

University of Hawaii
ENVIRONMENTAL CENTER

PROGRAM REVIEW

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INTRODUCTION

The Environmental Center was established by action of the Board of Regents in November 1970 in response to a mandate in Act 341 of the 1970 Legislature (Hawaii Revised Statutes Chapter 343. See Appendix A).

The purposes and plans for the Center's development were sketched out in a memorandum to the University President (Establishment of the University of Hawaii Environmental Center: SR:0001, 18 September 1970. See Appendix B). In that memorandum, the Director-to-be recognized the novelty of the plans and recommended review of the Center's activities after 2 years of operation. The development of the Center's programs has proceeded under the guidance of a Policy Committee appointed initially by the President, later by the Manoa Chancellor, and most recently by the Director of Research. The review for which this document is prepared will, however, be the first formal review of these programs.

OBJECTIVES

The underlying philosophy, general aims, and specific goals of the Center have been discussed in "Planning for the Early Eighties: Academic Plan-- Environmental Center" (28 November 1977. See Appendix C). Only a brief summary seems necessary here.

The aims of the Center relate to the functions identified for the Center in its enabling legislation:

The functions of the Center shall be to stimulate, expand, and coordinate education, research, and service efforts of the University related to ecological relationships, natural resources, and environmental quality, with special relation to human needs and social institutions, particularly with regard to the State.

In its educational functions, the aim is to increase the general environmental understanding of students who will make decisions affecting the environment as: i) individuals, ii) officials or members of the staffs of governmental or private organizations, or iii) members of the general electorate.

In its research functions the aim is to increase the scope of and provide focus to environmental research and to improve the reliability of environmental research results.

In its service functions the aim is to make direct, objective contributions to environmental decision making.

ORGANIZATION

The Environmental Center is a Manoa-based system-wide unit of the University. Its Director was responsible originally to the Vice President for Academic Affairs and later to the Manoa Vice-Chancellor, and is now responsible to the Director of Research (See organization chart, Appendix D).

As provided in its legislative charter, the Center's membership is "comprised of those members of the University community actively concerned with environmental problems." No attempt is made to define this membership precisely other than to keep track of those who contribute to Center activities.

The staff of the Center is very small; consisting of the Director (full time), an Assistant Director (half time), an Associate Specialist (half time), a Secretary (full time), for a total position count of 3, and a few student employees.

The Policy Committee has a major role in determining Center policies. It is comprised of 20 members appointed for 3-year staggered terms by the Director of Research from among the departments, colleges, and campuses of the University and the undergraduate and graduate student organizations plus, ex officio the Director of the State Office of Environmental Quality Control. This Committee, which elects its own chairman, has a number of subcommittees concerned with various aspects of the Center's program.

PHYSICAL AND FINANCIAL RESOURCES

Space

The Environmental Center initially occupied part of a temporary building on Maile Way (Maile 10) and was later assigned the adjacent building (Maile 9) to accommodate the Hawaii Environmental Simulation Laboratory (HESL) a major associated enterprise supported primarily by extramural grants. Since those buildings were demolished in late 1976, the Center has occupied space on the third floor of Crawford Hall (Rooms 315 A-E and 317-327A). Within this space, the Center accommodates not only its own activities but geographic-information-system activities initiated by HESL and continuing with various extramural grants, and the headquarters of the Environmental Studies and associated programs.

Finances

Regular budget

During the first six years of its existence, the basic funding of the Center was provided through annual contracts with the State Office of Environmental Quality Control from legislative appropriations for this purpose. At the recommendation of the Center and OEQC, the Center's basic support since 1 July 1977 has been provided from the legislative appropriation to the University. Allocations to the Center from the appropriation have ranged from \$73,000 in 1970-71 to \$91,326 in 1977-78. Budget breakdowns are shown in Appendix E.

Extramural and special support

In cooperation with faculty in other units, the Center has been instrumental in obtaining extramural or other special funding for a number of projects, only a few of which have been administered by the Center itself. The largest was the Hawaii Environmental Simulation Laboratory which, in the period from 1971 to 1976 received over \$1 million in grants and contracts, primarily grants from the Ford Foundation and the National Science Foundation. HESL was not administered by the Center, however, until the period of its external support was ending.

The Environmental Studies program, which is directed by the Assistant Director of the Center, has been supported in part by Center funds and in part

through contribution of services from other units and has received a special allocation of \$7,000 from the College of Arts and Sciences in 1977-78.

Extramural funds provided by grant or contract for projects administered by the Center total \$97,405. These are listed in Appendix J.

It will be noted that the ratio between extramural support for special projects and continuing support for the Environmental Center falls far short of the ratios in the case of most University research units (unless the HESL support is considered as extramural support to the Center). The Center was, however, established primarily to provide services pertinent to the State, and solicitation of extramural support is regarded as incidental to this purpose.

COMMENTS ON PROGRAM IMPLEMENTATION AND EVALUATION

The implementation and evaluation of the Environmental Center's program are best discussed in terms of its three primary functions, those related to environmental education, environmental research, and environmental services. The general aims and specific goals of the Center in performing each of these functions are discussed in Appendix A, together with brief descriptions of achievements to date in each. The following discussions in part merely summarize and in part expand upon the presentation in that Appendix.

Since a major role of the Center is coordination, it must be recognized that in all of its functions the Center is dependent upon the cooperation of other units in the University. In the case of its service function, the dependence is spread so broadly that no particular attention to relationships with selected units is warranted. In the exercise of both its educational and research functions, however, the Center has been intimately associated with semi-independent endeavors, respectively those of the Environmental Studies program and of the Hawaii Environmental Simulation Laboratory. This review covers the development of those endeavors, but not as thoroughly as either may deserve.

An internal evaluation of the achievements of the Center in each of its functions is presented following the discussion of each. The balance among them is, however, addressed in a subsequent overall evaluation.

ENVIRONMENTAL EDUCATION

Initial efforts

One of the first actions taken by the Environmental Center was to publish a directory of Environmental Concerns at the University of Hawaii listing faculty with environmental courses, competence, and curricular with significant environmental content. This directory, with subsequent revisions and supplements, was used by the Center staff in advising students interested in emphasizing environmental matters in their education.

Environmental Studies Program

In the Fall of 1975, the Center took advantage of the interests in environmental education of a new assistant Director to expand greatly the efforts of the Center toward increasing the environmental education opportunities provided by the University, particularly at Manoa. As a result of these efforts new courses have been developed, an Environmental Studies option has been formalized, an environmental forum series has been established, plans have been developed for an Environmental Studies major and an Environmental Studies certificate program, two new graduate level environmental concentrations have been developed, a Pacific environmental education conference is being planned, and several supporting services have been initiated. These efforts are identified with an Environmental Studies Program which has been recognized officially in the College of Arts and Sciences, but which includes functions in other colleges and campuses of the University.

The new courses are offered by individual departments or in the Inter-disciplinary Studies of the College of Arts and Sciences (IS), the Environmental Studies option has been provided in the Liberal Studies program of that College, the new graduate level concentrations will be provided in the Political Science Department of that College, and the Educational Foundations Department of the College of Education.

The Environmental Studies Program, was, however, initiated by and is headed by the Assistant Director of the Environmental Center, which has made available to the program not only his half-time position provided in the regular budget, but at times an extra quarter-time supported by special project funds. The Center has also until recently provided the Program with secretarial services

and a half-time graduate assistant. These services are now provided through a \$7,000 allocation from the College of Arts and Sciences. The Program is also supported by the Educational Foundations Department and the General Sciences Departments through allocations of third-time and quarter-time services of faculty members, respectively and by an extramural grant of \$3,000.

The development of undergraduate environmental programs has been stimulated by the passage of two resolutions calling for formalization for each program passed by the 1977 Legislature, SR 264 and HR 360.

Undergraduate environmental courses and curricula at UHM

Liberal Studies Major in Environmental Studies

The Liberal Studies major in Environmental Studies (EVS/LS) was initiated in the Spring of 1976 and formalized in September 1977. It takes advantage of the opportunities in the Liberal Studies program in which a student can formulate individually a program leading to a B.A. degree. The direct clientele of the EVS/LS program is obvious--students who wish in their undergraduate education not to be bound to one of the traditional disciplines but to put together a program involving a combination of breadth and emphasis that will provide them with some competence in facing environmental problems.

The program is described in the UHM catalog as follows:

Environmental Studies

Interdisciplinary work on ecological questions, including public policy formulation, environmental design, and landuse planning can comprise a Liberal Studies major concentration in Environmental Studies. With a foundation of courses in general science, geography, Pacific urban studies and planning, and American studies, students may concentrate on either the social environment or the natural environment.

In addition to setting up the curriculum of the EVS/LS students, the Environmental Studies staff provides student counseling, student project direction, and graduate school and employment advising. The students use the environmental resource center facilities of the Environmental Center. The head of the EVS program and the director of the Liberal Studies program are co-signers of each student's proposal.

In its first year (1976-77) there were 15 "majors" in the EVS/LS program, and in the current year there are 22 with 8 more in the process of preparing their proposal. To date 24 students have graduated from the program, 5 to 8 per semester.

Most of the EVS/LS students have undertaken to work on one or more projects as part of their direct project or "environmental practicum" experience. These projects have dealt with current environmental issues, such as:

- i) "Bottle-bill" legislation proposed in Hawaii
- ii) Super-sonic transport service to Hawaii
- iii) Steady-state economy (a movie and policy analysis)
- iv) "Kaneohe Bay revisited" (a study of Kaneohe Bay pollution)
- v) Projects on "intermediate technology" and "soft-energy" alternatives
- vi) Growth alternatives for Hawaii

Course development

The development of needed environmental courses has been one of the major undertakings of the Environmental Studies Program. While in the past the program staff have been able to persuade faculty and departments to establish about 15 new courses without special program funding, with its present budget the program is to provide 2 or 3 courses a semester with its own funds (see Appendix F). Courses that will be partially or totally supported by the Program in the Spring Semester of 1978 are: an introductory course; I.S. 210, Introduction to Environmental Issues; PolSc 325F, International Environmental Politics; and PolSc 346, Health and Environment.

The new courses will serve not only the present EVS/LS program but additional undergraduate programs whose development is discussed below.

Further undergraduate program planning

Although the establishment of the present EVS/LS program meets the needs of many environmentally concerned undergraduate students, there are many students who wish to obtain a bachelors degree specifically identified as environmental rather than liberal studies or to obtain a bachelors degree in one of the traditional disciplines but to use select among elective courses those that will provide a broad environmental base around that discipline. To meet these additional needs and to further the response to the two legislative resolutions

referred to earlier, two programs have been planned by the EVS staff and proposed to the Program and Curriculum Committee of the College of Arts and Sciences.

The first, a new EVS major program leading to a B.A. in Environmental Studies, would have replaced the present EVS/LS program. The second is a program proposed to lead to a Certificate in Environmental Studies associated with any of the bachelor's degrees offered by the University. Both programs were considered in October and November 1977 by the Program and Curriculum Committee which disapproved the proposed EVS major program but encouraged further development of the Certificate program, suggesting some revisions. The proposal, without the revisions to be made is attached as Appendix G.

Supporting services

Students in the Environmental Studies Program use the environmental resources of the Environmental Center. In addition, the program maintains a placement library for environmentally related occupations and catalogs of graduate schools with environmentally related programs.

The Program publishes a semi-annual Environmental Studies newsletter covering its various activities which is distributed to some 300 students, faculty, and other friends of the program.

New graduate environmental programs

The Environmental Studies staff has developed, in cooperation with the concerned departments, two new environmental concentrations in Master's degree programs. One of these now has been established by the Political Science Department--a program leading to an M.A. in Political Science with a concentration in Political Ecology (see Appendix H). The other, being considered by the College of Education, would lead to an M.Ed. in Educational Foundations with a concentration in Environmental Education. From three to six students are currently intending to enroll in each of these programs, and considerable expansions in enrollment are anticipated when the programs mature in 1978-79.

Environmental Forum

The Environmental Forum is a series of weekly seminars initiated by the Environmental Studies program in the Spring of 1976. The seminars, scheduled

Wednesdays from 12:30 to 2:00 p.m., are open to the public as well as the University community and have been attended regularly by between 25 to 80 persons. The principal speakers have been selected from the University and external community. About half the seminars have dealt with environmental topics with particular relevance to Hawaii, the others have dealt with national and global issues concerning the natural and social environment.

Each seminar is now taped, with a Ka Leo reporter present, and a few have received Channel 9 TV coverage.

Community College environmental curriculum development

In cooperation with four UH Community colleges (HCC, KCC, WCC and LCC) the Environmental Studies staff is preparing a student-advising program and environmental course list that will assist students in the Community Colleges who wish to transfer to UHM Environmental Studies or would like an environmental program for their Associate of Arts degrees. The advising packet, now in preparation, will identify 100- and 200-level courses that are transferable to the UHM EVS/LS major.

Pacific Environmental Education Consortium

In the Summer of 1977, the Environmental Studies Program secured a grant of \$3,000 to plan and sponsor a Pacific environmental education conference in January 1979. Dr. Maurice Strong has agreed to be the keynote speaker for the conference and to assist in identifying other environmental education experts who might participate. The United Nations Environmental Program and U.N. University have also indicated their willingness to cooperate with the Consortium.

Evaluation

The planning of the new environmental education programs and actual institution of the EVS/LS B.A. program, the Political Ecology M.A. program, and many of the new courses, all within the last 2½ years represent a substantial achievement, especially in the light of the limited resources available for the development.

The registration in the EVS/LS program and indications of intention to register in the Political Ecology and Environmental Education M.A. programs

substantiate initial premises that there was substantial interest in such programs at both undergraduate and graduate levels. Expressions of interest by undergraduates not served by the EVS/LS program indicate the need for establishing at least the proposed Certificate program in addition. The success of the Environmental Forum confirms that an environmental seminar series would attract extensive participation from the University and external community. From the quantitative aspect, then, the environmental education function of the Environmental Center seems to be successfully served by the Environmental Studies Program but there are needs still not met.

A particular need and opportunity for the establishment of new curricula or modification of existing curricula has arisen through the recent establishment by the East-West Center of an Environment and Policy Institute. This Institute will bring graduate students to the University and will wish to place them in programs that will at the same time increase their competence; recognize the increase by appropriate degrees, particularly doctoral degrees; and give the students opportunities to work on projects of concern to the Institute. Discussions involving the Director and staff of the Institute, the Director and Assistant Director of the Environmental Center, and faculty of a few departments have already begun toward identifying:

- i) More specifically the needs of the new Institute;
- ii) Present capabilities of the University to meet these needs;
- iii) Possible developments to increase these capabilities.

