1991

Committee:	Ron Hofstetter	Biology
	Jonathan West	Political Science
	Lora Fleming	Epidemiology and Public Health
	Tom Briggie	Epidemiology and Public Health
	Peter Swart	Marine Geology and Geophysics
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facilitate interaction between the program and their home departments. This committee and the director will be responsible for the overall development of the program, recruitment of students, and extramural funding. The steering committee is expected to be involved in all major decisions related to the program. In the third year of the program, a coordinator may be added to assist with internship placements and office administration.

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Line Policy/Risk(POL) (@28.5% CFB)	17,500	(1/2 line, if viewed as necessary)
PT/OT Cartography (@ 28.5% CFB)	4,000	
CWS	750	
Fringe	10,768	
Pubs	1,500	
Phone/Office	3,000	
Computers for lab	9,000	
Van (1/3)	6,000	
Environmental Lab Set-up	50,000	(\$10,000 from U budget; remainder from gifts and grants)
Transportation of students	3,000	
Computer time	<u>3,000</u>	
Total	124,518	- Director's cost

YEAR 3 ** (1994-95)

Director	(negotiated)	
Secretary (@29% CFB)	16,900	
CWS	1,500	
Line Risk/Policy (@28.5% CFB)	18,550	(1/2 line, if viewed as necessary)
Line Cartog (GEG) (@28.5% CFB)	17,500	(1/2 line, if viewed as necessary)
Coordinator (@28.5% CFB)	24,000	
Grad TA	12,000	
Fringe	22,015	
B Budget	14,500	
Van	6,000	
Lab Equipment & Supplies	15,000	
Transportation	<u>3,000</u>	
	<u>150,965</u>	+ Director's cost

**Possible costs of remuneration of RSMAS and Medicine faculty is not included (see above).

When estimating the enrollment increase due to "incremental" students, as opposed to cross-overs, the 1990-91 level of marine science majors will be adjusted for the overall enrollment change. Total enrollment in marine science plus environmental science will then be compared with this adjusted base to determine incremental students.

PROPOSED CURRICULA FOR THE BACHELOR OF SCIENCE

GENERAL DISTRIBUTION

English composition	6 cr
Language	9
Humanities	12
Social Science	12
Mth 111 and 112	8

47 cr

SCIENCE CORE

Bil 111 and 112	8
Chem 111 and 112	8
Chm 201,202	8
Phy 101,102	8
GSC 150	4
Statistics	3
Comp. Prog	3

42 cr

ENVIRONMENTAL SCIENCE CORE

Introduction	MSC 117	2
Internship	New	4
Regulation/Risk Management	New	3
Environmental Science	New	3

12 cr

SPECIALIZATION TRACKS

(*Courses are shared electives in more than one track)

Environmental Geology

(Numbering under revision currently)

Sedimentology	4
Stratigraphy	4
World Geology	3
Minerology & Petrology	4
Geochemistry	3
<u>Electives</u>	
Hydrology*	3
Structural Geol	3
Soil Science*	3
Environmental Geol.	3

Environmental Chemistry/Toxicology

CHM 316 Instrumental Analytical Chem.	4
CHM 304 Spectrometric Organic Chem.	4
ES xxx Introduction to Toxicology	4
EPI 541 Integ. Aspects of Env.Health	3
<u>Electives</u>	
CEN 530 Water and Wastewater Engin.*	3
IEN 554 Industrial Toxicology	3
MEN 520 Air Pollution	3
BLR 550 Anal. Tech. in Marine Biol	2
MGG 581 Anal. Methods in Geochem	2
EPI&PH 581 Medical Toxicology	3
EPI Integrated Asp. of Env. Health	3
GSC Soil Science *	3
MSC 330 Marine Pollution	3

Ecosystem Analysis

BIL 330 Ecology	4	
BIL 338 Ecology of S. Florida	3	
MEN 530 Remote Sensing	3	or
GEG 452 Air Photo Interp.	3	
GSC XXX Soil Science*	3	or
GSC XXX Hydrology *	3	

Electives

BIL 326 Plant Taxonomy	4
BIL 538 Wetland Ecology	3
GEG 201 Phy. Geography: Physiography	3
GEG 202 Phy. Geg: Climatology	3
GSC XXX Soil Science*	3
GSC XXX Hydrology *	3
CHM XXX Env. Chem	3

Wildland and Wildlife Management

BIL XXX Populations, Resources and the Environment	3
BIL 211 Genetics	3
BIL 330 Ecology	4
BIL 338 Ecology of S. Florida	3
<u>Electives (One from each section)</u>	
Section A	
BIL 221 Biology of Birds	4
BIL 326 Plant Taxonomy	4
BIL 522 Biology of Insects	4
BIL 525 Herpetology	3
BIL 527 Biology of Fungi	4
BIL 528 Algae	4
BIL 529 Higher Vascular Plants	4

Section B

BIL 241 Animal Behavior	4
BIL 331 Vertebrate Ecology	4
BIL 335 Tropical Field Biology	3
BIL 360 Animal Physiology	3
BIL 365 Endocrinology	3
BIL 536 Plant Ecology	4
BIL 538 Wetland Ecology	3
BIL 541 Ethology & Behav. Ecol.	3
BIL 531 Advanced Field Ecology	5
BIL 562 Ornithology	4

Environmental Health Sciences

MIC 301 Micro.&Immuno.	4
BIL 322 Parasitology	4
or MIC 322 Med. Parasit.	4
BCH 401 Biochemistry	3
EPI xxx Applied Epidemiology	4
ES xxx Intro. to Toxicology *	4
EPI 541 Int. Asp. of Env.Health*	3
<u>Electives</u>	
EPI&PH Food Hygiene	4
MIC 323 Path.Bact	3
MIC 436 Med.Virology	3
BIL 511 Biometry	3
MIC 452-3 Projects	2-4
CEN 530 Wastewater Eng	3
CEN 540 Sanit. Eng*	3
CEN 541 Env. Micro*	3

Environmental Engineering Science

CEN 210 Mechanics of Solids	3
CEN 330 Fluid Mechanics	3
CEN 340 Intro.Envir.Engin.	3
CEN 430 Applied Hydraulics	3
CEN 440 Design of Water Quality Control Systems	3
MIC Microbiology	4
<u>Electives</u>	
CEN 530 Water and Wastewater Engineering	3
CEN 531 Engin. Hydrology	3
CEN 540 Sanitary Engin Chem	3
CEN 541 Public Health and Env.Micro.	3
CEN 542 Modeling Environmental Processes	3

BACHELOR OF ARTS**DISTRIBUTIONAL REQUIREMENT**

English composition	6	
Language	9	
Humanities	15	
Social Science	15	
Mathematics	6	51 cr.

