

**A NATIONAL SURVEY OF FISHERY EDUCATION  
IN INSTITUTIONS OF HIGHER EDUCATION**

Rose T. Pfund

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**Sea Grant Miscellaneous Report**  
**UNIHI-SEAGRANT-MR-85-02**

May 1985

**UH Sea Grant College Program**  
**Honolulu, Hawaii**

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by

Rose T. Pfund

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### **ABSTRACT**

Data provided by 50 institutions of higher education indicate that there is a wide variety of fishery and fishery-related educational programs distributed throughout the United States. With present facilities, faculty, and operational funds, most of the institutions responded that their programs are responsive to both student and industry/employment needs. However, more than 50 percent of the institutions project expansion in faculty recruitment, facilities, and equipment.

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## INTRODUCTION

Perhaps the most comprehensive survey of fishery education was done by Yasso (1980).<sup>1</sup> The report summarizes the results of the work of a study group convened under the auspices of the National Sea Grant College Program. Yasso noted the "sad fact that few solid data exist upon which to build a quantitative foundation for [his] study." The Yasso report is therefore based on "limited data, anecdotal reports and foreign examples" (p. viii). The "validity of the study" is, therefore, drawn from the personal experiences of the study group and others who provided anecdotal information.

Even with these limitations, and further limitations attributable to lack of depth and age of the data used (all literature used were published in the early or mid-1970s), the Yasso report provides a useful documentation of the available data and perceptions of some well-recognized experts in the field of fishery education and active participants in the fishing industry.

The report (Yasso, 1980) identifies several programmatic needs:

1. Vocational technical programs, primarily to provide inservice training to upgrade skills of workers
2. Associate degree programs to educate and train new entrants to the industry, or for further education
3. Bachelor through doctoral degree programs to produce fishery industry specialists

An educational infrastructure, which includes all levels, was cited as a way for achieving these goals. The report placed high priority on inservice training and associate and other degree programs for new entrants to the industry.

The report (Yasso, 1980) recommended federal funding for the following:

1. To create or upgrade at least one associate degree program on each of the three coasts - East, West, and Gulf
2. To create or upgrade at least two departments or schools of commercial fisheries, one on the East coast and another on the West coast, which will offer bachelor and higher degree programs
3. To provide an integrated, three-tiered educational system (vocational-technical, associate degree, and

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<sup>1</sup>In addition, David Dow surveyed selected universities' marine extension programs (PhD dissertation). David Dow, 1984: personal communication.

- bachelor or higher degree) which facilitates re-entry at any time
4. To build a flume for fishing-net demonstration and research purposes at one of the advanced-level fisheries departments or schools and to establish a fishery electronics research and demonstration facility at the other

The study group apparently was unaware of the extent of the fishery education programs currently available in the United States. In light of the wide menu of programs which are currently being offered across the nation, it is unlikely that the study group would have identified, as high priority, the four items recommended above. The data obtained by the present study, together with the needs assessment identified in the Yasso report, provide a rational basis for planning and developing fishery programs. Thus, the descriptive data on the state of the art of the national fishery educational sector, which follow, are the critical ingredient required for advocating future policies on fishery education in the United States.

This report on the results of a national survey, conducted in 1984, primarily presents a broad statistical overview of fishery education programs in the United States, rather than catalog-type detailed information of individual programs.

A list of 108 private and public institutions was compiled from names obtained from two sources: a directory of higher education institutions and the directors of Sea Grant programs. Of the 67 questionnaires returned, 17 were not included in this study because the respective respondent indicated that the institution did not have a fishery education program or sufficient number of courses to constitute a program. The remaining 50 institutions, which contribute the sample group, range in size from those with student enrollments below 5,000 to those with more than 25,000. As such, this is probably the most comprehensive survey to be conducted on fishery education in institutions of higher education in the United States. The list of institutions whose responses are included in the statistics is given in Appendix A.