Even though there are expressions of interest in programs and courses not yet offered, we do not consider that the full range of interest is yet apparent. The existence and potentialities of the programs are not yet recognized widely enough to assure this. The Environmental Forum is perhaps the major contributor to visibility, but we estimate that only about 30 percent of the UHM faculty and students are aware of the program. In part, increases in numbers of courses, curricula, and participants will in themselves generate increased visibility through their descriptions in the University catalog, and by word of mouth. However, we do not overlook the importance of means for advertisement such as booths at registration, posters, and brochures.

Qualitatively, the Program should be judged not only by the extent to which the program contributes to participant awareness of environmental problems but the extent to which the participants are led to recognize the framework

of natural laws and social needs within which these problems must be solved and the tradeoffs that are inescapably involved in the solutions. We know of no better means to maintain quality in this respect than to assure that the participants are exposed to the diversity of opinions that stem from different disciplines and value systems. The Program already involves a diversity of faculty and student participation, but we will welcome and intend to stimulate still broader participation in the future.

ENVIRONMENTAL RESEARCH

No very clear distinction can be made between the research projects and the service projects undertaken by the Center. On the one hand, the Center has undertaken environmental research only if it was intended to produce results whose dissemination would constitute service. On the other hand, even the most routine of the Center's environmental services have involved some research.

What distinguishes the endeavors discussed here as research from the endeavors discussed later as services is partly the generality of their findings, and partly their involvement of specific research funding from extramural sources.

The research activities of the Environmental Center have involved:

- a) Assistance in the organization and operation of the Hawaii Environmental Simulation Laboratory.
- b) Organization of extramurally supported research projects to meet specific needs identified through Center service activities, brought to the Center's attention by State agencies, etc., and direct administration of a few of these projects.
- c) Other research by Center staff members.
- d) Partial or pilot support of environmental research projects.

It is easiest to describe the Center's research functions separately for each of these forms of involvement, although more than one form of involvement has been represented in some projects.

Hawaii Environmental Simulation Laboratory

The Hawaii Environmental Simulation Laboratory (HESL) was a major ad hoc semi-autonomous endeavor to improve environmental management through the conduct of broad-based interdisciplinary research interactively with the community of potential users of the results. HESL's principal support was in the form of grants from the Ford Foundation and National Science Foundation totalling approximately \$1 million over the 5 year period of its existence.

Although HESL did not become a direct responsibility of the Environmental Center until its waning phase, the Center was intimately involved with its initiation and development. The endeavor is described in Appendix I. To that

description it is necessary to add only a few specific comments on the Center's involvement.

When the concept of HESL was brought to the University's attention by the Oceanic Institute, in 1970, it was the newly created Environmental Center that established a task force to represent the University in disclosing the concept and preparing proposals for external funding. When HESL's linkage with the Oceanic Institute was lost, the Center became but one of several University units whose faculty were involved. The Center Director served as chairman of HESL's governing Core Group and principal investigator under the foundation grants providing its major support. The University's financial support of HESL was in the form of a grant of \$10,000 from the Center; the Center served as a medium through which the State (Office of Environmental Quality Control) channeled some of its contract support for HESL research; and the Center provided space for the HESL endeavor from about 1973 on.

When the success of some of HESL's functions appeared to justify continuation beyond the foundation-supported development period, the Center was selected as the most appropriate permanent University unit to continue them, and the Center assumed responsibility for HESL functions in 1976. A first attempt to secure state underwriting of these functions resulted in a 1976 appropriation that was not released. No appropriation resulted from a second attempt in 1977, and most HESL functions ended with the termination of its last grants and contracts for specific projects. The last remnant is a geographic-information-system project, now dormant pending decisions on proposals submitted for extramural support.

Other extramurally supported projects

The Center has been instrumental in organizing several extramurally supported environmental research projects in addition to those in the HESL endeavor, and has administered a few. To the extent that the scope of one of these projects has fallen primarily within the scope of a single department or research unit of the University, or that one could effectively be divided into sub-projects each of which would be within the scope of another unit, the Center's role has been to plan the projects, arrange for their support, and assure that they were conducted so as to meet their intended needs but not to administer them directly. In the case of a few, however, the scope of the projects was such that the Center itself undertook the administration.

Whether administered by the Center or not, the extramurally supported projects that have been organized by the Center are included in the tabulation in Part A of Appendix J. Products of the research cited in the last column of that table are listed in Appendix L.

Most of these projects grew out of service activities of the Center. These include the projects dealing with the air pollution effects of agricultural field burning, the Ala Wai Canal, the disposal of Pearl Harbor dredge spoil, and the EIS-system. Two of the projects, that on carrying capacity and that on soil creep, were carried out by HESL, and the Center simply served as a coordinating unit. The need for design and conduct of a Mirex monitoring project was brought to the Center's attention by the State Department of Agriculture.

The Mirex and agricultural burning projects involved funding from state agencies and private institutions, and the Department of Agricultural Biochemistry provided for analyses from its own resources in the former. The Office of Environmental Quality Control supplied the extramural support for the Ala Wai Canal, carrying capacity, soil creep, and EIS-system projects. The Pearl Harbor dredge spoil disposal project was funded by the Navy.

Other Staff Research

In addition to the projects with extramural funding, the Center staff have been engaged in environmental research to meet needs for which specific funding has not been available, in areas in which they have special competence, or both. For better management, the Center now recognizes such research as constituting specific projects, particularly when it is intended to produce specific reports or contributions. The more substantial of these projects are included in the tabulation in Part A of Appendix J.

Some of these projects have fallen within the scope of other University units, for example most of the tsunami projects undertaken by Cox. Others have resulted in reports issued by the Center such as the project on the special management area under the Shoreline Protection Act and that on the cost of tsunami false alarms, or in journal publications identified as Center contributions such as those undertaken by Burhans.

Projects supported by Center

Under its contracts with the Office of Environmental Quality Control, the Center had each year certain funds it could use to provide grants in support of special environmental projects undertaken in-house or externally. From these special project funds the Center has provided grants in support of:

- a) HESL
- b) Activities of the Center task force on heavy metal pollution
- c) Hawaii Atlas
- d) Two film projects, "Cloud over the Coral Reef" and "To Heal a Scar"
- e) Environmental Studies development
- f) Preparation and publication of Hawaii Environmental Laws and Regulations and annual revisions

Other special project funds were reserved to provide pilot or supplementary support to research projects proposed by faculty and students. Grants from these funds were made on the recommendation of the Research Subcommittee of the Center's Policy Committee. The projects supported by such grants are tabulated in Part B of Appendix J.

Evaluation

Many of the research units and departments of the University are engaged in environmental research, and the research projects organized, administered, or supported by the Center represent only a very small fraction of the total.

With regard to the extent of environmental research, the Center is concerned primarily that, when needs for such research arise, the competence of the University be considered by both the University and potential clients. The number and diversity of the research projects actually undertaken and the extent to which the Center is consulted by faculty and students of the University and by representatives of government agency and other institutions indicate that the Center is performing creditably in this respect, although we are sure there are unmet or inadequately met needs that do not come to our attention. The loss of the capabilities of the Hawaii Environmental Simulation Laboratory to meet the broadest needs is regrettable, but the Center, HESL, and the HESL Community Council did all that could reasonably be expected to prevent the loss.

With respect to the quality of the research organized or administered by the Center, our concerns are primarily that:

- i) The results of research projects organized and administered by the Center be valid within the context in which they are intended to be used;
- ii) The context be recognized clearly in project formulation and reporting.

Beyond these, the Center is concerned that the results of research be put to use in environmental management, but this is as much of a service aim as a research aim.

ENVIRONMENTAL SERVICES

The environmental services program was the prime focus of the Center's activities in its first several years and still represents its major program.

As indicated in the enabling legislation, the Office of Environmental Quality (OEQC) is an important client for these services. However, the external clientele has included a considerable number of other federal, state, and county agencies and legislative committees, and, indirectly at least, the general public. The University, and its faculty, staff, and students should be regarded as clients also.

External services

In providing its external services the Center follows policies developed by experience which are reflected in guidelines approved by its Policy Committee (Appendix K).

A large part of its services have been in the form of reviews of the environmental aspects of proposed legislation, regulations, plans, permits, and problems. The Center began many of its review activities on its own initiative, taking advantage of public-review and public-hearing opportunities. Increasingly, however, the Center has received requests from agencies and legislative bodies for reviews of specific proposals.

The principal review activities, clients served and numbers of formal reviews produced, have been as follows:

<u>Type of service</u>	<u>No. of products</u>
1. Reviews of environmental impact statements (EIS's):	234
Federal EIS's: For federal agencies direct or through the OEQC or the State Clearing House (DPED)	
State EIS's, original system: For OEQC	
State EIS's, present system. For OEQC or proposing agencies	
Honolulu EIS's, for Department of Land Utilization	
2. Reviews of negative declarations in EIS systems:	25
3. Reviews of agency regulations:	52
For federal and state agencies	

4. Reviews of major variances:	48
For state agencies	
5. Reviews of legislation:	254
For legislative committees, OEQC, etc.	
6. Special reviews:	36
For legislative committees, federal and state agencies	

The reviews produced are tabulated by years in Appendix L.

In addition to those reflected in formal reviews issued by the Center, the Center has provided other services to the external community including:

1. Publication and subsequent revision of Environmental Concerns, a directory to environmental competence, programs, and courses of UH Manoa.
2. Publication and annual revision of the two-volume Hawaii Environmental Laws and Regulations, a compilation of pertinent State documents.
3. Services of staff members on task forces, commissions, and committees, including:
 - a. OEQC Task Force on Keehi Lagoon.
 - b. State Environmental Council (Vice-Chairmanship)
 - c. OEQC-Department of Agriculture Committee on Agricultural Field Burning
 - d. State Carrying Capacity Steering Committee
 - e. Department of Planning and Economic Development Advisory Committee on Natural Resource Evaluation
 - f. Department of Health 208 Water Quality Technical Committee
 - g. State Water Commission
4. Recommendations of other University personnel as members of such groups.
5. Participation by staff members in conferences, symposia, and seminars including those resulting in formal addresses (Appendix K).
6. Informing agencies of research findings pertinent to missions. (The more formal of the reports through which the information was provided are included in Appendix K.)
7. Response to numerous requests, oral and written, for advice, referrals, etc.

Internal services

The clients of Center services are not restricted to those external to the University community. Perhaps the most valuable internal service provided by

the Center has been to provide the coordination through which individual members of the University faculty and staff may contribute effectively to the development and modification of federal, state and county environmental management policies in the State.

Other internal services have included:

1. Service by staff members on University advisory committees such as:
 - a. Marine Affairs Council
 - b. Sea Grant Advisory Committee
 - c. Hawaii Natural Energy Institute Advisory Committee
2. Advice, referrals, or recommendations on numerous environmental matters, for example, on the application of the EIS system to University research (SR:0010, Appendix L).
3. Services of staff on departmental and University committees.

Evaluation

The importance assigned by the external community to the services provided by the Center is indicated by:

1. Requests by legislative committees, or by the Legislature through resolutions, for Center reviews of environmental issues or expansions on reviews provided on the Center's own initiative.
2. Referrals to the Center of all federal EIS's pertaining to Hawaii, all State EIS's, and all Honolulu EIS's.
3. Requests by agencies to expand upon specifics in EIS reviews or review comments of other reviewers, and even informal requests for advice as to the acceptability of EIS's and the appropriateness of negative declarations.
4. Requests for reviews of all proposed environmental regulations and variance requests of the Department of Health, and similar but less consistent requests from other agencies.
5. Requests for service on committees, etc., and importance of those committees.
6. Other requests, formal and informal for advice, referrals, service on committees, etc.

Some of the most important accomplishments have stemmed from providing concerned agencies with research results by other means than the Center's

routine reviews. Successes, limitations to success, and the often long periods necessary for success to mature may be illustrated by a few examples.

- 1) In the first year of the Center's existence, a faculty member approached the Center with a problem. In the course of a research project, he had discovered that a certain food product had a high toxic heavy-metal content. Although there were no specific standards for that metal in that product, the level was higher than standards set for water, for example. The Center recommended that the Department of Health be informed, advised to check the analyses, and given a chance to respond to the situation. The long-term effects were, as expected, that the source of the high heavy-metal content was identified and the manufacturer of the food product required to use other sources. The short-term effects were, however unexpected--a failure of the Department of respond promptly, a premature leak of the information, and a subsequent overreaction. Threats of lawsuits against the faculty member, the University, and the Department did not materialize--very likely in part because of documentation of the episode by the Center.
- 2) About the time that the Center was established, the federal Environmental Protection Agency (EPA) issued a blanket requirement that minimal wastewater be subject to at least secondary treatment. The environmental detriments of applying this requirement to discharges at depth in the open ocean were first brought to public attention by the Center, for example in an EPS enforcement conference in 1971 (EN:0002) at which no state agency indicated either reasons for requesting, or an intent to request, a waiver from the EPA ruling. The EPA subsequently agreed informally to exempt the wastewater discharge from the extended Sand Island outfall serving Honolulu, but by then the requirement had been incorporated in federal legislation. In August 1973, the Center summarized the rationale for amending the federal law (SR:0008), and amendment permitting exemption of open-ocean discharge from Pacific islands was passed in late 1977. In addition to maintaining better environmental conditions, the State will save several million dollars if the Sand Island discharge of wastewater from Honolulu is exempted from the secondary treatment provision, as allowed under the amended law.

- 3) As noted in the research discussion the Center undertook its Mirex research project at the request of the State Department of Agriculture. The request stemmed from a ban by EPA of the use of the insecticide Mirex. A recommendation by EOA technical personnel that pineapple industry useage of Mirex in Hawaii should be exempted from the ban was overlooked, but EPA agreed to staying the applicaiton of the ban, providing the environmental effects were monitored.

The results of the first year's monitoring indicated that there were no significant effects of Mirex use where EOA thought there would be detriments, and the results of the second year's monitoring indicated that exemption of the Hawaiian useage of the insecticide was appropriate. The use of Mirex seemed indeed to be far preferable to the use of alternative insecticides. Unfortunately, Mirex is no longer available for use, because the ban on use elsewhere so reduced the market that it is no longer manufactured.

The importance assigned by the University community to the services provided by the Center is indicated by:

1. The extent to which members of this community are willing to serve on the Policy Committee and to provide contributions to the Center's reviews, without financial recompensè.
2. Requests for staff service on committees and importance of those committees.
3. Other requests, formal and informal.