SCIENCE CORE

Biology 103	3	
Chemistry	6	
Computer Prog	3	
Statistics	3	
Advan. Writing	3	18 cr.

ENVIRONMENTAL SCIENCE CORE

Introduction	MSC 117	2 cr.	
Internship	New	4 cr.	
Regulation/Risk Management	New	3 cr	
Environmental Science	New	3 cr	12 cr.

Bachelor of Arts Program in Public Policy

POL 321 Public Policy and Administration	3
POL 450 Management and Soc.	3
POL 524 Budget and Fin. Management and Administration	3
MAF 502 Eco. of Nat. Resources	3

Electives

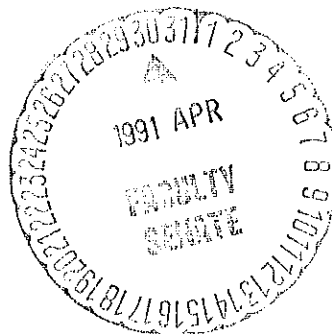
MSC 313 Coastal Law	3
MSC 314 Ocean Law	3
MAF 521 Envir. Law	3
EPI 541 Int. Asp. of Env. Health*	3
GEG 404 Eco. GEG	3
GEG 451 Cartography	3
GEG 452 Air Photo Interp	3
GEG 453 Geo Processing	3
INS -- New Courses in Process	

Environmental Systems Management

Students in this track would include the science core and the es core subjects, but would fulfill distribution requirements of the School of Business. Their Management Science major is extant with 18 credits in MAS courses and 18 credits in CIS.

Marine Environmental Systems (Marine Affairs)

Students in this track would fulfill A&S distribution requirements, science core and ES core in addition to their current 24 credit major in Marine Affairs



Edward T. Foote II
President

M E M O R A N D U M

April 26, 1991

TO: George C. Alexandrakis

FROM: Edward T. Foote II

377

I agree absolutely with Luis's views about the Environmental Sciences Program, as expressed in his April 24 memorandum to you. If you or any other senators have any problem with his proposal, please let me know immediately.

I would like the opportunity to address the entire Faculty Senate on this and some of the larger issues it reflects.

Thanks.

ETF:LLS

cc: Luis Glaser

SENATE COUNCIL MEETING

May 6, 1991

- PRESENT:** Professors Alexandrakis, Allegro, Awad, Boardman, Brass, Clasby, DeSantis, Eckstein, Heuson, Lorton, Seiler, Swan, Victoria, Warren and Whelan.
- ABSENT:** Professor Baden.
- GUESTS:** President Foote, Provost Glaser, Dean Wilson and Professors Bleck and Farmer.

Call to Order

The first meeting of the 1991-92 Senate Council was called to order at 2:05 p.m. by Chairman Alexandrakis. The minutes of April 1 were approved as submitted.

Bachelor's Degree in Meteorology

Professor Eckstein, Chairman of the sub-committee to review the proposal for a Bachelor's degree in Meteorology, summarized the proposal and previous discussion for a double-major baccalaureate degree in meteorology and applied mathematics for undergraduate students. In addition, there would be a possibility of a minor in Communication for students interested in working for the National Weather Service. It has been suggested that students be allowed the option of a single major that would include such courses as chemistry. Professor Rainer Bleck, Chairman of the Department of Meteorology and Physical Oceanography, informed the Council that the faculty in his department, who are heavily involved in research and supervision of graduate students, wished to offer their expertise to undergraduates. He mentioned that there is a great demand for Bachelor's degree candidates in the vast network of people needed to forecast weather worldwide. He indicated that an additional person would need to be hired. A discussion followed on the arrangement of revenues derived from the program. It was *moved*, and seconded, to refer the proposal back to the review committee for a written report, including any understandings which have been made. The *motion carried*.

Program in Environmental Science

Professor Awad, Chairman of the sub-committee to review the proposal for the Program in Environmental Science, summarized the proposal and his committee's discussion. He informed the Council that the following colleges and schools would be involved in the program: Arts and Sciences, Engineering, Medicine, Business and RSMAS. He indicated

that issues of budget, governance, and risk management courses were still to be resolved before the program is approved and implemented. It was *moved*, and seconded, to refer the matter to a subsequent Council meeting pending a statement resolving the issues outlined by Professor Awad. Professor Clasby noted, for the record, his opposition to administrative supplements. The *motion carried*.

President's Comments

President Foote announced that Mr. Cyrus Jollivette, Vice President for University Relations and Secretary of the University, will be leaving the University at the end of July to join a Washington firm specializing in lobbying for higher education.

The Silver Club

The President asked the Council for advice in preparation for his meeting with representatives from the Silver Club. Council members noted that the issues raised by the Silver Club, and communicated to the Board of Trustees, are similar to those brought forward by the Senate over the years.

Calendar for 1991-1992

Professor Alexandrakis announced that the Fall and Spring meetings with the President will have to be added to the approved calendar. Several suggestions were proposed for improvements in handling the agenda business. It was *moved*, and seconded to approve the proposed calendar. The *motion carried*.

Matters from the Floor

There was discussion on how the agenda items could be debated in a more efficient manner. It was *moved*, and seconded, that the Council will set a limited time for debate for each agenda item based upon the nature of the issue. At the expiration of the set time, the Chair will call the question unless there is a majority vote of the Senate present to continue the discussion. The Chairman will propose the time limit for an extension of the discussion. The *motion carried with two opposed and one abstention*. It was *moved*, and seconded, that the Chairman appoint a committee to review the promotion and tenure instructions sent by the Provost to the Deans and compare them to established legislation, identify any points of incongruence and report back to the Council. The *motion carried*. Professor Swan was appointed to chair the review committee along with Professors DeSantis and Warren.

SENATE COUNCIL MEETING

June 10, 1991

PRESENT: Professors Alexandrakis, Allegro, Awad, Baden, Boardman, Brass, Clasby, DeSantis, Eckstein, Heuson, Lorton, Seiler, Swan, Warren and Whelan.

ABSENT: Professor Victoria.