Two generic problems were encountered in this study:

1. Most programs do not differentiate between freshwater and saltwater fisheries
2. Many institutions offer a focus in fisheries but not a fisheries degree

The first problem was resolved by including all fisheries programs without attempting to categorize them. If programs which include freshwater species were deleted, only two or three academic degree programs and the technical training programs in

community colleges or technical schools would remain. Aquaculture programs are also included because of the historic antecedents of fishery management in the United States which were centered on fish culture and stocking.

The second problem was not as easily resolved. Although most responses clearly showed the existence of a fishery education program, some were not so clear. When responses fell into the latter category, the individual who filled out the questionnaire was called to render a judgment on whether or not a bona-fide fishery education program existed in the institution. If the individual was not available, another knowledgeable person was contacted. Hence, the determination of whether an institution had a program or not was made by a representative of that institution.

### ANALYSIS OF THE DATA

The statistical analyses which follow were done with sub-programs of SPSSX, FREQUENCIES and CROSSTABS (SPSS, Inc., 1983).

#### Institutional Demographics

Figure 1<sup>2</sup> indicates that there is generally a good national distribution of institutions which offer fishery education programs, particularly on the East and West coasts. (Also, see map in Appendix A.) The West coast has 16 institutions which have fishery education programs; the East coast has 20 programs; the central region, including the Great Lakes and inland states down to the Gulf, has 13 programs; and the Caribbean has 1 program. Whereas it is highly probable that programs in the four land-locked institutions in the central region have a freshwater fishery focus, most coastal institutions do not have programs which separate saltwater from freshwater fisheries.

A substantial number of fishery and fishery-related educational programs (62 percent) are offered by state and land grant institutions (Figure 2). The figure rises to 90 percent when all public institutions are included. About 30 percent of all fishery education programs are in institutions with student enrollments of less than 5,000, but nearly 25 percent are in institutions with more than 25,000 students. The distribution median of institutional size is in the 10,001 to 15,000 range (Figure 3).

A variety of informal and degree programs are offered by the 50 institutions. Nine institutions offer the full range of informal programs to advanced degrees; 10 institutions offer a

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<sup>2</sup>All figures are provided in Appendix B.



range of degrees from bachelor's to PhD; 14 institutions offer only advanced degrees (Figure 4). About 50 percent of all programs enable students to complete advanced degrees at the master's or PhD level.

The distribution median of in-state students enrolled in fishery education programs is in the 16 to 20 range. However, more than 25 percent of the institutions have more than 40 students enrolled in their fishery program (Figure 5). Of the 46 institutions that have out-of-state students, 28 (60 percent) have between 1 and 10 students (Figure 6). Figure 7 shows that 21 institutions have foreign students. Most of these institutions [16 institutions (76 percent)] have between 1 and 5 foreign students each.

### **Overview of the Fishery Education Programs**

Distribution of funding for the past 5 years is shown in Table 1.<sup>3</sup> Of institutions which provided data on their operational funding level, the mode indicates that a substantial number of the programs have close to \$.5 million budgets. Several reported annual budgets of over \$2 million. However, the latter figure includes larger programs of which fishery education is only a component.

During the 5-year period from 1980 through 1984, about 15 percent of the institutions received funding for fishery and fishery-related programs which totaled more than \$400,000, while 20 percent received less than \$200,000. During the same period 6 institutions (12 percent) received project funding ranging from less than \$10,000 to more than \$400,000 from other sources.

Major funding sources for fishery education include:

1. State
2. Federal
3. Private

Thirty percent of the institutions receive funds only from state sources; 34 percent from a combination of state, federal, and private sources; and 26 percent from state and federal sources. The balance receive funds from the university and a combination of public and private sources (Figure 8).

Table 2 shows that about 65 percent of fishery education is focused on fishery biology and wildlife and resource management (the latter with a fishery focus). The balance is focused on informal and vocational programs, e.g., processing, gear, or fishery technology programs.