PLANS AND PROBLEMS

The Environmental Center plans in the future to continue to:

- 1) Coordinate and develop environmental education opportunities in the University, and as necessary, provide these opportunities to students;
- 2) Stimulate, coordinate, contribute to, and as necessary, administer environmental research in the University;
- 3) Coordinate and provide environmental services within the University and from the University to the external community.

We are confident that the rationality of continuance will be apparent to reviewers of this document.

We must call attention, however, to the fact that continuance of the three functions at past levels will not be possible if the support of the Center is limited to the present level. Productivity at the present level is being maintained only as a result of some carryovers of support from the time when the Center had special project funds and "soft-money" support of continuing programs. As a matter of fact, the present level of productivity of services is significantly lower than the level in the past, although the decrease is not yet indicated in the statistics presented in this document. There are several reasons for this:

- 1) Although the Center's budget has been increased during the seven years of its existence, and the allocation for salaries have kept pace with inflation, the allocation for the combination of operating expenses and equipment have not.
- 2) The Center has on its own initiative undertaken to provide services that have been considered valuable and hence have subsequently been officially requested.
- 3) The demand for the kinds of functions the Center provides is far larger than the Center can meet. The workload of the Center in each function therefore expands to meet its capabilities in that function. If with short-term support it expands capabilities in one function it cannot continue to meet the workload in that function without slighting the needs in other functions.

- 4) To develop the Environmental Studies Program the Center allocated a significant part of its continuing staff capability previously involved with research and services, and inverted a considerable amount of its special projects funds. The special projects funds have now been replaced by other "soft-money" and allocation, but the staff allocation continues.
- 5) The Center is left with a legacy of expectations of the HESL endeavor which it has no means to meet.

The difficult problems resulting from the mismatch of workload and support are addressed in "Planning for the Eighties" (Appendix C).

**[CHAPTER 341]
ENVIRONMENTAL QUALITY CONTROL**

SECTION

- [341-1] FINDINGS AND PURPOSE
 [341-2] DEFINITIONS
 [341-3] OFFICE OF ENVIRONMENTAL QUALITY CONTROL, ECOLOGY OR ENVIRONMENTAL CENTER;
 ENVIRONMENTAL COUNCIL
 [341-4] POWERS AND DUTIES OF THE DIRECTOR
 [341-5] STRUCTURE AND FUNCTIONS OF THE ECOLOGY OR ENVIRONMENTAL CENTER
 [341-6] FUNCTIONS OF THE ENVIRONMENTAL COUNCIL

[§341-1] Findings and purpose. The legislature finds that the quality of the environment is as important to the welfare of the people of Hawaii as is the economy of the State. The legislature further finds that the determination of an optimum balance between economic development and environmental quality deserves the most thoughtful consideration, and that the maintenance of the optimum quality of the environment deserves the most intensive care.

The purpose of this chapter is to stimulate, expand and coordinate efforts to determine and maintain the optimum quality of the environment of the State. [L 1970, c 132, pt of §1]

[§341-2] Definitions. As used in this chapter, unless the context otherwise requires:

- (1) "Director" means the director of environmental quality control.
- (2) "Center" means the university of Hawaii ecology or environmental center established in section 341-3(b).
- (3) "Council" means the environmental council established in section 341-3(c).
- (4) "Office" means the office of environmental quality control established in section 341-3(a).
- (5) "University" means the University of Hawaii. [L 1970, c 132, pt of §1]

[§341-3] Office of environmental quality control; ecology or environmental center; environmental council. (a) There is created an office of environmental quality control which shall be headed by a single executive to be known as the director of environmental quality control who shall be appointed by the governor as provided in section 26-34. This office shall implement this chapter and shall be placed within the office of the governor. The office shall serve the governor in an advisory capacity on all matters relating to environmental quality control.

(b) There is created within the university an ecology or environmental center.

(c) There is created an environmental council not to exceed fifteen members. The director shall be the council chairman. The membership of the council shall include: representatives from mass media, and representatives from relevant disciplines, for example, environmental design, natural, physical and social sciences, technologies, social ethics and philosophy, representatives of the university, representatives from business and industry, public and private schools and colleges, and voluntary community group and associations. The members of the council shall serve without compensation but shall be reimbursed for expenses, including travel expenses, incurred in the discharge of their duties. [L 1970, c 132, pt of §1]

[§341-4] Powers and duties of the director. (a) The director shall have such powers delegated by the governor as are necessary to coordinate and, when re-

ENVIRONMENTAL QUALITY CONTROL**Sec. 341**

quested by the governor, to direct pursuant to chapter 91 all state governmental agencies in matters concerning environmental quality.

(b) To further the objective of subsection (a), the director shall:

- (1) Direct the attention of the university community and the residents of the State in general to ecological and environmental problems through the center and the council, respectively.
- (2) Develop a system for monitoring, and arrange for monitoring throughout the State, ecological, environmental and social conditions, changes, and effects such as those involving health, air, water, wastes, noise, soil, and pesticides.
- (3) Conduct research or arrange for the conduct of research through contractual relations with the center, state agencies, or other persons with competence in the field of ecology and environmental quality.
- (4) Encourage public acceptance of proposed legislative and administrative actions concerning ecology and environmental quality, and receive notice of any private or public complaints concerning ecology and environmental quality through the council.
- (5) Recommend programs for long-range implementation of environmental quality control.
- (6) Recommend such legislation as is necessary to preserve the environmental quality of the State.
- (7) Initiate public educational programs.
- (8) Offer advice and assistance to private industry, governmental agencies, or other persons upon request. [L 1970, c 132, pt of §1]

Cross References

Appropriation for yearly contract, the terms and provisions of which shall be mutually agreed upon by the director of environmental quality control and the president of the university. see L 1970, c 132, §2.

[§341-5] Structure and functions of the ecology or environmental center. (a) The center shall be so constituted as to make most effective the contribution of the university to the problems of determining and maintaining optimum environmental quality. Its membership shall be comprised of those members of the university community actively concerned with ecological and environmental problems.

(b) The functions of the center shall be to stimulate, expand, and coordinate education, research, and service efforts of the university related to ecological relationships, natural resources, and environmental quality, with special relation to human needs and social institutions, particularly with regard to the State. [L 1970, c 132, pt of §1]

§341-6 Functions of the environmental council. The council shall serve as a liaison between the director and the general public by soliciting information, opinions, complaints, recommendations and advice concerning ecology and environmental quality through public hearings or any other means and by publicizing such matters as requested by the director pursuant to section 341-4(b) (4). The council may make recommendations concerning ecology and environmental quality to the director and shall meet at the call of the director. The council shall monitor the progress of state, county, and federal agencies in achieving the State's environmental goals and policies and shall make an annual report with recommendations for improvement to the governor, the legislature, and the public no later than January 31 of each year. All state and county agencies shall cooperate with the council and assist in the preparation of such a report by responding to requests for information made by the council. [L 1970, c 132, pt of §1; am L 1974, c 248, §1]

UNIVERSITY OF HAWAII
Honolulu, Hawaii

-2-

July 13, 1970
with editorial revisions
September 18, 1970

Memo to: Harlan Cleveland, President
University of Hawaii

SR:0001

From: Doak C. Cox, Acting Chairman
Executive Committee, Ecology and Man Committee

ESTABLISHMENT OF A UNIVERSITY OF HAWAII
ENVIRONMENTAL CENTER

This memorandum is written in response to your request for an expansion of the 4 June 1970 recommendation by Bruce Etherington, former chairman of the Executive Committee of the Ecology and Man Committee that an Environmental Center be established by the University of Hawaii. Limitations of time, and the absence of several members of the Executive Committee, have prevented the preparation of a joint response, but the action recommended has been the subject of intense study by the Executive Committee during the past year and, by drawing its records and its reports to the parent Committee and other bodies, I can be certain that there would be general agreement with the expressions herein.

The general concern for the environment

Knowledgeable people everywhere are now concerned about the degradation of the environment that has resulted from the existence, increase, and activity of their own species. Most widely felt is a concern for the environmental effects of human wastes, both biological and technological. However, students of natural resources find reason for concern also in the effects of our draft of critical raw materials from the environment and in the interactions between raw material draft and waste disposal.

As is now generally recognized, the rates of raw material draft and waste disposal are related to both population and standard of living. It must be recognized also, however, that these rates may in addition be influenced by cultural orientation. The enormous but not inexhaustible storage capacities of nature and the resulting long lags between human actions and their ultimate environmental consequences have permitted the development of an assumption that selected material aspects of human welfare could be increased without environmental detriments either to other material aspects or to esthetic aspects. The appearance of success thus achieved by technological development under a philosophy of opposition between man and nature is just beginning to crack but it is already obvious

that substantial deleterious environmental changes are underway. A more ecological philosophy, a tradeoff of material aspects of standard of living for esthetic aspects, an orientation toward conservation rather than exploitation, would considerably reduce detrimental environmental effects.

Although there has been some irrational emotionalism in the expression of environmental concerns, a lack of concern is equally irrational. It is not clear how large a world population may be accommodated with any particular standard of living and cultural orientation. It is quite certain, however, that the present trends in population and standard of living cannot continue. How the limitations will become manifest is to some extent within the range of human choice. With adequate knowledge and the will to use it -- with wisdom -- the future of mankind may be a pleasant one. Without such wisdom, the future will be at best rather unpleasant and quite conceivably severely curtailed.

Hawaiian concerns

Hawaiians are unavoidably involved with world-wide environmental problems but have special reasons for concern with their immediate environment. In its mid-oceanic location Hawaii is relatively isolated from the effects of waste disposal elsewhere in the world, and comparatively few drains are made on its non-renewable resources. The agricultural pursuits that were until recently the principal base for the Hawaiian economy were in general conservative of the environment. The Islands have, however, not been immune to the effects of increases in population and standard of living. Accelerations in the rates of increase have now resulted in readily recognized problems, while at the same time increasing economic reliance on tourism associates the potential of particularly serious economic losses with such problems. Because of ecological and socio-economic peculiarities associated with the geographic historical and setting of the Islands, special local solutions will have to be provided for these problems.

Recognizing the importance of environmental concerns in Hawaii, the 1970 legislature has passed and the governor has signed a bill (SB 1132-70) that adds to the statutes of the state a new chapter on "Environmental Quality Control" whose findings and purpose are stated as follows:

"The legislature finds that the quality of the environment is as important to the welfare of the people of Hawaii as the economy of the State. The legislature further finds that the delineation of an optimum balance between economic development and environmental quality deserves the most thoughtful consideration, and that the maintenance of the optimum quality of the environment deserves the most intensive care."

The new act calls for the creation of an Office of Environmental Quality Control within the Office of the Governor to be headed by a Director of Environmental Quality Control, an Environmental Council to provide liaison between the Director and the public, and an ecology or environmental center within the University.

Appendix B

The role of the University

The University has or should have a substantial role with regard to many phases of the identification, diagnosis, and solution of environmental problems.

Research is quite clearly involved, because in very large part the problems arise from lack of understanding of the environment, the natural ecological principles operative in it, technological effects and social responses to environmental change.

Instruction of several kinds must be involved:

- a) Graduate instruction: for professional service in environmental disciplines.

- b) Undergraduate instruction:
 - i) for professional and subprofessional environmental services
 - ii) for managerial services in enterprises affecting or affected by the environment
 - iii) liberal education of the influential electorate to cope with the future environmental decision making.

- c) Community colleges:
 - i) possible technical training
 - ii) liberal education of the electorate.

- d) College of education: education of educators of generations of capable of facing the more difficult environmental decisions of the future.

- e) General education:
 - i) professional and technical retraining
 - ii) further education of the electorate.

Public service must be involved in assuring, so far as possible, that all pertinent knowledge is brought to bear on environmental problems. Many kinds of disciplines are involved, including:

- a) Natural sciences: the natural environment and ecological principles.
- b) Applied sciences such as those of engineering, architecture, and agriculture: technology pertinent to natural resources development and conservation.
- c) Medical sciences: environmental effects on human health.
- d) Social sciences: economic and sociological effects of environmental changes, perception of environmental problems, institutional means for achieving and controlling change.

- e) Humanities: human goals in relation to the control of environmental change and the balance of material and non-material aspects of welfare.

- f) Travel industry management: the importance of environmental concerns to a tourist industry.

The faculty must be involved because of their competence in technical and professional matters. The students must be involved because of their greater expectancies of life in the consequences of current environmental decisions.

With respect to specific environmental concerns, the University has had for some time a few strong programs, for example, those dealing with agriculture, land use, fisheries, water resources, tsunamis. In the past year, a number of courses having to do with the environment, conservation, and pollution have appeared scattered through several departments. Suggestions of engineering that they broaden their areas of responsibility to include environmental concerns more generally. A new "Survival College" has been proposed, and an ecology college has been suggested as a component of the planned new Dahu campus. The Architecture Department proposes to expand its competence into Environmental Design, and a Pacific Urban Studies and Planning Program has begun.

The proliferation of environmental courses, projects, and programs is an indication of the widespread and intense extent of interest in environmental concerns, but not of concerted planning. In spite of the proliferation and a good deal of apparent overlap there are some major areas in which only spotty, inadequate efforts have been made, of which air pollution is perhaps the major example.

The tendency of universities to restrict themselves to matters of principle rather than practice, simplified problems that can be handled within the framework of a single discipline, has been vigorously opposed in recent years by those proclaiming the need for "relevance". As a matter of fact, relevance to practical problems has always been an expressed goal of land-grant colleges. Since the founding of the College of Hawaii, training has been offered in the fields of agriculture and engineering that are now represented by professional colleges in the University of Hawaii. According to the Academic Development Plan II (p. 89), " . . . in the tradition of land-grant universities, this institution concerns itself with research which promises to contribute significantly to the development of the State." Public service is regarded as one of the regular functions of the University and according to APR II (p. 15) " . . . service begins at home. The primary responsibility of the University of Hawaii and of each of its constituent units is to serve the people of Hawaii."

A beginning toward coordination of environmental concerns in the University has been provided by the Ecology and Man Committee established under the Graduate Division by Dean Hylze Gorter in June 1969, as a result

of recommendations stemming originally from an April 1969 ASUMI Symposium of "Technology's Impact--the Pacific Environment". During the past year this Committee, through its executive committee or special ad hoc subcommittee has:

- a) Prepared a catalog of the environmental interest and capabilities of Manoa campus faculty, departments, institutes, courses, and research programs.
- b) Prepared testimony for State House and Senate Committees relating to a large number of bills with environmental aims.
- c) Advised representatives of the State administration and the legislature on appropriate means for organizing for environmental quality control.