GUESTS: Vice Provost Sugrue, Dean Wilson, Professors Churchill, Farmer, Green, Knoblock and O'Brien.

Call to Order

The meeting was called to order at 3:30 p.m. by the Chairman. The minutes of April 22 and May 6 were approved as submitted.

Program in Environmental Studies

Professor Alexandrakis indicated that the faculty of RSMAS had not reviewed the new draft of the proposal for the program in Environmental Studies and asked that final action be deferred pending the RSMAS recommendations. Professor Awad, Chairman of the Council's sub-committee, summarized the committee's report. Discussion followed on the responsibilities and authority of the director of the program. According to Professor Awad, the RSMAS faculty has requested discussion on the sharing of tuition revenue between RSMAS and Arts and Sciences. It was *moved*, and seconded, to record that the sense of the Senate Council is that the appropriate committee reconsider the description of the Steering Committee and rephrase the wording to make it clear that the committee is a policy-making committee. The *motion carried*. It was suggested that the Director's supplement should be defined and published and not a negotiated figure. It was noted that the proposal lists a part-time/overtime rate which is at variance with the Senate's own policy on the matter. Professor Clasby requested that two statements be included in the proposal: 1) that if full-time faculty teach in this program on an overload basis, they will be compensated at the summer school rate; and 2) that some percentage of salary will be determined as the additional incremental pay for the faculty member directing the program. Dean Wilson explained the way students were identified in existing majors who might be inclined to move into the new program.

Professor Knoblock reminded the Council that a letter of financial commitment from the Provost is required for the approval of any new program. The matter of the Deans having veto power on the Steering Committee was also discussed. Professor Knoblock requested that the newly approved majors be listed by degrees, by schools and by existing major with the tracks to be offered.

Bachelor's Degree in Meteorology - (First Reading)

Professor Alexandrakis introduced Professors Enda O'Brien and Dean Churchill from the Department of Meteorology and Physical Oceanography at RSMAS to answer any queries on the proposed Bachelor's degree in Meteorology. Professor Eckstein, Chairman of the review sub-committee, presented the committee's report. He indicated that the financial issue regarding salaries for participating faculty has been handled by the Provost and Deans. Dr. Farmer has indicated that she will handle day-to-day issues from the existing budget for the office of Marine Science. Capital equipment will be funded at a later date from proposals written to the National Science Foundation for matching funds from the University. The sub-committee has recommended that a single major in Meteorology, without meeting the full Mathematics major requirements, be offered in the future. Professor Eckstein stressed the need for transportation to RSMAS. It was *moved*, and seconded, to accept this discussion as the first reading of the proposal. The *motion carried*. It was *moved*, and seconded, to waive the second reading. The *motion carried with two opposed*.

Committee on Committees

Professor Whelan, Senate Chair-elect, presented the recommendations of the Committee on Committees for committee appointments for 1991-1992. Each committee was reviewed by the Council and some suggestions were made for strengthening or balancing the representation on some of the committees. The Committee was granted the authority to refine several committees. It was suggested that the Committee on Women and Minority Rights investigate the recent history and associated issues of paid maternity leave for female faculty members.

Matters from the Floor

Professor Brass brought to the Council the matter of a change in tuition remission benefits. It indicates a violation of the Faculty Charter by the administration. He said it is also a misrepresentation of the discussion between the administration and Senate and Budget

SENATE COUNCIL MEETING

June 19, 1991

- PRESENT: Professors Alexandrakis, Awad, Baden, Boardman, Brass, Clasby, DeSantis, Heuson, Lorton, Victoria, Warren, and Whelan.
- ABSENT: Professors Allegro, Eckstein, Seiler, and Swan.
- GUESTS: Vice-Provost Sugrue, Dean David Wilson, Professors Linda Farmer, and Chris Harrison.

Call to Order

The Chairman called the meeting to order at 2:45 p.m. The minutes of June 10 were approved after changing the last part of Matters from the Floor to read: He informed the Council that the Administration's response did not adequately address the moral and equity issues underlying this matter.

Program in Environmental Science

The Chairman introduced Dean Wilson from the College of Arts and Sciences, Professor Chris Harrison from RSMAS and Professor Linda Farmer from Biology. The Chairman reminded the Council that during the previous meeting they had asked for a written budget commitment from the Provost to the program of Environmental Science and for a list of the programs involved. After distributing the list of the programs, Dean Wilson explained that there are nine tracks that are currently listed as options for students interested in Environmental Sciences if this program is approved. Six of those tracks are in already existing majors; therefore, they do not need the approval of the Faculty Senate. However, there is a new major that does need Senate approval, the Environmental Science major, a Bachelor of Science Degree offered through the College of Arts and Sciences with the participation of three other schools, Medicine, RSMAS, and Engineering. A Steering Committee would oversee the program and will serve as a coordinating committee for all the programs offered by the different schools; it would also oversee the new major. At the beginning only Environmental Science students will be counted as part of the program. Discussion followed on the role and responsibilities of the Steering Committee and the director described in the section of the proposal titled "Structure of the Program". It was *moved* and seconded to change the second part of that section to indicate the responsibilities of the Committees for all matters relating to the program's educational, research, and administrative affairs in accordance with Section X.10.1 of the Faculty Charter. The Steering Committee will be responsible for the overall development of the program, curricular coordination, student advising, recruitment of students, extramural funding, and

individual members will facilitate interaction with home departments. The two last sentences of the paragraph were deleted. The *motion carried*. The discussion moved to the first part of the paragraph. Three issues were included; the first was the concurrence by the members of the Steering Committee, the second, the concurrence by the deans, and the third, the membership of that body. It was agreed that the word concurrence would weaken collegiality and the system of consultation and recommendation at the University. It was *moved* and seconded to change the second paragraph to read: In consultation with the Steering Committee and the other deans, the Dean of the College of Arts and Sciences will appoint a director. The *motion carried with eight votes in favor and one opposed*. It was *moved* and seconded to recommend a minimum of two representatives from RSMAS. The *motion* was amended to initially appoint two members from RSMAS to the Steering Committee. The *motion as amended carried*. Before the discussion on the program ended, Vice-Provost Sugrue distributed to the Council the Provost's budget commitment. Discussion followed on the Director's negotiated supplement and release cost, and allocation for small supplies and publications. Dean Wilson explained that the budget commitment will stand so long as enrollment is justified. It was *moved* and seconded to approve the program as modified. The *motion carried*. It was *moved* and seconded to waive the second reading. The *motion carried*. Professor Clasby re-stated his position to object to the fact that no limit for the Director's supplement was specified.