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<sup>3</sup>All tables are provided in Appendix C.

About 50 percent of the institutions house their fishery education programs in either the biology or the forestry, fishery and wildlife departments or schools (Figure 9). There are, however, four departments or schools of fisheries.

Faculty involved in the teaching of fishery courses have divergent specialties ranging from biology to law and economics. Among other specialties, faculty of most institutions have competence in fishery and marine biology, limnology, vertebrate and invertebrate zoology, ichthyology, systemics, morphology, aquatic ecology, entomology, wildlife and fishery management, modeling and biometrics, hydrodynamics, engineering, seafood technology, economics, policy and management, aquaculture, physiology, genetics, microbiology, and pathology. Survey results show that there are generally between one and five faculty members in any given disciplinary area in an institution.

Twenty-nine institutions have advisory committees of some kind for their fishery or fishery-related programs. Only six of these are all-faculty committees. The rest are combinations which include fishermen, resource managers, etc. (Figure 10).

### **Regional Distribution of Institutions and Fishery Programs**

Tables 3 and 4 present regional distribution by types and size of institutions, respectively. Although most fishery education programs are offered by coastal state and land grant institutions, there is a good distribution of institutions of various sizes throughout the nation. Regional distribution of degree and informal programs is shown in Table 5. Eastern institutions offer a wider variety of programs than western institutions. Table 6 shows that there are three institutions which have both technical programs and academic programs (Northeast and Great Lakes). For the most part, technical programs are located in the northeastern (7) and northwestern (5) regions. The academic programs (fishery biology and resource management) are widely distributed on both coasts and inland states, but are concentrated in the southeast (10).

### **Regional and Institutional Distribution of Students**

In-state students (53 percent) are concentrated in the Eastern and Great Lakes institutions (Table 7). Fourteen institutions have more than 40 students, but only five are located on the West coast. The balance is distributed in the eastern half of the United States. Of the 46 institutions which indicated that they had out-of-state students, 18 are eastern institutions and 7 are Great Lakes institutions (Table 8). Hence, out-of-state students are concentrated in eastern institutions. However, only eight institutions, with enrollments ranging from 21 to more than 40, appear to serve most of the out-of-state students. Five of these institutions are located in the Northeast

and 3 in the Northwest. Foreign students appear to be concentrated in the Northwest and Eastern and Great Lakes institutions (Table 9).

Tables 10 and 11 indicate that most American students are enrolled in 10 state and 18 land grant colleges; Table 12 indicates that most foreign students are enrolled in 8 state and 9 land grant colleges.

### **Institutional Size and Programs**

Generally, the size of the institution has an influence on the program offering (Table 13):

1. Smaller institutions with student enrollment of less than 25,000 offer both informal non-degree programs and bachelor's and master's degrees.
2. Institutions with student enrollments of over 25,000 offer the full range of degree programs up to the PhD level: six offer informal and full range of advanced degrees; four offer bachelor's, master's, and PhD degrees; one offers bachelor's and master's degrees, and another offers only graduate degrees.

### **Mean Scores of the Institutional Self-evaluation**

Respondents were asked to evaluate their program on a 7-point Likert-type scale (1=low to 7=high). Mean scores of the responses to the seven questions follow:

1. Adequacy of program response to student needs  
Mean 5.2            S.D. 1.3
2. Adequacy of program response to current employment needs  
Mean 5.0            S.D. 1.7
3. Adequacy of response to future employment needs  
Mean 5.2            S.D. 1.5
4. Adequacy of existing facilities  
Mean 4.4            S.D. 1.5
5. Adequacy of existing staff  
Mean 4.7            S.D. 1.5
6. Adequacy of operational funds  
Mean 3.5            S.D. 1.4
7. Adequacy of response to fishing industry needs  
Mean 4.5            S.D. 1.8

The results of the self-evaluation appear to be fairly conservative. The small standard deviation scores, with the possible exception of questions 2 and 7, appear to indicate that the mean scores can be accepted with a reasonable degree of confidence.