The way is now clear for the University to further significantly the stimulation and coordination of its efforts with respect to understanding the environment and coping with environmental problems by the establishment of an Environmental Center as recommended by the Ecology and Man Committee and as authorized by the Environmental Quality Control Act.

Establishment of the Center

Concerning the Environmental Center, the Environmental Quality Control Act specifies (Sec. 5):

"(a) The center shall be so constituted as to make most effective the contribution of the university to the problems of determining and maintaining optimum environmental quality. Its membership shall be comprised of those members of the university community actively concerned with ecological and environmental problems.

"(b) The functions of the center shall be to stimulate, expand, and coordinate education, research, and service efforts of the university related to ecological relationships, natural resources, and environmental quality, with special relation to human needs and social institutions, particularly with regard to the State."

The Act further specifies (Sec. 4) that the Director of Environmental Quality Control shall:

"(1) Direct the attention of the university community . . . to ecological and environmental problems through the center. . ." and

"(3) Conduct research or arrange for the conduct of research through contractual relations with the center. . ." etc.

The Act makes an appropriation to further its objectives, from whose total amount "\$73,000 shall be expended by the University of Hawaii ecology or environmental center in accordance with a yearly contract, the terms and

provisions of which shall be mutually agreed upon by the director of Environmental Quality Control and the president of the University of Hawaii."

As a token of its autonomous intent, the University should establish the Environmental Center as soon as possible, without waiting for the negotiation of a contract with the Office of Environmental Quality Control.

Considering the range of functions, disciplines, and people that should be involved in its program it would be a mistake either to subordinate the Environmental Center to any single college or to attempt to create it as a unit duplicative of competence in the colleges. The Center should be established in the central administration of the University, responsible to the Vice-President for Academic Affairs, where it can take advantage of pertinent competence wherever it exists in the University.

The Center should not have budgeted to it any academic faculty except as necessary to provide for its administration, and as may possibly be found necessary in the future to provide for the rare interdisciplinarian whose professional advancement would not be adequate in any department. Rather the Center should include in its faculty membership all members of the academic faculty of the University who wish to be included and are considered by its faculty to be sufficiently concerned with and competent in some phase of environmental matters. Substantial involvement in any Center program should necessitate approval also of the chairman of the department or other unit in which the faculty member is budgeted.

Initially the faculty membership of the Center should be those listed in the environmental catalog compiled by the Ecology and Man Committee who are on duty during the Fall semester 1970. Although its program will thus be confined initially to the Manoa campus, it should expeditiously be expanded to all of the campuses of the University, including those of the community colleges, so that it may relate most effectively to problems arising in all parts of the islands.

The Center should be administered by a Coordinator to be named by the President, who shall be budgeted at least half time in the Center. The Coordinator should be advised and assisted by a Policy Committee of at least five faculty and two student members to be named by the President after consultation with the Coordinator. Means should be provided for soliciting nominations from the faculty of the Center for faculty appointments to the Policy Committee, and the selection shall be such as to be broadly representative of disciplines and colleges involved in the program. Appointments to the Policy Committee should be for a year, renewable for the sake of continuity. Initial members of the Policy Committee should be named from members of the Policy Committee of the Ecology and Man program.

Insofar as possible, the Center should arrange with instructional departments for the offering of courses dealing with the environment. It should, however, be empowered to establish under its own organization such courses as are so interdisciplinary in nature as not to be appropriately taught within any department. Very likely one or more seminars of the

later sort will be desirable. Formal courses, whether experimental or permanent, should be subject to the normal University review procedures.

Insofar as possible, the Center should arrange with appropriate departments or research units for the conduct of such research as it considers desirable. It should, however, be empowered to administer, itself, such research projects as do not fall principally within the mission of any department or research unit. For this purpose, the Center must be able to employ technical and professional personnel other than academic faculty, and academic faculty on overload. In its negotiation for research grants and contracts and its administration of research it should be responsible to the Office of Research Administration.

Some of the most important functions of the Environmental Center will be certain kinds of public service. On the request of the Director of Environmental Quality Control, as prescribed in the Environmental Quality Control Act, on the request of government officials or legislators, and on occasion on its own initiative as a result of research or otherwise, it may be appropriate for the Center to prepare a statement on some environmental problem representing the consensus of those of its faculty having competence bearing on that problem.

A statement prepared under the auspices of the Center in this way should generally merit greater consideration than a statement prepared on a purely personal basis. However, except as the University as an institution has some responsibility in the matter and as the statement is duly approved by the University administration, such a statement cannot be regarded as representing an institutional position of the University. The Center should assure that, so far as possible: a) competence pertinent to all significant aspects of a problem be involved in the preparation of such a statement on the problem; b) limitations of competence and limitations of data be identified; c) inter-disciplinary divergences of opinion on the problem, after resolution so far as possible, be expressed; d) goals and values approved be recognized; and e) any statement so prepared be adequately reviewed. No control on the issuance of statements on behalf of the Center should affect the academic freedom of its faculty members in the expression of their personal opinions.

The Center must be provided with adequate secretarial, clerical, and editorial staff, which may include civil service, APT, and student help. Because of the widespread nature of the program, good communication will be essential, probably involving a newsletter, and the secretarial help must be highly qualified. Faculty members of the Center will in general be housed with their departments rather than in Center headquarters, but the Center will need adequate space for its administrative offices, a reading room, and a conference room. Additional space may be needed in the future depending on the appointment of interdisciplinary faculty or the direct undertaking of research programs.

Pending the receipt of the contract to be negotiated with the Director of Environmental Quality Control the program of the Environmental Center should be underwritten and initially supported from the regular appropriation to the University in accordance with one of the following alternatives. Listed in decreasing order of desirability:

- a) support at the full level provided under the Environmental Quality Control Act (\$73,000/annum);
- b) support for the basic administrative functions but not special projects (approx. \$45,000/annum);
- c) support for a secretary and minimum operating funds (approx. \$15,000/annum);
- d) minimum operating funds (approx. \$5,000/annum).

Budgets for the Center should be prepared for the biennium 1971-73 as part of the budgets of the University, at least with respect to basic salaries and operating expenses. Reliance on contract support from the Office of Environmental Quality Control may perhaps be satisfactory for major projects, but the Center should not be dependent on the Office of Environmental Quality Control for the support of its continuing operation and seed money for pilot research.

Any program as novel as this must be regarded initially as an experiment. It is quite probable that some changes will appear desirable after a year's experience. Although there has been wide faculty participation in the general planning under the Ecology and Plan Committee, the details of organization here presented have not been widely reviewed. The program has been discussed informally with the University Senate Executive Committee but not formally reviewed as one competitive for future University funding should be. Hence the Environmental Center should be established initially on a trial basis. Its organization and operation should be briefly reviewed prior to University approval of its budget request for 1970-71, and more thoroughly in the fall of 1971 after the experience of a year of operation prior to University approval of its budget for 1972-73.

Recommendations

For the reasons discussed above, I recommend that the University of Hawaii act now to establish an Environmental Center with the organization, responsibilities and character described.

Doak C. Cox

cc: Ecology and Plan Executive Committee
Gregory Bateson Robert Gay
Bruce Cook Howard Harrenstien
Louis Dickinson Herbert Long
Bruce Etherington Samford Siegel
Wytze Gorter, Dean, Graduate Division
University Senate Executive Committee



University of Hawaii at Manoa

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Office of the Director

MEMORANDUM

TO: Howard HicKaughan
Dean, Graduate Division

FROM: Doak C. Cox, Director

PLANNING FOR THE EARLY EIGHTIES:
ACADEMIC PLAN--ENVIRONMENTAL CENTER

The staff of the Environmental Center have prepared the following
contribution to Part 2 of ADP III in the form A. statements on philosophy,
objectives, achievements, aspirations, and B. answers to the questions
raised in Vice-Chancellor Ashton's memorandum of 7 August 1977.

1. Philosophy
The philosophy underlying the Environmental Center program is best expressed
in the form of a series of premises.

- a) Many human actions undertaken for the sake of certain benefits, especially
short-term tangible benefits accruing to individuals and small groups,
turn out to have environmental consequences that are detrimental in the
long term, in intangible ways, or to people in common.
b) Even the intangible environmental detriments are significant, and the
total detriments of many actions outweigh the benefits for which they are
undertaken.
c) Premises a) and b) have been valid even in the case of actions that
are subject to public regulation.
d) Improvement in the benefit/detriment ratios for action effects is possible.
e) To a significant extent, the improvement in d) depends upon increased
understanding of the consequences of actions on the part of decision-
makers, including those who are primarily responsible for the undertakings
and those who have the powers to regulate them.

Recognition of the preceding premises was formally acknowledged by the State
of Hawaii in the passage of the Environmental Quality Control Act of 1970 (HRS 341)
that called for the establishment of the Environmental Center at the University
of Hawaii. The remaining premises are specific to the Environmental Center:

- f) The functions of the University include: i) the education of those
who will be planners, undertakers, or regulators of actions, including
education with respect to the environmental consequences; ii) the
conduct of research into the nature of the environment and the conse-
quences of actions affecting it; and iii) the provision of services
to the community, including appraising the environmental consequences
of actions and environmental implications of policies.
g) Any effort to improve environmental decision making must take into account
benefits and detriments that are both tangible and intangible, short-
and long-term, and specific and general.
h) The information needed for this improvement is never single disciplinary.
Hence, although disciplinary and therefore departmental strengths are
needed in the University, its environmental education, research, and
service efforts will be most effective only if means are provided for
their transdisciplinary and transdepartmental coordination with respect
to environmental problems.
i) The environmental competence of the University is not restricted to any
one college or campus. Hence coordinating functions of a University

environmental unit should be system-wide, although they may be placed administratively within a campus or college.

j) The competence of the University represents a considerable part of the overall competence that can be related to objective aspects of Hawaiian environmental problems. The University community has, however, no special competence with respect to such subjective aspects as those reflected in esthetic or ethical judgments. Hence, the services of a University environmental unit should reflect an activist but not an advocacy role.

2. Aims

Among the objectives of an enterprise it is useful to discriminate between aims, toward which the enterprise is directed but which can never be fully achieved, at least by the enterprise alone, and goals which the enterprise expects to achieve.

HRS 341-5(b) states that:

The functions of the Center shall be to stimulate, expand, and coordinate education, research, and service efforts of the University, related to ecological relationships, natural resources, and environmental quality, with special relation to human needs and social institutions, particularly with regard to the State.

The fundamental aim of the Environmental Center is to contribute to the improvement of environmental management through the effective performance of each of its recognized functions:

i) In its educational function, the aim is to increase the general environmental understanding of students who will make decisions affecting the staffs of governmental or private organizations, or iii) members of the general electorate.

ii) In its research functions the aim is to increase the scope of and provide focus to environmental research and to improve the reliability of environmental research results.

iii) In its service functions the aim is to make direct, objective contributions to environmental decision making.

3. Goals

The selection of achievable goals has been directed to initiating and optimizing the performance of the Center with respect to the above aims:

a) Initial goals:

i) To implement HRS 341-3(b): "There is created within the University an ecology or environmental center."

ii) To comply with HRS 341-5(a):

The Center shall be so constituted as to make most effective the contribution of the University to the problems of determining the optimum environmental quality. Its membership shall be comprised of those members of the University actively concerned with ecological and environmental problems.

b) Educational goals:

i) To identify and coordinate courses and curricula of the University bearing on environmental problems.

ii) To advise students on choices among such courses.

iii) To expand or stimulate the expansion of environmental course offerings and curricula.

c) Research goals:

i) To identify and coordinate research projects and programs of the University bearing on environmental problems.

ii) To support, or to stimulate and coordinate the support of, certain environmental research projects and programs.

d) Service goals:

i) To identify decision-making processes which the University may usefully contribute environmental information.

ii) To coordinate and inject such information into certain of these processes.

4. Achievements

Achievements with respect to the above goals have been as follows:

a) Initial and general

i) The Environmental Center was established in 1970.

ii) The membership of the Center is open ended, as implied in the second goal. The active membership, comprised of those who serve on its policy committee and those who have made substantive

contributions to its educational, research, and service functions exceeds a hundred in any year and several hundred in period of the Center's existence.

iii) Appointment of a small internal staff, headed by a Director.

iv) Involvement of a Policy Committee representing broadly the departments, colleges and campuses of the University and including, in addition, ex-officio, the Director of the State Office of Environmental Quality Control.

v) Successive changes of administrative placement from the Office of the Vice-President for Academic Affairs, to the Office of the Manoa Chancellor, and now to the Office of Director of Research, while retaining its system-wide function.

vi) Primary continuing support through the University budget.

vii) Issuance of a directory of environmental concerns of the University for the use of students, faculty, and potential clients of services.

viii) Establishment of an environmental resource center.

b) Education

i) Provision of advice to students on registration for courses and in programs with environmental emphases.

ii) Development and institution of an Environmental Studies option under the Liberal Studies program.

iii) Development and institution of several new environmental courses.

iv) Development of plans for an undergraduate Environmental Studies major program and an Environmental Option program leading to certification, and additional courses within those programs.

c) Research

i) Coordination of environmental research through staff representation on coordinating committees such as those of the Natural Energy Institute, Sea Grant program and environmental curriculum development projects in the Curriculum Research and Development Group of the College of Education.

ii) Organization and coordination of support for several research projects and administration of a few, e.g., Air quality effects of agricultural field burning, HIREX monitoring, Ala Kai Canal improvement, Dredge spoil disposal, Local tsunamis.

iii) Provision of leadership and assistance in the initiation and operation of the Hawaii Environmental Simulation Laboratory.

iv) Direct partial support of a number of research projects.

d) Service

In addition to disseminating or assisting in the dissemination of the results of research projects; the Center has:

i) Been represented on several continuing or ad hoc governmental advisory or coordinating groups, e.g., Environmental Council, Carrying Capacity Hearing Committee, Water Commission, Water Quality Standards Committee.

ii) Reviewed the most important environmental impact statements and related documents, environmental legislation, environmental regulations of governmental agencies, and agency-granted variances from environmental standards.

iii) Publication and annual revision of the two-volume "Hawaii Environmental Laws and Regulations."

iv) Responded to a number of legislative and agency requests for special reviews and reports.

v) Responded to a large number of requests for addresses, panel discussions, etc.