Tuition Remission

Professor Whelan, Chairman of the Senate Budget Committee, summarized the position of the Council in reference to the change in tuition remission benefits notified in the statement distributed with the end-of-May paychecks. He stated that the change was a misrepresentation of the discussions held by the Administration and the Senate Budget Committee. He reminded the Council that in the previous meeting they passed a motion to go on record, via a letter from the Chairman of the Faculty Senate to the Provost, expressing its view that the recent statement on tuition remission completely contravenes *Faculty Manual* policies on this matter and that it must be withdrawn. The faculty should also be notified immediately. Professor Whelan informed the Council that the Provost had agreed to withdraw the statement. After stating that Mr. Lieberman has been informed of the Provost's agreement to withdraw the statement, he read a draft of the letter that Professor Alexandrakis will send to the Provost. Professor Clasby reminded the Council about his petition to discuss the issue of tuition remission and scholarships for dependents of employees at the University.



Executive Vice President and Provost

MEMORANDUM

June 19, 1991

TO: Senate Council

FROM: Paul K. Sugrue
Senior Vice Provost

SUBJECT: Environmental Sciences Program

The Provost has agreed to the following budgetary commitments for the first four years of the proposed Environmental Sciences Programs:

Year 0 (1991-92)

Director's supplement/Release cost	(negotiated with Dean)
Small supplies, publications, etc.	\$ 2,000

Year 1* (1992-93)

Director's supplement/Release cost	(negotiated with Dean)
PT/OT Policy/Risk (@ 28.5% CFB)	2,000
PT/OT GIS (@ 28.5% CFB)	2,000
CWS	500
Fringe Benefits	1,140

Publication/Mail	2,500
Phone/Fax	1,500
Office Supplies	2,000
Computer/Software	4,500
Van (1/3)	<u>6,000</u>
Total	22,140

+ Director's cost, and extra secretarial assistance if warranted by enrollment

*Remuneration for RSMAS and medicine faculty teaching in new majors is not included. An appropriate fraction of such salary will be paid, as negotiated among provost and

Senate Council
 June 19, 1991
 Page Two

deans involved. At RSMAS, and perhaps medicine, if the faculty member is unfunded, no spendable dollars will be provided, but a credit towards deficit reduction will be given.

The budget for years two and three is tentative and will be adjusted if enrollment projections are not met.

Year 2 (1993-94)**

Director	(negotiated)	
Secretary (@ 29% CFB)	16,000	
Line Policy/Risk(POL) (@ 28.5% CFB)	17,500	(1/2 line, if viewed as necessary)
PT/OT Cartography (@ 28.5% CFB)	4,000	
CWS	750	
Fringe	10,768	
Pubs	1,500	
Phone/Office	3,000	
Computers for lab	9,000	
Van (1/3)	6,000	
Environmental Lab Set-up	50,000	(\$10,000 from U budget; remainder from gifts and grants)
Transportation of students	3,000	
Computer time	<u>3,000</u>	
Total	124,518	+ Director's cost

Year 3 (1994-95)**

Director	(negotiated)	
Secretary (@ 29% CFB)	16,900	
CWS	1,500	
Line Risk/Policy (@ 28.5% CFB)	18,550	(1/2 line, if viewed as necessary)
Line Cartog (GEG) (@ 28.5% CFB)	17,500	(1/2 line, if viewed as necessary)
Coordinator (@ 28.5% CFB)	24,000	
Grad TA	12,000	
Fringe	22,015	
B Budget	14,500	
Van	6,000	
Lab Equipment and Supplies	15,000	
Transportation	<u>3,000</u>	
Total	150,965	+ Director's cost

Senate Council
June 19, 1991
Page Three

**Possible costs of remuneration of RSMAS and Medicine faculty is not included (see above).

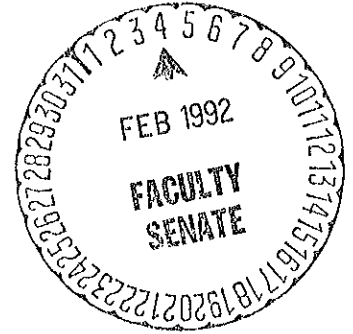
When estimating the enrollment increase due to "incremental" students, as opposed to cross-overs, the 1990-91 level of marine science majors will be adjusted for the overall enrollment change. Total enrollment in marine science plus environmental science will then be compared with this adjusted base to determine incremental students.

PKS:nh

J.E. Mue



COLLEGE OF ARTS AND SCIENCES



MEMORANDUM

TO: Mrs. Barbara Hoadley
Faculty Senate

FROM: Charles Mallery, Associate Dean
College of Arts & Sciences

RE: Environmental Science

DATE: February 4, 1992

Persuant to the Faculty Senate approved proposal to create the program in Environmental Science (ESC) I am requesting that the aforementioned program be assigned a department code of ESC and be communicated to Academic Services (fax - 5429) in order to establish the appropriate code.

Your expedience in this matter would be greatly appreciated as we are dealing with a schedule deadline.

Chairman: Dr. George C. Alexandrakis, Department of Physics, 443 Unger Bldg.,
Coral Gables, FL 33124, Phone: 305-284-2323, Fax: 305-284-4222

Chairman-Elect: Dr. William J. Whelan, Department of Biochemistry & Molecular Biology,
P.O. Box 016129 (R629), Room 317 Gautier Building, Miami, FL 33101,
Phone: 305-547-6267, Fax: 305-324-5665

Vice-Chairman: Dr. Garrett W. Brass, Department of Marine Geology, N352 Grosvnor Bldg.,
Key Biscayne, FL 33149, Phone: 305-361-4690, Fax: 305-361-4632

Senate Secretary: Ms Barbara Hoadley, Faculty Senate Office, 325 Ashe Bldg. (Code 4634),
Coral Gables, FL 33124, Phone: 305-284-3721, Fax: 305-284-4686

June 24, 1991

Dr. Luis Glaser
Exec. Vice-Pres. and Provost
Department of Biochemistry
University of Miami
240 Ashe Bldg.
Coral Gables, FL

Dear Luis:

I refer to the meeting that George Alexandrakis, Garrett Brass and I had with you and Paul Sugrue on June 13, specifically, our discussion of the new program on environmental sciences and the difficulty that the Senate and Senate Council had in dealing with it because it came to them for action so late. We recommended that new academic new programs requiring Senate action in order to be implemented the following year should be submitted to the Senate before March 1 in the prior year. If we have this amount of lead time, we would feel more comfortable than we did with the environmental sciences program, where the Senate had to delegate the action to the Senate Council, which in turn had to hold special meetings in order to gain approval of the proposal before the summer.