### **Program Expansion Projections**

Twenty-eight institutions, distributed in all 8 regions, indicated future expansion in fishery education (Table 14). Programmatic growth appears to be centered in the northeastern, southeastern, and the northwestern regions. Sixteen of these institutions plan to make some modifications to their existing facilities. Eight indicated that they plan to expend more than \$65,000; 7 did not indicate the amount of their projected capital outlay (Table 15). The building of new facilities is being planned by 13 institutions in 8 regions; 4 will spend more than \$65,000; and 8 did not specify the amount of their capital expenditures (Table 16). Most initiatives for new facilities are in eastern institutions.

New equipment purchases ranging from less than \$5,000 to more than \$65,000 are being planned by 29 institutions in 8 regions (Table 17). Six institutions expect to acquire fishing vessels (Table 18).

Staffing expansion is contemplated by 21 institutions, which are located in all regions (Table 19). Of these, 16 institutions (76 percent) expect to add one or two faculty to their fishery program staff. One institution expects to expand its staff with six new faculty.

Thirteen institutions in five regions are planning to add new courses to their fishery program (Table 20). There does not appear to be a relationship between new faculty and new course additions.

Most of the impetus for programmatic expansion originated internally within the institutions. Fifteen institutions (44 percent) indicated that the initiative for expansion was institutionally motivated; 16 institutions indicated that in addition to the institution, there were exterior influences, including fishing interests, legislators, and students (Figure 11).

### **CONCLUSIONS**

Fishery education programs in the United States, at least for the present, adequately serve students needs and appear to be in good health. Fifty institutions, widely distributed and offering a variety of fishery and fishery-related educational programs, provide diverse vocational and professional options. With programs located in nearly every coastal and Great Lakes

state, a choice of options is relatively accessible to most students.

The self-evaluation of the programs by a knowledgeable individual, the questionnaire respondent, indicates that the programs are responsive to student and industry/employment needs. The adequacy of existing staff and facilities was rated about one point above the mean of the 7-point interval scale. Hence, there is general agreement that the "tools" to maintain programs at current levels are adequate and that future employment needs can be met. The only relatively low score was for the adequacy of operating funds (score=3.5). The wide range of the respondents' response to the questions, as shown by the standard deviation scores, on the adequacy of their program's ability to meet current employment and the future needs of the fishing industry appears to indicate an unevenness in the adequacy of one or a mixture of operational funding, staffing, or facilities.

With most of the impetus coming from the institution itself, about 56 percent of the institutions (28) projected future expansion (Table 14). These institutions, located in all eight regions, project expansion in a variety of areas, including new courses and staffing increases, as well as facilities renovation and additions. More than 50 percent of the existing programs, therefore, appear to be vital and growing, albeit at unequal levels of vigor. The institutions which currently offer fishery education programs apparently are those which have survived the tests of time and the vagaries of funding.

### **RECOMMENDATIONS**

This survey served a "prospecting" function of identifying extant fishery education programs in the nation. The data indicate that there are some vigorous programs which are meeting student needs and have established the necessary linkages with extramural interest groups and the fishing industry. To maintain and enhance fishery education in the United States, the following recommendations are offered.

#### **Recommendation 1: A national consortium for fishery education be established**

The lack of lateral programmatic linkage hampers the establishment of a national identity and legitimation of fishery education. There appears to be a singular lack of knowledge of other fishery programs by the institutions and their representatives. Although local and state funding are important sources to about 30 percent of the institutions, 32 institutions (64 percent) rely on federal funds to provide some part of their operational expenditures. Hence, federal funds make a significant contribution to fishery education programs. Continued funding over the long term will require "lobbying" -- an activity which requires a broad-based national interest group.