5. Aspirations

The aspirations of the Center may be related to its goals and achievements as follows:

a) General:

i) The first aspiration must be to maintain the constitution that permits it to be effective.

ii) Since revision of the Directory of Environmental Concerns of the University has lapsed, it must be an aspiration to resume its periodic revision.

iii) Closer coordination of inter-college and inter-campus environmental activities once seemed possible with an increased level of support. The increased support did not materialize, hence the close coordination, which was to have been achieved by the part-time Center support in several colleges and on several campuses remains an aspiration.

b) Education:

i) Institution of the Environmental Studies major, the Environmental Studies certificate program, or both, together with necessary courses.

ii) Assistance to UHM departments in the establishment of such graduate-level programs as will best serve the needs of the new East West

Center Environment and Policy Institute, for example, the proposed Political Ecology Masters-level concentration in the Political Science Department, and the environmental education concentration in the Educational Foundations Department.

- iii) Coordination and sponsorship of the on-going Environmental Forum.
- iv) Assistance in the development of environmental courses and curricula at UH Hilo and the Community Colleges.

As was expected, there was a "backlash" against the more extreme proposals for preservation of the natural environment that were advanced in the "environmental movement." The backlash may already have peaked--in any case the expressed needs for rational analysis of the environmental implications of decisions on general policies and individual actions continue high. Nationally and internationally, efforts to develop and improve methods for analyzing of such implications are expanding. For example, though rates of increase in population pressures in some areas have slackened, there is every reason to believe that, with the continuing expansion of the world population, the continuing development of new technologies, and the decreasing availability of natural resources, (particularly energy), the needs and efforts to evaluate and cope with them will increase in the foreseeable future.

The establishment of the Environment and Policy Institute in the East West Center is a development that has special implications for the environmental Center. This new institute should be an especially effective mechanism for transferring Hawaiian experience in environmental management (and the Center's contribution to this experience) to the wider scene, and the reverse. The new Institute will also increase the demand for education linking development with environmental issues, in the form of problems to be addressed in graduate study and Institute supported graduate students.

Reinstitution of the kind of broad, interactive research that was provided by the Hawaii Environmental Simulation Laboratory, through the provision of continuing base-level funding to be supplemented by grants and contracts.

d. Service programs

- i) Continue the annual revisions of Hawaii Environmental Laws and Regulations which is jeopardized with the present level of funding.

B. Responses to specific questions

1. How would you order your priorities in the next six years given the present trends and future anticipated developments in your discipline/profession?

Comment on External Trends

As was expected, there was a "backlash" against the more extreme proposals for preservation of the natural environment that were advanced in the "environmental movement." The backlash may already have peaked--in any case the expressed needs for rational analysis of the environmental implications of decisions on general policies and individual actions continue high. Nationally and internationally, efforts to develop and improve methods for analyzing of such implications are expanding. For example, though rates of increase in population pressures in some areas have slackened, there is every reason to believe that, with the continuing expansion of the world population, the continuing development of new technologies, and the decreasing availability of natural resources, (particularly energy), the needs and efforts to evaluate and cope with them will increase in the foreseeable future.

Changes in Center priorities

We call attention to the fact that the Center's role is specifically the stimulation, expansion and coordination of all three major functions of the University and not necessarily their performance. With respect to these functions the priorities and mode of Center operations have changed somewhat in the first seven years of the Center's existence and should change somewhat in the next six years.

The stimulation, expansion, and coordination of the University's environmental services were initially given highest priority in the Center. The relative priority of environmental service efforts had of course to shrink as educational and research efforts were expanded, and must be expected to shrink further if educational and research efforts are to be expanded further. However, coordination is the essence of the environmental service efforts, and the University's environmental services have become of critical importance in the State. Hence absolute reductions in the Center's service efforts should be minimized.

The Center has contributed to the stimulation and expansion of the University's environmental research efforts by a combination of coordination

of the research of other units and individuals not on the Center's staff, the coordination of the support of this external research, the provision of some minor support to the external research, and the engagement of Center staff members themselves in research. In the period since the Center's establishment, both the priority given to its research efforts and the absolute magnitude of these efforts have increased (except as the Center no longer has special funds that it can use for the support of research). Although the need for environmental research may be expected to increase substantially, the Center cannot afford to increase further the priority given to its research function, and hence must meet its obligations increasingly by stimulating and coordinating the efforts of other units and persons not on its staff.

In the last three years the Center has increased substantially the priority and absolute magnitude of its educational efforts, providing substantially for the development and conduct of the Environmental Studies Program, although it is placed administratively in the college of Arts & Sciences. There are needs for adding to the component of that program within Liberal Studies, a component providing an environmental bachelor's degree, a option providing a certificate of competence in environmental studies, or both; and also graduate-level components. A high priority must be given by the Center to seeing that these needs are met, but the administrative structure under which they are to be met has not yet been clarified and the absolute support that the Center provides to the environmental educational efforts of the University cannot be increased unless the support of the Center is increased.

In summary, changes in priorities of the Center in the next six years depend somewhat on the extent to which the Center itself must be responsible for meeting increasing needs for environmental education and its given the means to meet these needs. If these needs are met by expansion of a separately supported Environmental Studies Program, the priorities will remain with highest weight given to environmental services and about equal weights given to environmental education and environmental research. If the educational needs must be met within the program of the Center, the priority to environmental education must increase and the priorities to services and research must decrease. In the absolute sense, however, the support of environmental education should increase without decreasing the support of environmental services and environmental research.

While we have met and expect to continue to meet, some of the immediate and on-going Environmental Studies Program's needs with external funding, we cannot rely on these "soft-money" sources for long range planning purposes.

2. What means do you have for improvement in the quality of programs under the current level of funding.

With respect to quality, the essential concern of the Center is that its programs serve the diverse needs of a variety of client groups and provide each group with appropriate means to make balances of environmental benefits and costs such as are represented in long-term vs short term issues, individual vs common interests, and tangible vs intangible values. In general or in relation to specific functions our more specific concerns or plans are as follows:

- a) General: We are endeavoring to organize better the resources of the Center to facilitate and make more profitable their use by students, faculty, and staff.
- b) Education: We are attempting to expand and enhance the Environmental Studies Program offerings with external support. To a considerable extent the expansion planned relates to serving new clients and is addressed in response to question 5.
- c) Research: Our concerns with the quality of research are specifically that the results of research be valid within the context on which they are intended to be used, and that the context be recognized clearly in project formulation and reporting. We propose no changes in means to maintain quality in these respects.
- d) Service: Maintaining the quality of our service efforts depends upon obtaining contributions to these efforts from diverse disciplines and departments. With the reduction of priority of our service efforts, we have had to reduce the number of reviews of various kinds undertaken, but even so the average number and diversity of contributions solicited and incorporated per review has been reduced somewhat, and we are becoming increasingly selective of reviews undertaken to restore optimum diversity.

3 (A). What programs would you phase out or develop in some other way in the event of a cut in the budget:

Programs on projects within the Environmental Center that would most likely be reduced or eliminated would be:

- 1) Comprehensive resource-center operation and services. (Hours of resource-center availability to students and faculty. Assistance to Environmental Studies students and others on environmental projects from our resource-center staff would have to be reduced.)
- 11) Newspaper clipping service which takes considerable student help time and is part of our resource-center service. This service would probably have to be eliminated.
- 111) Environmental research and consultation including that performed for government agencies. (We would certainly have to reduce these, though not eliminate them.)

2. What means do you have for improvement in the quality of programs under the current level of funding.

11) Within the Environmental Studies Program, a reduction in the curriculum and course development services rendered to the UI community colleges (particularly HCC and Kapiolani CC). (Student legislative and research projects are a strong part of the Program, but with reduced funding the EVS faculty and counselors would have to decrease their assistance on these projects. Such projects include: Earth Day exhibits, Bottle-Bill legislation research, Steady-State Economy, Kanoho Bay coral reef research, etc.)

- v) Review of E.I.S.'s, Negative Declarations, agency regulations and variances, legislation etc. (Such reduction would be very unwise, but might be necessary.)
- vi) Up-dating Environmental Rules and Regulations (unless this could be transferred to another office).

3 (B). What would you do given a modest increase

If provided with a modest increase in budget we would:

- i) Maintain such services as the annual revision of Hawaii Environmental Laws and Regulations and up-dating the directory of environmental concerns at the University.
- ii) Improve our resource-center services to students, faculty and staff.
- iii) Expand our assistance and environmental course and curriculum development activities at the Hilo College and community colleges.
- iv) Assure adequate diversity of contributions to our review activities.
- v) Extend the experience gained from our educational, research, and service functions more widely through more extensive formal publication, participation in regional conferences, etc.

4. Would greater cooperation and participation between your school or college and other schools and colleges cause changes in faculty allocation and therefore the utilization of resources?

The cooperation of college, schools, departments and other units with the Environmental Center has in general been excellent. Limitations to such cooperation stem either from the staff limitations of the Center or from the reward structure of the University as interpreted by other units. Departmental or administrative placements of low values on interdisciplinary team efforts (as distinct from disciplinary and individual efforts), and on service activities (as distinct from instructional activities or research activities leading to formal publication) clearly place faculty who contribute to the activities of the Center in jeopardy with respect to tenure and promotion, and hence may limit such participation.

5. What shifts in clientele being served do you anticipate in the next six years? (Include changes in size, level, target groups, etc.) Are there changes in your clientele which you believe will necessitate a reassignment of faculty and an eventual redistribution?

We anticipate no significant changes in the clientele of the Centers service activities. The clients of its research projects change from time to time, but we anticipate no changes in the kinds of clients.

We anticipate, however, that the student clientele of the Environmental Studies program component in Liberal Studies will continue to increase to an enrollment of about 40. We also anticipate that the clientele of the Environmental Studies program should be enlarged to include undergraduate students who wish to receive degrees other than in Liberal Studies, and to include undergraduate students in an undergraduate environmental degree or certificate program and enrollments for environmental graduate degrees totalling of 20 to 30.

6. What innovations in teaching, research and community service do you anticipate that will contribute to more effective utilization of resources, more effective service, reaching a larger number with the same resources? Would the utilization of innovative non-traditional modalities of education enable you to change your resource allocation?

Processes already set in motion in the areas of environmental education (EVS Program) and our Ec Library we think will ensure more effective utilization of these resources and services. Both have been in the early development stages for a year or more but are ready for full service at this time. They will indeed reach an increasing larger number of students and faculty.

7. What arrangements do you currently have in the area of evaluating program effectiveness; what improvements do you plan in the future.

In the evaluation of the Environmental Center program we rely especially on the Center's Policy Committee whose members are appointed by the Director of Research from diverse components of the University system. The Committee meets infrequently, but its members are kept informed of Center activities generally and their advice is solicited on policy questions.

The Policy Committee cannot directly estimate the effectiveness of the program in the external community, but its kept informed of evidences of external effectiveness. The Center has no equivalent to the Community Council that served the Hawaii Environmental Simulation Laboratory, that was associated with the Center but supported mainly by extramural funds. The Chairman of the Community Council has been approached with respect to its possible service to the Center, now that the Laboratory endeavor has ended, but no decision has been made on this.

Estimators used include, with respect to:

- a) Internal effectiveness
 - i) Extent of student solicitation of advice on courses and curricula.
 - ii) Extent of faculty and student use of Center resources and solicitation of advice on environmental problems.
 - iii) Numbers of students enrolled in and graduating from Environmental Studies.
 - iv) Extent of faculty participation in service activities.

b) External effectiveness

- i) Center service productivity.
- ii) Extent to which Center recommendations are considered in the revision of environmental impact statements, proposed legislation and regulations, grants of variances, etc.
- iii) Extent to which the Center is requested to expand on previously volunteered recommendations or to provide recommendations on additional questions.
- iv) Extent to which the Center is requested to plan, coordinate, or undertake research projects.

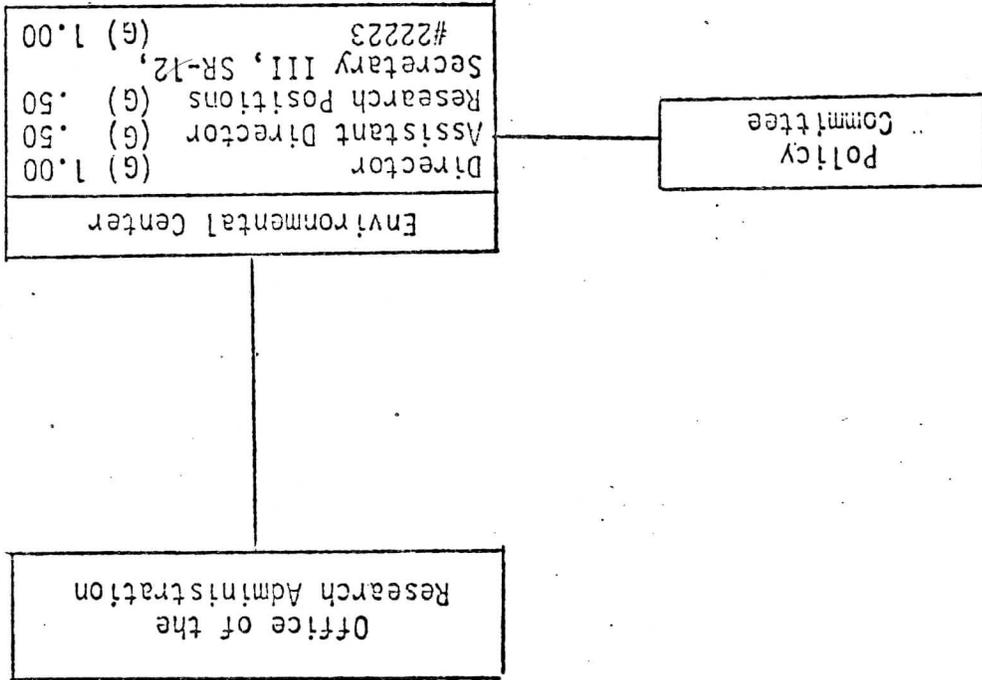
8. Are there plans for improved efforts of faculty development? What new ideas, innovations does your plan have?

The Center contributes to faculty development (including the development of faculty members of its staff) by providing opportunities to further their own competence and the use of their disciplines in interdisciplinary activities related to "real-world" problems and by providing forums for testing their disciplinary capabilities and contributions in the light of "real-world" interdisciplinary needs. We have no definite plans to use other means for faculty development although, of course, we wish to expand the opportunities.

9. What future innovations within the university would you indicate as necessary or helpful in developing increased program effectiveness in your college or school?

- a) We would encourage the establishment of quasi-independent environmental coordination units in many of the schools and colleges of UHM (such as recently existed in the college of Tropical Agriculture) and in other campuses of the University.
- b) We would encourage more appropriate recognition of interdisciplinary team, and service activities in the reward structure of the University.