We thought it important to put this recommendation on the record for the future.

Yours sincerely,


W.J. Whelan

WJW/mg

cc: Dr. George C. Alexandrakis
Dr. Garrett W. Brass



MEMORANDUM

To: Members of the Faculty Senate
From: George C. Alexandrakis
Chairman, Faculty Senate
Subject: Program in Environmental Sciences
Date: May 31, 1991

Enclosed please find the complete proposal for Environmental Sciences under consideration by the Faculty Senate. As per agreement, I am sending you the proposal for your review. Please send any comments you may have to the Faculty Senate Office by Friday, June 7, 1991 so that they can be taken into account by the Senate Council on Monday, June 10 when they will meet to consider the matter on your behalf.

Thank you for your consideration.

GCA\ca

Enclosures

Proposed Program in Environmental Science

As Reviewed by the Sub-Committee of the Senate Council

Members: William Awad, Jr. (Chairman)	Medicine
Thomas Clingan	Law
Steven Green	Biology
Paul Wilson	Music

The program in Environmental Science is an interdisciplinary curriculum proposed by the College of Arts and Sciences. Ten tracks have been presented, six of which are fairly well defined. The curriculum intends to meet a growing demand for specialists in Environmental Sciences in both the public and private domains. The program offers majors suitable for individuals seeking terminal technological qualifications as well as for those pursuing a general education in preparation for advanced degrees. Degrees will be granted by three academic units within the University: the College of Arts and Sciences, the College of Engineering, and the School of Business. Two other academic units, the School of Medicine and RSMAS, have tracks in the program. Students in the latter tracks will receive degrees through the College of Arts and Sciences. Both Bachelor of Science and Bachelor of Arts degrees will be offered by the College of Arts and Sciences. The curriculum will fulfill existing general education requirements. It includes a core curriculum extending to all four years of enrollment as well as specialized courses in each track.

The core curriculum starts with a first-year well-established introductory course. In the second year a new general course in environmental sciences is described in some detail. The third-year core course deals with regulation and risk management, a description of which has yet to be presented. The fourth year's core course is an appropriate and defined internship for each of the individual tracks.

The governance of the program is under a committee consisting of faculty members from each of the tracks. Chairing the Committee will be a program director. Budgetary support will be provided through Arts and Sciences by the Provost's office, with any special salary agreements to be determined in consultation with the deans of the participating academic units.

Specific Comments

The Senate Council has asked that specific aspects of the proposal be addressed. A meeting was held with the Provost, Dean Wilson, and Dean Rosendahl, some members of the steering committee, and the members of this sub-committee. Discussions centered on the following:

1. The issue of the process of appointment of the director and the governance of the program was discussed in detail. The steering committee will be responsible for all aspects of the program. After consultation with and concurrence of the steering committee and other deans, the Dean of the College of Arts and Sciences will appoint the director. The director will report to the Dean of the College of Arts and

Sciences. A discussion ensued as to whether the director should report to the steering committee also. The deans and the Provost felt strongly that this was inappropriate for reasons which were not necessarily clear. Language has been incorporated into the proposal emphasizing the responsibilities of the steering committee with the implication that major decisions will be made in a collegial fashion.

2. The curriculum has been fairly well defined for six of the tracks with the provision of appropriate lists of courses. One consideration was the participation of the School of Law in the third-year core course (Regulation/Risk Management). Assurances were provided by members of the School of Law and by the Provost that there should be no problem of such a participation. It will be left to the future as to whether the School of Law will have a representative on the steering committee.
3. Several budgetary issues were discussed. They included:
 - a. The amount of salary supplement for the director. This was resolved by realizing that it will depend upon the time contribution by the director. The supplement will be appropriate for the effort spent by the director and will make up any relinquishment of other salary-based commitments upon assumption of the directorship.
 - b. It was accepted by the Provost that the teaching contributions of each faculty member will be recognized by an appropriate salary credit to the academic unit of the participant. This is an important measure since it will provide some though not absolute assurances that faculty participation will represent the best qualified and most interested individuals who will be recognized for their contributions.
 - c. Other budgetary issues included a discussion of the needs of the director's office during the zero year of operation (1990-1991). The director will be responsible for developing grants, implementing a recruitment procedure, and preparing the appropriate literature describing the program, in addition to many other duties associated with curriculum development. Assurances were provided by the Provost and Dean Wilson that sufficient staff support will come from individuals who are presently underutilized in a few offices.

The members of the sub-committee were very concerned that the program office could be significantly underfunded. The director is expected to communicate with high schools, to plan the program of recruitment for new students and most importantly to prepare funding proposals to foundations and public agencies for support of what could be a very attractive focus for potential benefactors.

General Summary

This program is focused on a rapidly growing interest in American society and should attract many students. The University is well qualified through its schools and various academic interests to provide a strong curriculum in the areas identified in the proposal. A successful program will improve the quality of the student body in addition to addressing the financial needs of the institution. However, though a sound educational experience will be provided the program is focused primarily on vocational goals. The curriculum can attract good students but probably not the very best individuals academically. As such it will help solve pressing financial issues in several academic units, with a digression from the University's goal of becoming one of the few best educational institutions in the country.

PROPOSED PROGRAM IN ENVIRONMENTAL SCIENCE

May 16, 1991

Committee:	Ron Hofstetter	Biology
	Jonathan West	Political Science
	Lora Fleming	Epidemiology and Public Health
	Tom Briggie	Epidemiology and Public Health
	Peter Swart	Marine Geology and Geophysics
	Frank Millero	Marine and Atmos. Chemistry
	Linda Farmer	Marine Science Program

INTRODUCTION

The multidisciplinary field of environmental science is one of the fastest growing areas of employment today. Workforce 2000, a publication of the Hudson Institute predicts a 70% increase in the positions in natural and environmental sciences by the year 2000. Florida Trends and Forbes also project increasing labor needs in diverse areas of environmental science and management.