A national consortium for fishery education can be established in two ways:

1. As an independent network
2. Under the auspices of the Marine Division of the National Association of State Universities and Land Grant Colleges (NASULGC)

The first option is feasible because of the number and standing of the institutions which have fishery programs. Since many have an office in Washington, D.C. to bird-dog other federal higher education legislation, a small contribution from each institution would be sufficient to enable one of these offices to track legislation which support fishery education. In addition, linkages with the fishing industry, not well-connected at present, should be developed. This private sector support can be an important part of developing a national lobbying network and to legitimize the consortium.

The second option proposes the use of a well-established and recognized infrastructure. The Marine Division of NASULGC has a Fishery Education Committee which can be restructured to represent its constituency more accurately. The identification of the institutions which have fishery education programs now makes it possible to select committee members from these institutions. The executive committee of the fishery education consortium can serve as the NASULGC Fishery Education Committee. Beyond such practical concerns as economics (savings on costs of holding meetings, etc.), the viability of the Marine Division Fishery Education Committee will be assured because of the vested interest of the participants. Furthermore, any lobbying activity can be carried out by the NASULGC lobbyists.

**Recommendation 2. The Marine Division of NASULGC coordinate a national student exchange agreement for fishery education**

The extant fishery education programs can be made accessible to students by waiver of out-of-state tuition for students who come from states which do not have such programs. The proposed exchange agreement will discourage proliferation of inadequately funded programs and enhance the maintenance and vitality of existing programs. Furthermore, educational equity will be ensured by non-discriminatory tuition rates.

**Recommendation 3. The Marine Division publish a national prospectus on fishery education programs in the United States**

A description of the national capability of the United States for providing technical and professional education and training in fisheries will be both useful and impressive. The present study found that fishery education is an important component of marine-related education and training, but it has not

been identified as a programmatic area except in a few institutions. Hence, it is apparently not widely recognized as a legitimate program focus in institutions of higher education. A national prospectus on fishery education will contribute to the process of legitimizing fishery education programs in the United States.

**Recommendation 4.** An in-depth study of fishery education programs be conducted under the auspices of the Marine Division of NASULGC to assess near-term and long-term national needs, based on private- and public-sector projections, and the capability of the extant programs to meet those needs.

The 50 institutions identified by the present study already provides some baseline data which can be used as the starting point for the proposed study.

#### **ACKNOWLEDGMENTS**

The cooperation of the respondents of the survey questionnaire and the responding institutions is gratefully acknowledged. Without their willingness to provide the information requested, the survey would not have been as complete as it is. Most of all, I wish to acknowledge the unwavering support of Jack R. Davidson, Director of the University of Hawaii Sea Grant College Program, and Marvin Anderson, former Chancellor of the University of Hawaii at Manoa, which made it possible to complete this study.