(July 1977)



STATE OF HAWAII
 UNIVERSITY OF HAWAII
 UNIVERSITY OF HAWAII AT MANOA
 ENVIRONMENTAL CENTER
 ORGANIZATIONAL CHART

Appendix E

Environmental Center Annual Budgets 1970-78

Year	Salaries and wages	Student Help	Fringe Benefits	Total	Operating Expenses	Equipment	Total Basic Operation	Special Projects	Total
1970-71 ^{a)}	\$33,786	5,014	8,388	\$63,732	7,200	5,000	\$51,000	22,000	\$73,000
1971-72 ^{a)}	\$49,344	6,000	9,602	\$67,850	7,675	1,593	\$73,000	b)	\$73,000
1972-73 ^{a)}	\$50,538	7,710	9,000	\$52,022	4,650	500	\$73,000	b)	\$73,000
1973-74 ^{a)}	\$43,022	9,000	8,843	\$52,022	5,400	1,000	\$57,422	18,578	\$76,000
1974-75 ^{a)}	\$55,557	9,000	8,843	\$64,400	5,600	1,000	\$71,000	8,000	\$79,000
1975-76 ^{a)}	\$67,267 ^{d)}	9,000	6,051	\$76,267	6,051	1,000	\$83,318	6,700	\$90,018
1976-77 ^{a)}	\$69,735 ^{d)}	9,000	8,288	\$78,735	8,288	1,000	\$88,203	7,625	\$95,648
1977-78 ^{e)}	\$69,546	12,914	8,366	\$82,460	8,366	500	\$91,326	f)	\$91,326

Notes:

- a) 1970-77 funds were provided through annual contracts with OEQC except as indicated in d). Actual expenditure patterns have departed somewhat from budgets, especially in 1970-71.
- b) Special project funds were not differentiated in budgets for 1971-73.
- c) Fringe benefits were not budgeted but were paid in 1970-71. In 1973 the decision was made that fringe benefits need not be budgeted from funds received by contract from OEQC.
- d) Salary increases in 1975-77 were paid from funds appropriated to the University.
- e) 1977-78 funds are provided through appropriation to the University.
- f) No special project funds provided.

ENVIRONMENTAL STUDIES

SUGGESTED COURSES - SPRING & FALL 1978:

SPRING 1978

* I. S. 210

INTRODUCTION TO ENVIRONMENTAL ISSUES

BIGELOW/BOYER/O'REILLY

A study of environmental issues and potential solutions, team-taught by a natural scientist, a social scientist, and a humanities professor. The course deals with issues of natural science, with social environmental issues which arise from and independently of the natural concerns, and with questions of values.

PHIL 100

INTRODUCTION TO PHILOSOPHY Sec. 2

BENDER

A discussion of the formation of modern Western thought, our perception of the relationships among men, nature and science. An examination of how these perceptions have led to exploitation of nature and of other people, and a study of the writings of some people who have argued that we need to change.

* POLSC 300

POLITICAL PHILOSOPHY AND THE ENVIRONMENT

HENNINGSEN/KARIEL

The course will attempt to clarify and analyze the major socio-environmental crises facing mankind today and in the near future. Its central task will be to thoroughly examine the political manifestations and machinations surrounding these international ecological issues.

* ARCH 341

INTRODUCTION TO PLANNING AND URBAN DESIGN

PREUSS

What is the basis for the various lines that are drawn between aspects of ourselves, ourselves and work, ourselves and others around us, ourselves and our environment? How can we get in touch with these relationships? When could we change them?

* POLSC 375(alpha)

POLITICS OF ENVIRONMENTAL HEALTH

PRATT/MAHONARAN

Principles and practice of urban design within the comprehensive planning process. Emphasis on socio-cultural, economic, political and environmental determinants of form and pattern.

FALL 1978

* REL 495V

WORLD HUNGER AND DEVELOPMENT ETHICS

ROBILLIN/FRITSCHER

This course will examine relationships between environmental changes and the health status of the community. The strategy for this study relies upon (1) creating conceptual tools for understanding health, politics, and environment; (2) integrating these concepts into an analysis of specific comparative situations; and (3) developing policy and action orientations.

This course focuses on the question of food availability and its relationship to many complex human issues.

* Prerequisites required by department

For further information, contact:

ENVIRONMENTAL STUDIES PROGRAM

CRAWFORD 316 or 321 - PHONE 948-7361

PLEASE POST

CERTIFICATE IN ENVIRONMENTAL STUDIES

Introductory Summary Statement

In November 1976, the Environmental Studies staff submitted a proposal for the establishment of an undergraduate major in Environmental Studies at the University of Hawaii. A related aspect of the proposed major was the development of a certificate program in Environmental Studies.* In the proposal, we stated that the combination of a certificate program and undergraduate major would significantly broaden the scope of environmental education at the University of Hawaii-Manoa Campus, as well as meet student demands for broader options than those offered under the Liberal Studies "major equivalent." The certificate is intended to serve as a "minor" for those students who are majoring in other fields but who would like to add an environmental dimension to their education. At the same time, it will serve those students who want to accumulate practical experience in environmentally-related areas.

During the academic year 1976-77, the Environmental Studies staff has been discussing the various dimensions of a certificate program with different faculty members and students who are involved with our program so that we can determine the nature, demand, and feasibility of such an option. We have discovered that there is a strong interest in the certificate program, particularly among students majoring in engineering, geography, psychology, and political science. We are confident that with minor administrative staff increase, beyond that necessary for offering a major, we can offer a strong certificate program.

The main emphasis of the certificate program will be on providing our students a combination of basic environmental knowledge through course work as well as offering them some direct professional or pre-professional experience (internship) with government and private sector agencies. This emphasis will be incorporated in the program by offering a minimum number of introductory courses to familiarize the students with the fundamentals of natural and social ecology followed by an internship, practical training, or experience via a community and/or professional project. We have recently collected some data from environmental agencies and other employers across the country which indicate that the combination of environmental education and practical experience (e.g. voluntary activities, internship, or part-time job)--of the kind that we are planning to offer through a certificate program--is of particular advantage for future employment in environmental fields.

We have been involved since the beginning of this semester in coordinating a few projects for students who are enrolled with us through the Liberal Studies program. At the moment, we have students working on several different projects--one dealing with the environmental legislation on beverage containers, another producing an environmental movie on Steady-State economy, and several others studying various environmental bills and issues (e.g., noise, Hawaii General Plan). Currently, demands for greater options and services in the absence of our own major or a certificate program, are met through use of instructional and

*This proposal is an addendum to the original major proposal and won't repeat similar information.

Appendix G

PROPOSAL FOR A NEW INSTRUCTIONAL PROGRAM

College of Arts and Sciences
University of Hawaii-Manoa Campus

Proposal: A Certificate for the Environmental Studies Program

Submitted by: Dan Burhans, Assistant Director, Environmental Center
Associate Professor, Political Science

Date: October 24, 1977

APPROVED:

Dean, College of Arts and Sciences

Date

Administrative resources which are currently on loan from various departments and which will not last past the early development stages of the program.

Additional Comments on the Relationship of the Environmental Studies Certificate and Major (Proposed), and the Liberal Studies "Major Equivalent."

Listed below are several reasons we feel justify an expanded Environmental Studies program (Certificate and Major) beyond the UHM Liberal Studies current offering:

1. Liberal Studies offers a very necessary option for students at UHM who wish to design their own major, particularly within an environmental studies framework (e.g., environmental planning, natural resource management, forestry and recreation management, etc.). We expect that it will continue to attract a dozen or more students, with environmental related "major equivalents," who have special needs and for whom a major would be too structured.
2. The Environmental Studies Major and Certificate have a very different objective and constituency:

a. Students want a degree which represents their course of study--

a degree in Liberal Studies is not the same as a B.A. in Environmental Studies. (A survey from our office last year demonstrated that over 300 students expressed interest in becoming involved in an Environmental Studies program if it were expanded beyond a Liberal Studies "major equivalent.") In addition, graduate schools and employers in environmental fields give preference to students from environmental studies majors. Some 300 U.S. colleges offer B.A. curriculum in environmental studies (or equivalent) and over 100 have graduate programs.

b. If students are able to affiliate with a bonafide Environmental Studies program, they would have access to more specialized counseling and resources than they now receive through Liberal Studies. We are presently initially staffed with part-time assistance from other units which offer this support temporarily for development purposes.

c. Most Liberal Studies students come late to their environmental "concentration" (i.e., in Junior, sometimes senior year). This makes for difficult course alignment and background planning.

On the other hand, if we have a visible Environmental Studies major, students could declare their interest in their freshman or sophomore year and begin work on the introductory and survey courses, thus preparing them adequately for further specialization in the field in their junior and senior years.

3. The Liberal Studies major is based on the student "designing his own program." An Environmental Studies major would not be merely a collection of environmentally related courses drawn from other disciplines, but rather, its core will include foundations in environmental concepts, issues and solutions. This integration and cohesiveness is necessary to have a program which adequately serves the growing demand by

Environmental Studies has an identical relationship at a different period of time. The developing core of problems, concepts, research, and the community of scholars created by common interests is producing programs, centers, conferences, and funding sources. But the U.H. is currently at the trailing edge of this development, at least with respect to education, even though environmental problems are highly important to Hawaii and are given considerable recognition through government and media. The DOE is establishing environmental education programs to develop a cohesive program in environmental education. In addition, the State Legislature has given a mandate in Resolution HR 350 and SR 264 to expand the current environmental studies program beyond the Liberal Studies option.

4. A Certificate in Environmental Studies would offer a very useful option for students and be a strong addition to our program. Many of the Liberal Studies students in environmental concentrations (90 percent) are in the Social Science and Humanities areas. This is unfortunate for the program and the UH community, for environmental issues require some depth in the physical and biological sciences. With a Certificate, we feel the main attraction to our program would be from students who are majoring in the sciences (such as Botany, Zoology, Physics, etc.) who would seize upon the opportunity to relate their major to environmental problems and their solutions.

Also, the Environmental Studies Certificate Program might enable public employees working in the environmental area who may already have a B.A. (e.g., from Office of Environmental Quality Control, legislative aids serving individual legislators and legislative committees, State's specialized agencies and City and County employees, etc.) to receive recognition for additional work at UHM in their environmental specialty. Private sector employees, who hold posts as environmental liaisons with their companies and citizen groups or government, or those who conduct or consult on Environmental Impact Statements, could likewise pursue this certificate.

PROPOSAL FOR A NEW INTERDISCIPLINARY
ENVIRONMENTAL STUDIES PROGRAM

CERTIFICATE IN ENVIRONMENTAL STUDIES

The Environmental Studies Program offers a Certificate in Environmental Studies to undergraduates who complete certain requirements in addition to a regular major. The certificate requires an academic core of 15-16 credit hours in environmentally related courses which includes an "environmental skill." The courses and description of the "environmental skill" are listed below. The student must take one course (3 credit hours) from Category I; three courses (9-10 credit hours) from Category II; and one course (3 credit hours) from Category III.

Category I (Required) 3 credits

I.S. 210 (3) Introduction to Environmental Problems
(Pre: Sci 124 or Geog 101)

Category II Students are required to take 9 credits from the following courses, 6 credits in Part A and 3 credits in Part B. No more than one course may be applied to both the student major and Certificate.

Part A (6 credits total)
Choose two of the following:

Am St 320 American Environment

Am St 420 Man and Nature in America

Ed EF 497 Alternative Environmental Futures

Geog 309 Plants, Man and the Ecosystem

I.S. 261 Man, Ocean and the Environmental Crises

Po1 Sci 325 (Alpha) Topics in International Relations: International

Po1 Sci 365 (Alpha) Topics in Public Law and

Judicial Behavior: Pubs. of Environmental Health

Po1 Sci 110, 220, 230, 245, 270, or 271

Po1 Sci 110, 220, 230, 245, 270, or 271

Po1 Sci 110, 220, 230, 245, 270, or 271

* col = consent of instructor

MASTER OF ARTS IN POLITICAL SCIENCE

with

Concentration in Political Ecology

PROGRAM ELEMENTS

Members of this group now include: Fred Riggs, Dan Burhans, Kem Lowry, Bob Stautfer, Neal Milner, George Kent, Glen Shubert, and others. Other members of the department who have an interest in Political Ecology may be added to the group.

Guidance: Students in this program will be advised by a committee of three, at least two of whom must be members of the Department. The coordinator for the political ecology program will be the first person to advise each student, and will name a chairperson for the student's committee (in consultation with the student). The coordinator for the program will normally serve on each student's committee, for purposes of coordination, but will not be expected to chair any of the committees. The third member of the committee may be any faculty member of the University, whether or not a member of the Political Science Department.

Advisory Committee: A group of interested persons both in and outside the University will be recruited to serve as advisers to the program. Their help will be particularly important in identifying situations in which students can gain in field or "internship" type experience, and they can assist in opening up job opportunities for graduates.

Students should also attend the weekly Environmental Forum. Political Ecology Colloquium: A colloquium (not for credit) will be sponsored by the program from time to time (at least bi-monthly, preferably monthly) at which presentations can be made, followed by discussion, on issues relating to political ecology. Faculty, students, and members of the Advisory Committee would participate.

Courses of Instruction: The basic departmental requirement of 30 credit hours for Masters degree in Political Science provides the framework of the program. Of these, 15 may be in any political science courses of interest to the student, and the remaining 15 should be in courses with an ecological focus. The ecologically oriented courses fall in Category A; the other courses in Category B.

A. Category A courses: 15 credit hours

1. (3 credit hours)* Pol Sci 600 Introduction to Political Ecology. A new course to be planned collegially and taught in rotation by different members of the faculty group involved in this program.
2. (3-6 credit hours) Political Ecology general courses, each directed to a particular ecological level.

- *Pol Sci 324 International (global) environmental issues (Burhans)
- Pol Sc 346 Third World Issues (Riggs or Stautfer)
- *Pol Sc 385 Hawaii's Environmental Politics (Lowry)
- *Pol Sci 335 U.S. National Environmental Politics ()

Goals: To provide graduate training in political science for students interested in non-academic careers (i.e. not Ph.D. candidates) related to political and administrative problems that grow out of ecological issues. Conceptually, political ecology is concerned with the relation between decision-making systems at all levels (local, state, national, global) and their diverse environments (physical, biological, human cultural, and technological). More concretely, the program will focus on political and administrative processes and policies as they relate to such issues as the depletion and distribution of resources, pollution, the conservation and development of energy sources, population pressures and urbanization, ethnic conflict and turbulence, and appropriate technologies.