A number of universities have recognized the demand for training in ecological and environmental sciences and responded with curricula that include introductory courses for the educated voter, technical majors focused toward the job market, research oriented programs, and interdisciplinary graduate programs.

Our review of external programs included those of Johns Hopkins University, Duke University, the University of Wisconsin, the University of Michigan and the University of Kansas. (Appendix I) All provide interdisciplinary graduate degrees as well as more focused and departmentalized offerings in ecology, toxicology, etc. Some courses are available to undergraduates; Johns Hopkins, Kansas and Stanford offer full majors. Others schools provide areas of concentration within basic science majors or programs in agriculture and forestry or certificate programs. We were most impressed with the University of Kansas' outline, which provides for roughly two years of basic science and core courses and two years of more focused offerings in a variety of tracks leading to a Bachelor of Science degree.

STRUCTURE OF THE PROGRAM

The Committee strongly recommends the establishment of a Program in Environmental Sciences, roughly following the models of the Marine Science and International Studies Programs. Environmental Science is by nature interdisciplinary. Students interested in the field need to be exposed to interests beyond those of present departmental lines. In addition, the most successful undergraduate programs we reviewed are those that provide the student with a home base for advising and extra-curricular activities, as well as academic projects and internships. A program will also serve as forum for faculty interaction and collaboration.

The proposed program will be administered by a Director and a faculty steering committee. With the concurrence of the faculty steering committee and the other deans, the dean of the College of Arts and Sciences will appoint the director. Members of the faculty steering committee will be selected for each of the tracks by the deans and councils of the involved schools. Initially these are Environmental Geology (A&S), Chemistry/Toxicology (A&S), Environmental Health Sciences (Medicine), Environmental Engineering Science (Engineering), Ecosystem Analysis (A&S), Wildland and Wildlife Management (A&S), Marine Environmental Systems (RSMAS), Environmental Systems Analysis (Business), and Environmental Policy (Business). The steering committee will be chaired by the Director. Its members will be responsible for curricular coordination, student advising and will

facilitate interaction between the program and their home departments. This committee and the director will be responsible for the overall development of the program, recruitment of students, and extramural funding. The steering committee is expected to be involved in all major decisions related to the program. In the third year of the program, a coordinator may be added to assist with internship placements and office administration.

CURRICULA

The proposed curricula are designed for those students who wish to pursue careers in areas of environmental science following the completion of Master's level studies. The program does not focus specifically upon the research oriented student, but attempts to provide an interdisciplinary background with analytical and communication skills and practical hands on experience. It is expected that some students will choose to seek employment upon completion of a Bachelors degree, others will choose doctoral studies, but for the majority, the Masters will be the terminal degree.

Our committee proposes curricula in environmental sciences leading to a Bachelor of Arts or to a Bachelor of Science degree. We strongly encourage students to continue in extant interdisciplinary Masters programs, and we hope to work to further develop graduate offerings as the undergraduate program gains support.

For the present, we propose a curriculum that includes distributional requirements, a basic science core and a core in environmental science. Upper division courses are divided into tracks to provide area specialization in environmental geology, chemical toxicology, marine environmental systems, ecosystem analysis, wildlife management, public policy, environmental decision making, environmental engineering science and environmental health sciences.

We originally intended that a single environmental science major would be offered by the program with tracks in the above mentioned areas, however several faculties have expressed the desire to participate in the program but to retain students as departmental rather than environmental science majors i.e. for the track in wildlife management, students will take 8 credits of biology in the science core, 20 credits in the "option" track and a 4 credit internship. The department of Biology has approved this curriculum as acceptable for a biology major. Other "tracks" that have current approval as extant majors include marine environmental systems (Marine Affairs A&S/RSMAS), environmental systems management (Management Science/ Business), and environmental engineering science (CEN/Engineering). Two additional tracks -- environmental geology and environmental policy are being considered for major approval by the department of geological sciences and political science.

The three remaining tracks; environmental health sciences (Microbiology, Civil Engineering and Epidemiology), ecosystem analysis (Biology, Geological Sciences, Geography), and chemical toxicology (Chemistry, Epidemiology, RSMAS) are more interdisciplinary and do not satisfy requirements for any extant major. We propose approval of these curricula as new majors in environmental science per se. In general Bachelor of Arts degree requirements can be completed with 105 credits plus 15 credits of electives, but the Bachelor of Science programs extend from 120-126 credits as proposed.

In summary, students seeking a Bachelor of Arts degree will choose an extant major in Political Science with a specialization in Environmental Policy or an extant major in Marine Affairs; students seeking a Bachelor of Science degree will select a new major in Environmental Science with specialization in Ecosystem Analysis, Chemical Toxicology; or Environmental Health Sciences; or a major in Biology with a specialization in Wildlife and Wildland Management (extant), Geology with a specialization in Environmental Geology (extant), Engineering Science with a specialization in Environmental Engineering Science (extant), or Management Science with a specialization in Environmental Systems Management (extant).

The curricula outlined are proposed as a basis for discussion, not for final approval. New interdisciplinary courses must be developed and approved, some extant courses may be modified. The preliminary response of the faculty has been very enthusiastic, and many more people may wish to share their insights.

IDENTIFIED NEEDS:

1. PERSONNEL:

Faculty Expertise in several key areas is crucial for the initiation of this program:

- Risk management
- Natural resource economics
- Hydrology
- Soil Science
- Cartography/GIS mapping
- Environmental policy/regulation

In addition, the program will also need a full-time director, a coordinator/advisor and release time for appropriate faculty from duties in their home departments.

2. FACILITIES & EQUIPMENT:

To operate effectively as an undergraduate teaching program environmental studies will need a central office with 3-4 faculty areas for advising, a central teaching laboratory, several smaller student lab/prep. areas and a stockroom/equipment storage area.

Equipment needs are critical, expensive, and not available on the Coral Gables campus. Major items include: high-pressure liquid chromatograph (HPLC), gas chromatograph, autoanalyzer, high speed refrigerated centrifuge, -70 freezer, routine lab spectrophotometers, balances, glassware and chemicals. In addition, since the facilities involved are located on four campuses, a van for transportation will be crucial.

Lab computers, software and Vax time will also be required. In addition, communication networks between the different facilities is key. Partial networks have been established, but will need to be specifically upgraded for these purposes.

PROJECTED ENROLLMENTS AND REVENUES

Year 1 Fall 1992	20 New students (incremental)
	<u>30</u> Crossover students
	50
Year 2 Fall 1993	30 New students
	15 Returning incremental students
	<u>40</u> New and returning crossover students
	85
Year 3 Fall 1994	40 New students
	35 Returning incremental students
	<u>40</u> New and returning crossover students
	115

APPROVED BUDGET YEAR 0 (1991-92)

Director's supplement/Replacement cost	(negotiated with Dean)
Small supplies, publications, etc. budget	(negotiated with Dean)

APPROVED BUDGET YEAR 1* (1992-93)

Director's Supplement/Replacement cost	(negotiated by Dean)	
PT/OT Policy/Risk (@ 28.5% CFB)	2,000	
PT/OT GIS (@ 28.5% CFB)	2,000	
CWS	500	
Fringe Benefits	1,140	
Publication/Mail	2,500	
Phone/Fax	1,500	
Office Supplies	2,000	
Computer/Software	4,500	
Van (1/3)	<u>6,000</u>	
Total	22,140	+ Director's cost, and extra secretarial assistance if warranted by enrollment

*Remuneration for RSMAS and medicine faculty teaching in new majors is not included. An appropriate fraction of such salary will be paid, as negotiated among provost and deans involved. At RSMAS, and perhaps medicine, if the faculty member is unfunded, no spendable dollars will be provided, but a credit towards deficit reduction will be given.

The budget for years two and three is tentative and will be adjusted if enrollment projections are not met.

YEAR 2 ** (1993-94)

Director	(Negotiated)	
Secretary (@29% CFB)	16,000	
Line Policy/Risk(POL) (@28.5% CFB)	17,500	(1/2 line, if viewed as necessary)
PT/OT Cartography (@ 28.5% CFB)	4,000	
CWS	750	
Fringe	10,768	
Pubs	1,500	
Phone/Office	3,000	
Computers for lab	9,000	
Van (1/3)	6,000	
Environmental Lab Set-up	50,000	(\$10,000 from U budget; remainder from gifts and grants)
Transportation of students	3,000	
Computer time	<u>3,000</u>	
Total	124,518	+ Director's cost

YEAR 3 ** (1994-95)

Director	(negotiated)	
Secretary (@29% CFB)	16,900	
CWS	1,500	
Line Risk/Policy (@28.5% CFB)	18,550	(1/2 line, if viewed as necessary)
Line Cartog (GEG) (@28.5% CFB)	17,500	(1/2 line, if viewed as necessary)
Coordinator (@28.5% CFB)	24,000	
Grad TA	12,000	
Fringe	22,015	
B Budget	14,500	
Van	6,000	
Lab Equipment & Supplies	15,000	
Transportation	<u>3,000</u>	
	Total	150,965 + Director's cost

**Possible costs of remuneration of RSMAS and Medicine faculty is not included (see above).

When estimating the enrollment increase due to "incremental" students, as opposed to cross-overs, the 1990-91 level of marine science majors will be adjusted for the overall enrollment change. Total enrollment in marine science plus environmental science will then be compared with this adjusted base to determine incremental students.

PROPOSED CURRICULA FOR THE BACHELOR OF SCIENCE

GENERAL DISTRIBUTION

English composition	6 cr	
Language	9	
Humanities	12	
Social Science	12	
Mth 111 and 112	8	
		47 cr

SCIENCE CORE

Bil 111 and 112	8	
Chem 111 and 112	8	
Chm 201,202	8	
Phy 101,102	8	
GSC 150	4	
Statistics	3	
Comp. Prog	3	
		42 cr

ENVIRONMENTAL SCIENCE CORE

Introduction	MSC 117	2	
Internship	New	4	
Regulation\Risk			
Management	New	3	
Environmental	New	3	
Science			12 cr

SPECIALIZATION TRACKS

(*Courses are shared electives in more than one track)

Environmental Geology

(Numbering under revision currently)

Sedimentology	4
Statigraphy	4
World Geology	3
Minerology & Petrology	4
Geochemistry	3
<u>Electives</u>	
Hydrology*	3
Structural Gel	3
Soil Science*	3
Environmental Gel.	3

Environmental Chemistry/Toxicology

CHM 316 Instrumental Analytical Chem.	4
CHM 304 Spectrometric Organic Chem.	4
ES xxx Introduction to Toxicology	4
EPI 541 Integ. Aspects of Env. Health	3
<u>Electives</u>	
CEN 530 Water and Wastewater Engin.*	3
IEN 554 Industrial Toxicology	3
MEN 520 Air Pollution	3
BLR 550 Anal. Tech. in Marine Biol	2
MGG 581 Anal. Methods in Geochem	2
EPI&PH 581 Medical Toxicology	3
EPI Integrated Asp. of Env. Health	3
GSC Soil Science *	3
MSC 330 Marine Pollution	3

Ecosystem Analysis

BIL 330 Ecology	4	
BIL 338 Ecology of S. Florida	3	
MEN 530 Remote Sensing	3	or
GEG 452 Air Photo Interp.	3	
GSC XXX Soil Science*	3	or
GSC XXX Hydrology *	3	

Electives

BIL 326 Plant Taxonomy	4
BIL 538 Wetland Ecology	3
GEG 201 Phy. Geography: Physiography	3
GEG 202 Phy. Geg: Climatology	3
GSC XXX Soil Science*	3
GSC XXX Hydrology *	3
CHM XXX Env. Chem	3

Wildland and Wildlife Management

BIL XXX Populations, Resources and the Environment	3
BIL 211 Genetics	3
BIL 330 Ecology	4
BIL 338 Ecology of S. Florida	3
<u>Electives (One from each section)</u>	
Section A	
BIL 221 Biology of Birds	4
BIL 326 Plant Taxonomy	4
BIL 522 Biology of Insects	4
BIL 525 Herpetology	3
BIL 527 Biology of Fungi	4
BIL 528 Algae	4
BIL 529 Higher Vascular Plants	4

Section B

BIL 241 Animal Behavior	4
BIL 331 Vertebrate Ecology	4
BIL 335 Tropical Field Biology	3
BIL 360 Animal Physiology	3
BIL 365 Endocrinology	3
BIL 536 Plant Ecology	4
BIL 538 Wetland Ecology	3
BIL 541 Ethology & Behav. Ecol.	3
BIL 531 Advanced Field Ecology	5
BIL 562 Ornithology	4