Constituency: The program is designed for anyone interested in environmental problems who wishes to prepare, through graduate study, for a career relevant to ecological issues. Hence, a broad diversity of background is anticipated, including students with an undergraduate degree in such fields as engineering, public health, planning, management, architecture, or agriculture, as well as liberal arts and social science majors and those who have already taken a major in environmental studies. Suitable arrangements can be made with the various professional schools of the University to take complementary programs leading to concurrent degrees, thereby enhancing their professional qualifications. In some cases it should be possible to reduce the total number of classes taken by counting required courses in one program as electives in the other.

Certificate in Political Ecology: Students who do not want to take the M.A. may qualify for a Certificate in Political Ecology by completing up to 15 hours of course work in the core subjects, plus carrying out a policy-oriented field project. Such projects would lead to the preparation of a report based on field experience and observations in which policy recommendations and means of implementation would be offered and defended. The certificate is intended for persons wishing to involve themselves in environmental politics at the practical level without feeling a need for the additional courses in political science required of M.A. candidates.

Organization: Several members of the Department are forming an "Ecology Group" which will:

1. continuously offer, by rotation if necessary, the core courses;
2. counsel students in the program within guidelines set by the Department; and
3. stimulate the growth of student and faculty interest in political ecology.

*These courses are new and would have to be developed and approved.

3. (3-6 credit hours) Elective courses in Political Science that are on a list of environmentally relevant offerings. The list should be reviewed and revised from time to time in the light of the changing interests and course offerings of members of the Department. Anyone wishing to have his course listed in this category should submit a proposal to the Ecology Group for consideration. Courses now offered which might be considered for inclusion in this list are:

- Pol Sci 375 (D) Ocean Politics (Kent)
- Pol Sci 398 Bio-Politics (Schubert)
- Pol Sci 325 (B) Coastal Zone Management (Kent/others)
- Pol Sci 371 Advanced Futuretics (Dator)
- Pol Sci 671 Public Policy and Law (Minner)
- Pol Sci 740 Multinationals (Stauffer & Heubauer)

4. (3 or more credit hours) Electives offered outside the department. Students may take any course offered in the University, with the approval of their committees. For illustrative purposes only, the following list has been taken from the catalog:

- Plan 614 Politics and Planning (Kent & Lowry)
Pre: Consent of instructor
- Plan 600 Planning Theory (Dinell)
Pre: Consent of instructor
- Plan 601 Planning Systems (Holmstrom)
Pre: Consent of instructor
- Pop 650 Intro to Demography
Demography Survey
Pre: 691
- Pop 750 Interdisciplinary Seminar
World Hunger and Development (Boblin)
Pre: 300 or consent of instructor
- ED EF 686 Environmental Education (Boyer)
- PH 681 Environmental Health
- PH 612 Ecological Concepts and Planning (Armstrong)
- Am St 610 Technology and Environment (Worster)
- Am St 710 American Environment Readings
Pre: Consent of instructor

Note: If not cross-listed with 600 level courses, graduate course credit can be earned for 300 level courses by negotiating with the instructor.

B. Category B courses: 15 credit hours

The selection of courses suited to the needs and interests of each student will be made on an ad hoc basis, in consultation between students and their committees. However, the following suggestions may be considered.

1. Some students will have had little or no instruction in political science prior to their admission to this program. They should take Political Science 600 in order to get a minimum foundation in the field.

2. Some students will not have received adequate instruction in statistical and other methodologies appropriate for ecological work. They should take Political Science 601 and/or 602.

3. Environmental levels. Each student will probably select an ecological level of concentration, i.e. Hawaii, U.S. National, Global (international), or Third World (developmental). This will affect the selection of courses in the second group of Category A. Supporting courses on the politics of Hawaii, the U.S. National, International Organization, or Political Development should be selected.

Field Experience: Some practical experience based on intensive observation and involvement in an activity related to environmental politics will be required of all students in this program. It should lead to the preparation of a report containing public policy recommendations. The Advisory Committee, and the Ecology Group in the Department, will suggest suitable opportunities, which should be selected by students in consultation with their committees. For credit purposes, a report will be considered the equivalent of a Master's thesis. The field experience will be carefully monitored and evaluated in order to make it more relevant, helpful, and feasible; and advice will be given to students on the preparation of their final reports.

- Plan 614 Politics and Planning (Kent & Lowry)
Pre: Consent of instructor
- Plan 600 Planning Theory (Dinell)
Pre: Consent of instructor
- Plan 601 Planning Systems (Holmstrom)
Pre: Consent of instructor
- Pop 650 Intro to Demography
Demography Survey
Pre: 691
- Pop 750 Interdisciplinary Seminar
World Hunger and Development (Boblin)
Pre: 300 or consent of instructor
- ED EF 686 Environmental Education (Boyer)
- PH 681 Environmental Health
- PH 612 Ecological Concepts and Planning (Armstrong)
- Am St 610 Technology and Environment (Worster)
- Am St 710 American Environment Readings
Pre: Consent of instructor

HAWAII ENVIRONMENTAL SIMULATION LABORATORY

By D.C. Cox, M.G.F. Bitterman, K.M. Bridges,
K.F. Brown, T. Dineil, G.L. Dugan, P.H.P. Ho,
J.C. Holmstrom, C.S. Papacostas, D. Runyan

Introduction

The Hawaii Environmental Simulation Laboratory (HESL) was initiated in 1971 as an ad hoc endeavor to contribute to the improvement of environmental planning and management. Begun by the Oceanic Institute and the University of Hawaii with Ford Foundation support, the endeavor has been continued since 1972 by the University alone, with major support from the RANN program of the National Science Foundation as well as the Ford Foundation and supplementary support in the form of smaller grants and contracts, mostly for specific purposes, from other agencies. Successes of the endeavor have now led to incorporation of HESL functions in the program of the Environmental Center of the University and requests for continuing underwriting by the State of Hawaii through the University Budget. These successes have resulted from the development of a broader range, and more intimate connections, with the environmental decision-making elements of the community than have usually been attempted by an academically-based endeavor. The development involved considerable evolution of the endeavor itself. Only a brief and selective discussion of the changes and their rationale, and of the results of the endeavor, is possible in this paper.

Optical and geographic focus

HESL's special interest, of course, has lain in the environment of the Hawaiian Islands. Its concern with the improvement of the planning and management of this environment has led naturally to a focus on those environmental aspects

that are most subject to human change and those changes that are of greatest human concern. The social environment has not been excluded from HESL's concern, but among social aspects emphasis has been placed on those in which natural geographic variability is of importance.

In order to demonstrate the value of the endeavor as rapidly as possible, HESL's initial efforts were focused exclusively on the watersheds tributary to Kaneohe Bay on the windward coast of the island of Oahu, across the Koolau range from the major part of the city of Honolulu. However, many of the models developed by HESL for the Kaneohe region are applicable in other parts of Hawaii and elsewhere, and some of HESL's more recent efforts have had no specific relationship to the Kaneohe region.

Technical activities

Although recognizing that improvements in environmental planning and management required a better understanding of the complex socio-ecological system overall, HESL early turned away from an attempt to model the entire system in the Hawaiian Islands, or even of the system of the Kaneohe region, to the analysis of subsystems that were most critical to the appraisal of the effects of greatest concern to the community and that might be anticipated from the implementation of plans already adopted or proposed, and potential alternatives.

Emphasis was placed on adaptation of existing models rather than development of new ones and use of existing data rather than collection of new data. The criteria of simplicity, as judged by potential users, and general versatility, as judged by experts, were substituted for the scientific criteria of accuracy and verifiability. In the use of the individual models for simulation, computer usage, although important, became incidental, and model linkages involving subjective judgments have been deliberately left open to user choice rather than computerized.

Community Interactions

To maximize the extent to which HESL's analytic efforts related to issues

considered important in the community, and the extent to which they would actually

be used in the decisions pertaining to those issues, great emphasis in the HESL

endeavor has been placed on interactions with the community through various existing

and ad hoc institutions.

A HESL Community Council, originally appointed by the President of the

University to provide overall policy guidance to the endeavor, transformed itself

into an autonomous, self-perpetuating body with a promotional as well as advisory

role. Except with respect to the Community Council, however, HESL found by experi-

ence that it was much more effective to work with existing community associations

and government agencies than to establish its own groups of persons influential in

decision making. Through its contacts HESL attempted to serve as an intermediary

between the associations and the agencies, bringing to the attention of the agencies

the concerns of the community and to the community associations the appraisals and

plans of the agencies.

Working especially with the technical staff of an agency, HESL had access to

the data and models the agency was using in planning and management decisions, and

in return could provide additional data supplied by the academic community, other

agencies, and its own limited field work, and model improvements and extensions to

which the staffs of HESL, the agency, and other agencies contributed.

HESL staff working with community associations served for a time almost as

staff members of these associations. However, it appeared impractical to establish

and maintain relationships with community associations throughout the entire state

as intimate as those it established in the Kaneohe region. Hence HESL established

a field office at the Windward Community College in the Kaneohe region, hoping that

this would be maintained by the Community College as an environmental resource

center and as a model for similar centers at other community colleges in the state-

wide University system.

Several environmental management games were adapted to Hawaiian conditions

and used in the community interactive effort, some of which have been further adapted

for continued use by other institutions.

HESL staff were largely responsible for the organization and operation of a

workshop, involving agency personnel and representatives of the concerned community,

to discuss the various proposals and implications for the future management of a

small area in the Kaneohe region that included a former Hawaiian fishpond, other

wetlands, and urban, resort, and park development potentials. The success of this

workshop led to HESL's subsequent involvement with workshops dealing with similar

planning problems in the Waipahu area of leeward Oahu and the Kona area of the island

of Hawaii.

Request response system

HESL found that much of the community need for environmental information was

site specific and required rapid response on the basis of existing knowledge

rather than extensive model development. To respond effectively to the need, but

also to avoid over commitment and to control the quality of the response, HESL

formalized a request response system.

All requests for information, however received, were logged in, and reviewed by

the staff managers. Each was classified according to its source, the nature and

extent of the response called for.

Any request that could be satisfied by HESL off-the-shelf information was

responded to without question and checked off. If a request was beyond HESL's

effective capabilities, it was turned down. If response could be provided more directly elsewhere, the requestor was advised where he could more effectively obtain the information he wanted. To respond to any other request, one that would require some diversion from or extension of on-going HESL technical developments, a task force was appointed. If the diversion or extension required would be substantial, the request was accepted only if substantial feedback to the HESL effort was anticipated or the requestor was willing to pay for the work entailed.

In total almost 600 requests were logged in. Only 6 percent of these were rejected, 47 percent were satisfied by off-the-shelf information, 29 percent by limited new work and 16 percent by substantial new work, and only 2 percent remain for which responses have not yet been prepared.

Although the request-response system diverted a good deal of effort from HESL's major analytic activities, it was considered extremely useful in assuring that the analytic activities related to and produced answers pertinent to the questions of community concern. Because responses to requests requiring more than off-the-shelf information involved HESL's usual interactions, the system resulted in better community understanding of agency problems and more extensive involvement of agency personnel with community concerns.

Major requests

Although HESL's activities themselves stimulated to some extent the concerns that led to requests for HESL information, many would have arisen independently. Requests related to some of these led to the production of some of HESL's more important reports to date.

During the period when the HESL endeavor was being planned, such concerns led the State legislature to call for the establishment of an Office of Environmental

Quality Control (OQC) in the Office of the Governor and the Environmental Center in the University. Both the OQC and the Center have contributed to HESL's development and requested HESL attention on specific problems. The results of HESL's Kanoehe modeling activities were, for example, consolidated in a report prepared at the request of the OQC (HESL, 1974).

A Temporary Commission on Environmental Planning, reporting in 1974, identified the concepts of carrying capacity and overload as critical concepts in environmental planning. To the development of these concepts HESL has contributed substantially, for example in response in part to a concurrent resolution of the 1974 Legislature (HESL, 1975) and a request from the OQC (Ho et al, 1976).

Such concerns, additionally, led to a 1973 legislative mandate to the State Department of Planning and Economic Development to take advantage of federal assistance in the Coastal Zone Management Program, and to the establishment by the counties of interim Special Management Areas as mandated by the Legislature in 1975. At the request of the Environmental Center, HESL contributed substantially to the development of guidance to the Counties in their establishment and management of these areas (Cox et al, 1975) and is now making the major contribution to the information systems and cartographic efforts of the long-term coastal-zone management effort, through the Pacific Urban Studies and Planning Program of the University.

Sedimentation modeling and its application

Among HESL's successes, perhaps the most easily demonstrable relates to the application of HESL's sedimentation hazard model. This model is based on a Soil Conservation Service model relating soil loss to rainfall, soil type, slope, vegetation cover, and control practice. In the HESL model, sediment produced is considered to have a combination of rate- and quantity-dependent effects in several local

will deal with watershed management, transfer possibilities, and HESL's future. More important than these tangible products has been the greater understanding involved in environmental decision making resulting from HESL's activities, although the thorough documentation of HESL's contribution can never be expected. The best demonstration of HESL's influence lies in the request for and use of HESL information by a variety of parties to a number of controversies, large and small, that have arisen in the Kaneohe area--not infrequently by parties taking opposite sides on the same issue. HESL's contribution to the understanding may be characterized as two-fold: a) the distinction between the objectively estimable impacts of alternative decisions and the subjective evaluation of those impacts; and b) the provision of some of the pertinent objective estimates. Significant abatement or limitation of some of the controversies appear to have resulted from HESL's contributions, but in most the effects of the contributions have been simply a better focus on the subjective value judgments.

References

Bitterman, M.G.F., 1976. A History of the Hawaii Environmental Stimulation Laboratory. Hawaii Environmental Stimulation Laboratory.

Cox, D.C., P. Bartram, and Susan Holt, 1975. Special Management Area Boundaries and Guidelines under the Shoreline Protection Act. Univ. Hawaii Environmental Center, SR:0009, 82 pp.

HESL, 1974. Kaneohe Alternatives: an application of impact methodology. Hawaii Environmental Stimulation Laboratory, 114 pp.

HESL, 1975. Carrying Capacity Analysis in Context. Hawaii Environmental Stimulation Laboratory, 49 pp.

Ho, P.H.P., C.S. Papacostas, and J. Holmstrom, 1976. Systems and Methodologies for Carrying Capacity Analysis in the Hawaii Study: An Illustration. Hawaii Environmental Stimulation Laboratory, 90 pp. (plus appendices)

Kloos, B., and Dean Runyan, 1976. Improving Planning through Methodological Research. Hawaii Environmental Stimulation Laboratory.

Ratings, weightings and simplifications on the basis of best available information (rare expert opinion in some cases) produced a simple formula by which what was termed sedimentation hazard could be estimated for a particular grading project, depending on terrain and climate, location, duration of disturbance, and practices to be used.