Environmental Health Sciences

MIC 301 Micro.&Immuno.	4
BIL 322 Parasitology	
or MIC 322 Med. Parasit.	4
BCH 401 Biochemistry	3
EPI xxx Applied Epidemiology	4
ES xxx Intro. to Toxicology *	4
EPI 541 Int. Asp. of Env.Health*	3

Electives

EPI&PH Food Hygiene	4
MIC 323 Path.Bact	3
MIC 436 Med.Virology	3
BIL 511 Biometry	3
MIC 452-3 Projects	2-4
CEN 530 Wastewater Eng	3
CEN 540 Sanit. Eng*	3
CEN 541 Env. Micro*	3

Environmental Engineering Science

CEN 210 Mechanics of Solids	3
CEN 330 Fluid Mechanics	3
CEN 340 Intro.Envir.Engin.	3
CEN 430 Applied Hydraulics	3
CEN 440 Design of Water Quality Control Systems	3
MIC Microbiology	4
<u>Electives</u>	
CEN 530 Water and Wastewater Engineering	3
CEN 531 Engin. Hydrology	3
CEN 540 Sanitary Engin Chem	3
CEN 541 Public Health and Env.Micro.	3
CEN 542 Modeling Environmental Processes	3

BACHELOR OF ARTS**DISTRIBUTIONAL REQUIREMENT**

English composition	6	
Language	9	
Humanities	15	
Social Science	15	
Mathematics	6	51 cr.

SCIENCE CORE

Biology 103	3	
Chemistry	6	
Computer Prog	3	
Statistics	3	
Advan. Writing	3	18 cr.

ENVIRONMENTAL SCIENCE CORE

Introduction	MSC 117	2 cr.	
Internship	New	4 cr.	
Regulation/Risk Management	New	3 cr	
Environmental Science	New	3 cr	12 cr.

Bachelor of Arts Program in Public Policy

POL 321 Public Policy and Administration	3
POL 450 Management and Soc.	3
POL 524 Budget and Fin. Management and Administration	3
MAF 502 Eco.of Nat.Resources	3

Electives

MSC 313 Coastal Law	3
MSC 314 Ocean Law	3
MAF 521 Envir. Law	3
EPI 541 Int. Asp. of Env. Health*	3
GEG 404 Eco. GEG	3
GEG 451 Cartography	3
GEG 452 Air Photo Interp	3
GEG 453 Geo Processing	3
INS -- New Courses in Process	

Environmental Systems Management

Students in this track would include the science core and the es core subjects, but would fulfill distribution requirements of the School of Business. Their Management Science major is extant with 18 credits in MAS courses and 18 credits in CIS.

Marine Environmental Systems (Marine Affairs)

Students in this track would fulfill A&S distribution requirements, science core and ES core in addition to their current 24 credit major in Marine Affairs



Executive Vice President and Provost

MEMORANDUM

April 24, 1991

TO: Dr. George Alexandrakis
Chairman, Faculty Senate

FROM: Luis Glaser
Executive Vice President
and Provost

A handwritten signature in cursive script, appearing to read "Luis Glaser".

SUBJECT: Environmental Sciences Program

I believe it is extremely important that this program get underway. It has major implications for us in our ability to attract the kind of students that we all want. Waiting until 1993 will get us into a lot of trouble; we must start now. I do not want to get us into a debate as to how we proceed and what our process is; rather, I would like us to proceed constructively.

Here is my proposal: I would like to request that the Senate approve the proposal that is on the table from Arts and Sciences. I will in turn guarantee you to bring it back in three years for review. If at that time it is either fiscally unsound or academically unsound, we will close the program and stop admissions. If we do this, we will be able to bring the first students on-line by the Fall of 1992, and be able to compete with the Dukes and the Stanfords who already have programs in place. If we do not do this, we will miss a rare opportunity and hurt rather than help ourselves.

One can indeed debate about the fine tuning of programs forever; these debates are usually settled by the faculty teaching the programs as they learn by doing. I hope we can all help the University move forward.

LG:nh

cc: President Edward T. Foote II

P.O. Box 248033
Coral Gables, Florida 33124-4628
(305) 284-3356
Fax: (305) 284-6758

ENVIRONMENTAL SCIENCES PROPOSAL

<u>DEGREE</u>	<u>MAJOR</u>	<u>SCHOOL OFFERING DEGREE</u>	<u>MAJOR NOW EXISTING?</u>	<u>TRACK</u>
B.A.	Political Science	A&S (with Business)	Yes	Environmental Policy
B.A.	Marine Affairs	A&S (with RSMAS)	Yes	Marine Environmental Systems
B.S.	Environmental Science*	A&S (with Med/RSMAS/Engineering)	No	Ecosystem Analysis (Biology/Geology/Geog.) Chemical Toxicology (Chemistry/Med/RSMAS) Env. Health Sciences (Med/Engineering)
B.S.	Biology	A&S	Yes	Wildlife & Wildlands Mgt.
B.S.	Geology	A&S	Yes	Environmental Geology
B.S.E.S.	Engineering Science	Engineering	Yes	Environmental Engineering Science
B.B.A.	Management Science	Business	Yes	Environmental Systems Mgmt.

*This is the only program requiring Senate approval.

The proposed program will be administered by a Director and a faculty steering committee. With the concurrence of the faculty steering committee and the other deans, the dean of the College of Arts and Sciences will appoint the director. Members of the faculty steering committee will be selected for each of the tracks by the deans and councils of the involved schools. Initially these are Environmental Geology (A&S), Chemistry/Toxicology (A&S), Environmental Health Sciences (Medicine), Environmental Engineering Science (Engineering), Ecosystem Analysis (A&S), Wildland and Wildlife Management (A&S), Marine Environmental Systems (RSMAS), Environmental Systems Analysis (Business), and Environmental Policy (Business). The steering committee will be chaired by the Director. The Director is responsible to the dean of the College of Arts and Sciences and to the Steering Committee for all matters relating to the program's educational, research, and administrative affairs in accordance with section X.10.1 of the Faculty Charter. The members of the Steering Committee will be responsible for curricular coordination, student advising and will facilitate interaction between the program and their home departments. This committee and the director will be responsible for the overall development of the program, recruitment of students, and extramural funding. The steering committee is expected to be involved in all major decisions related to the program. In the third year of the program, a coordinator may be added to assist with internship placements and office administration.