HESL pointed out that a standard in terms of maximum permissible sedimentation hazard would imply, through the use of the formula, an appropriate limitation of combinations of grading practice and duration of disturbance; and that such a standard, though single valued, would combine desirable aspects of site dependency and developer choice. The Department of Health has incorporated just this novel kind of performance standard and the HESL formula in its sedimentation regulation, and each of the Counties had adopted corresponding grading ordinances.

In addition to assisting the Counties in the drafting of these ordinances, HESL has prepared handbooks for each county providing instructions on the use of the sedimentation hazard formula, compilations of necessary input data, and a means for screening proposed projects so as to focus greatest attention on those that have the potential for the most severe impacts.

Products

The tangible products of the HESL endeavor include several maps of the Kaneohe region, several hundred memoranda of various lengths responding to requests, about 26 status reports, about 40 working papers, several degree dissertations, several progress reports, and some more formal publications, including those to which reference has been made as examples, whose number is still incomplete. Several of the status reports and working papers were regarded as drafts to be used in and revised through community interactive processes. The more important of these are now being recast as technical reports for wider distribution. Two of these have now been issued. Two of the final reports due under HESL's foundation grants deal with HESL's history and the interactive process (Bitterman, 1976; Kloos and Runyan, 1976). Others in preparation

ENVIRONMENTAL CENTER RESEARCH

A. Projects undertaken or coordinated by Environmental Center

Project	Principal Investigator(s)	Dates	Role of Environmental Center	Administrating unit if not Environmental Center	Other Cooperating Units	Grants to or contracts with Environmental Center, \$	Products*
Mirex monitoring	D.C. Cox J.M. Johnson	1972 1974	Coordination	Agricultural Biochemistry Water Resources State Dept. Agriculture			SR:0011 SR:0012 CN:0009 CN:0010
Air pollution effects of agricultural field burning	A. Daniels	1973 ----	Coordination	Meteorology			Progress reports
Pacific tsunami catalog	D.C. Cox	Oct 1973 Jul 1977	Staff	HIG	Botany Internat. Tsunami Info. Ctr. Nagoya, Japan Sakhalin, USSR		Progress reports
Carrying capacity	K. Lowry	Jul 1974 Jan 1975	Coordination	HESL		2,867	HESL report
Soil creep	P. Bartram M. Jellingner	Jul 1974 Jul 1977	Coordination	HESL		1,632	Ms report and dissertation
Special management area under Shoreline Protection Act	D.C. Cox	Jun 1975 Sep 1975	Administration & staff	HESL			SR:0009
Steady State Economy	A.D. Burhans	Jun 1975 Jun 1976	Staff		Political Science		CN:0015

Project	Principal Investigator(s)	Dates	Role of Environmental Center	Administrating unit if not Environmental Center	Other Cooperating Units	Grants to or contracts with Environmental Center, \$	Products*
Ala Wat Canal Improvement	J. Waters P.F. Fan J.N. Miller	Aug 1976 Dec 1976	Administration & staff	Oceanography HIG		5,789	SR:0016
Pearl Harbor Dredge Spoil Disposal	J.N. Miller K. Chave	Jun 1976 Jan 1978	Administration & staff	Oceanography		82,117	SR:0017 SR:0018
Ecology and the Third World	A.D. Burhans	Jun 1976 Jan 1977	Staff	Political Science			SR:0013 CN:0013
Costs of tsunami false alarms	D.C. Cox	Dec 1976 Jan 1977	Administration & staff	State Civil Defense			SR:0013 CN:0016
Local tsunami history	D.C. Cox	Feb 1977 Dec 1977	Staff HIG	Geography			HIG rept in press CN:0017
Performance of State EIS System	D.C. Cox	Jul 1977 Jan 1978	Administration & staff			5,000	Env. Ctr. report in progress CN:0017
Doing less better	A.D. Burhans	Jan 1977 Jun 1977	Staff	Political Science			

*For identification of numbered products see list of formal products, Appendix

B. Projects Supported by Environmental Center Special Project Funds

Principal Investigator	University Unit	Project	Dates	Grant, \$	Product
Mittler, John	HIMB	Ecology of fish eggs & larvae	Mar 73 Jan 74	2744	HIMB report
Fujitoka, R. & G. Rutter	Microbiology	Virus in water environment	May 74 Dec 75	2000	Master's thesis
Cheyney, D.P.	H110	Growth in corals	May 74 Nov 75	1948	Manuscript report
Hermes, D.P.	H110	Invertebrate populations, Keahou Bay	May 74 Apr 74	1230	Manuscript report
Chan, J.G.	H110	Atypid shrimps as indicators	May 74 Jun 76	1300	Manuscript report
Muller, Pamela	Oceanography	Sediment production by foraminifera	Jul 74 Jan 75	2328	PhD dissertation
Young, Reginald	WRRC	Subsurface disposal of waste water	May 74 Dec 74	2000	Manuscript report
Woodard, W.T.	Sensory Sci	Biossay using conditioned response of fish	May 74 Aug 76	1900	Manuscript report
Anderson, Donald	Ed Fndns	Film project	Apr 74	325	Incomplete
Preble, D. & A. Summarstrom	Art	Leahi case study	May 74	2000	Manuscript in preparation
Young, M.W.H.	Public Health	Choramine & chlorinated effluent effects	Apr 75 Sep 76	500	Dissertation
Saboski, Eleanor	Botany	Diatom morphology & metallic ions	Apr 75 Nov 75	910	Manuscript report
Stiegel, S.M. and B.Z.	Botany	Mercury deposition on metallic soils	Apr 75 Jul 76	280	Manuscript report
Rochiv, J.	Geography	Satellite image enhancement & Ohia decline	May 75 Nov 76	658	Dissertation pending
Takahashi, P. & R. Barber	Civil Engr	Quantification of intangible environmental issues	Jun 75 Apr 76	500	Manuscript report
Rezacek, David	Oceanography	Heavy metal in Stolephorus purpuraceous		1000	Grant proposal
Stiegel, S.M. & B.Z.	Botany	Environmental montory equipment		805	Equipment purchased
Massey, Jane	Botany	Physico-chemical study of Lake Waiata	Dec 77	800	Dissertation in progress

U.H. Environmental Center

POLICY GUIDELINES ON SERVICES

To assure that, in the provision of its services to the community external to the University, the Environmental Center exercises due responsibility:

1. The Center will address itself to those issues, potential issues, or parts thereof, that are amenable to objective analysis and will avoid making recommendations which involve essentially subjective value judgments except when there is a clear public consensus as to such judgments.
2. In the preparation of any Center statement on an issue or potential issue, to the extent permitted by time limitations, the Center will invite wide participation from the University community and will actively solicit contributions from those members of the community that appear most knowledgeable about the issue addressed.
3. To the extent permitted by time limitations, the Center will attempt to reconcile differences of opinion expressed by contributors to a Center position by identifying and expressing as alternatives any subjective value judgments that may underly the differences. If reconciliation is not possible, the Center will express the divergent points of view and identify them with their respective holders.

4. Any statement of information or advice provided by the Center will be identified with the Center and the contributors to the statement and will include a disclaimer that the statement represents an official position of the University or any other institution.

5. The Center will provide its information and advice on any issue to whatever government agency or legislative body or combination of agencies and bodies have official responsibilities for dealing with the issue involved. All information produced by the Center must be made available to the public. However, when addressing a problem that may become but is not yet a public issue, the Center will endeavor to allow time for official response before making its information available to the general public.

6. To interpret these guidelines, to establish Center policies generally, and to assure that the Center administration adheres to these guidelines and established policy, the Center administration will be guided by a Policy Committee. The members of the Policy Committee are to be appointed by the Hanua Chancellor* to obtain broad representation from the colleges and campuses of the University. The Director of Environmental Quality Control is to be, ex officio, a member of the Policy Committee.

Approved May 1976

*Effective 1976-77, the Director of Research makes appointment to the Policy Committee.

Formal Environmental Center Products

Reviews	1970-71	1971-72	1972-73	1973-74	1974-75	1975-76	1976-77	1977
Legislation (RL)	24	30	20	30	47	40	62	1
Regulations (RR)	1	3	8	4	11	17	6	2
Variances (RV)	1	13	5	5	9	6	5	4
EIS's (RE)	12	52	29	28	52	29	23	12
Neg. Declaration (RN)				6	6	15	2	2
General (RG)	2	5	3	4	8	6	8	2
<u>Other Products</u>								
Special Reports* (SR)	2	4	2	1	1	1	2	1
Contributions* (CN)	1	5	2	0	0	3	3	1
Audio-visuals (AV)				1	1			
Addresses (AD)	6	3	3	2	2		1	

Environmental Concern at the University of Hawaii 1970, rev. 1973, 1974, 152 pp.

Hawaii Environmental Laws and Regulations (with annual revisions)
 Vol. 1 Laws
 Vol. 2 Regulations

*See listing on following sheets.

Special reports

<u>No.</u>	<u>Author(s)</u>	<u>Title</u>	<u>Date</u>	<u>Pages</u>
1	Cox, D.C.	Establishment of a University of Hawaii Environmental Center	Sep 1970	8
2	Task Force Air Pollution	Recommended air quality standards for Hawaii	Jan 1971	7
3	Cox, D.C. Lau, L.S.	Detergent phosphates in Hawaii	Jul 1971	15
4	Johnson, J.M. Webb, S.	Aerosol hazards from sewage treatment plants	Aug 1971	4
5	Cox, D.C.	The meaning of "best practicable treatment or control" in the Hawaii Water Quality Standards	Sep 1971	7
6	Johnson, J.M.	Environmental Center Task Force staff paper concerning Manoa Campus health and safety problems	Dec 1971	11
7	Johnson, J.M.	Observations and recommendations in relation to pollution in Hanamalu Watershed and Bay	Oct 1972	3
8	Cox, D.C. Dugan, G. Young, R. Bardach, J. Johnson, J.M.	Environmental rationale for exempting over ocean discharges from Pacific Islands from secondary-treatment requirement for municipal wastewaters	Aug 1973	3
9	Cox, D.C. Bartram, P. Holt, S.	Special Management Area boundaries and guidelines under the Shoreline Protection Act	Sep 1975	82
10	Cox, D.C.	Applicability of the EIS system to University research projects	Aug 1976	37

No.	Author(s)	Title	Date	Pages
11	Cox, D.C. Bevenue, A. Okubo, W. Dollor, A.	Mirex monitoring in Hawaii Final report, 1972-73	Aug 1973	50
12	Johnson, J.M. Dollor, A.	Mirex monitoring in Hawaii Final report, 1973-74	Sep 1974	47
13	Cox, D.C.	The costs of tsunami false alarms in Hawaii	Jan 1977	13
14	Cox, D.C.	Tsunami hazard at proposed sites for Kalaupapa Infirmary, Molokai	Oct 1977 Nov 1977 Suppl.	8
15	Burhans, D. Ahmed, R.	Bibliography: Social and Natural Environment	May 1977	
16	Cox, D.C. Miller, J.N. Walters, J.F. Far, P.F. Miller, G.R. Chave, W. Wheatcraft, S. Billis, D.	Improvement of the Ala Wat Canal	Dec 1977	173
17	Chave, K. Miller, J.N. Moberly, R. Char, A. Walters, J. Chave, E. Allen, M.	Physical, chemical and biological characteristics of nearshore dredge spoil disposal, Pearl Harbor, Hawaii Part A. Baseline studies, investigation, and selection of a suitable dredge spoil site	May 1977	154
18	Ibid	Ibid: Part B. Immediate effects of dumping monitoring studies	Dec 1977	125

Contributions

<u>No.</u>	<u>Author(s)</u>	<u>Title</u>
1	Cox, D.C.	Indicators of pollution and pollution effects
2	Cox, D.C.	Pollution of Pearl Harbor
3	Cox, D.C.	Environmental Standards
4	Cox, D.C.	Waste disposal--wasteful and otherwise
5	Cox, D.C.	Research and development and Hawaii's environment
6	Cox, D.C. Johnson, J.M.	Environmental impact statements for better governmental decisions
7	Cox, D.C.	The best practicable control of environmental discharges
8	Cox, D.C.	Energy, the Ultimate Environmental Problem--Summary

Dept. Planning & Econ. Dev.	Proc. Conf. on Socio-Environmental Indicators	March 1971, pp. 131-142
Env. Prot. Agency	Proc. Pearl Harbor Pollution Control Enforcement Conf.	September 1971, pp. 275-297
Hawn. Sugar Technologists	Proc. 30th Annual Conf.	November 1971, pp. 130-134
U.H. Ctr. for Engr. Res.	Proc. Solid-Waste Disposal Conf.	January 1972, pp. 53-61
Dept. Planning & Econ. Dev.	Proc. Conf. Role of Research and Development	March 1972, pp. 27-31
Development News	Vol. 3, No. 2, pp. 8-9, 1972	
Hawn. Sugar Technologists	Proc. 31st Annual Conf.	November 1972, pp. 58-74
U.H. Ctr. for Engr. Res.	Summary Proc. Environmental Conf. on Public Understanding of Science	April 1973, pp. 92-99

No.	Author(s)	Title
9	Johnson, J.M. Dollar, A.M. Cox, D.C.	Mirex monitoring in Hawaii--a cooperative venture
10	Johnson, J.M. Dollar, A.M. Cox, D.C.	Mirex monitoring in Hawaii--monitoring requirements
11	Cox, D.C.	Notes on Hawaiian sand beach management
12.	Cox, D.C.	"Geological Hazards" by Bolt, Horn, Macdonald and Scott (Review)
13	Burhans, A.D.	Ecology, the third world and the steady state
14	Cox, D.C. Morgan, J.	Local tsunamis in Hawaii
15	Burhans, A.D.	Steady State Economy
16	Cox, D.C.	Costs of tsunami false alarms
17	Burhans, A.D.	Doing less better: Reviving the arts of make-do and maintenance
		The Futurist In press
		Marine Geodesy In press
		Center Magazine January 1976
		Hawaii Inst. Geophysics Tech. Rept. in press
		Impulse Magazine (East West Center) Spring 1977, Nos. 45-47
		Technonophysics Vol. 33, pp. 211-213, 1976
		December 1975, 21 pp. Technical sample Program
		Hawaii Coastal Zone Management Program
		Pacific Urban Studies & Plan. Prog. Hawaii Coastal Zone Management Program
		Jour. Env. Health Vol. 38, No. 5, pp. 343-344, 1976
		Jour. Env. Health Vol. 38, No. 4, pp. 254-255, 1976