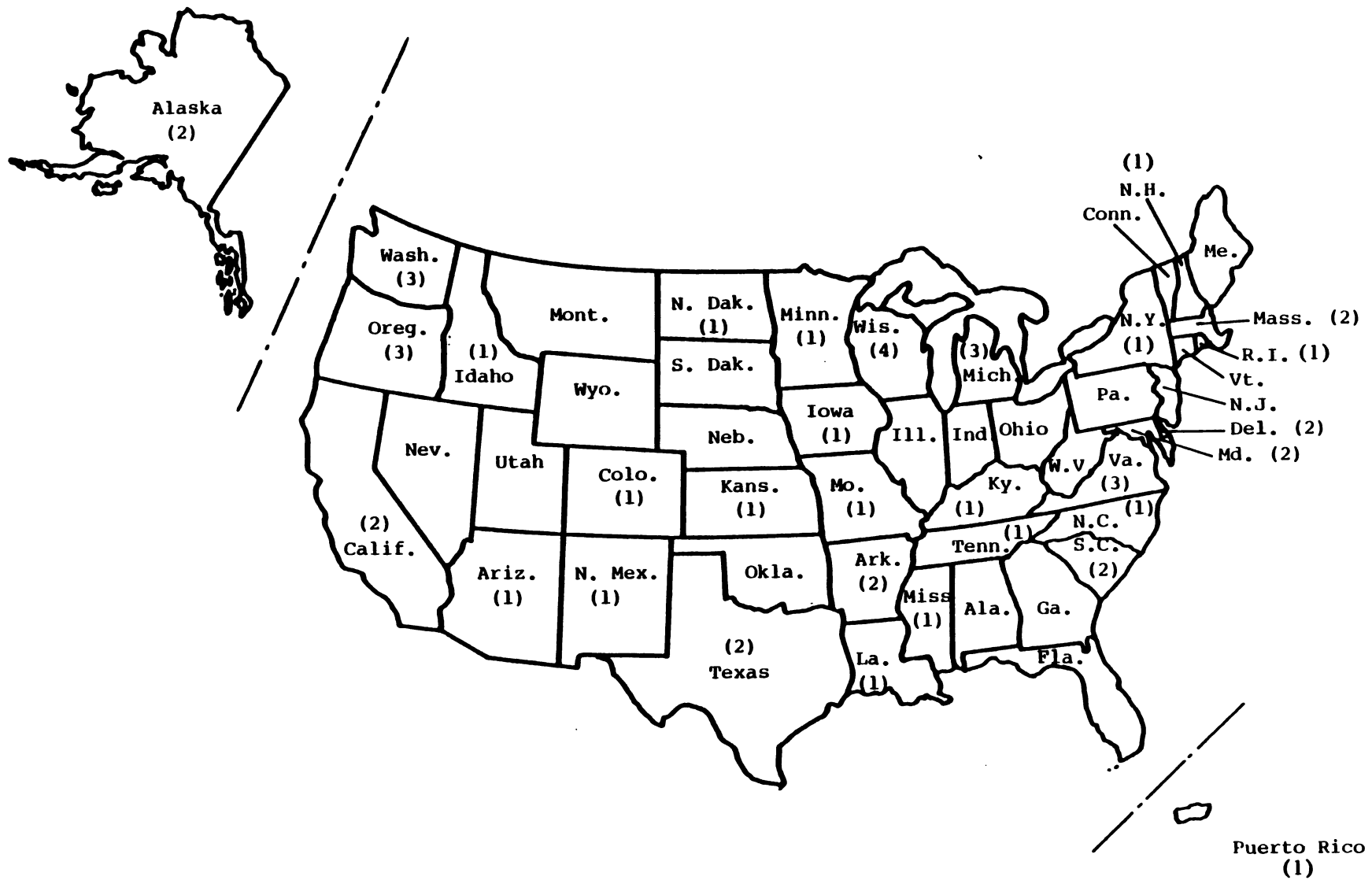
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**APPENDICES**



Appendix A. Institutional Participants in the National Survey  
on Fishery Education Programs (1984)



Distribution of institutions which have fishery education programs in the United States. Number of institutions, by state, is given in parentheses.

Alaska, University of  
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---

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Appendix B. Figures

## KEY TO ABBREVIATIONS USED IN THE FIGURES

### Figure 4

|           |                    |
|-----------|--------------------|
| adv. deg. | advanced degrees   |
| ass. deg. | associate's degree |

### Figure 5

|             |                     |
|-------------|---------------------|
| fish. tech. | fishery technology  |
| fish. bio.  | fishery biology     |
| res. mgt.   | resource management |
| process.    | processing          |

### Figure 8

|   |                                   |
|---|-----------------------------------|
| forest/fish.&wild<br>Fishery and Wildlife | Department or School of Forestry, |
| dept.of animal husb.                      | Department of Animal Husbandry    |
| dept./sch. of fish.                       | Department/School of Fisheries    |
| voc. training                             | vocational training               |
| coll. of mar studies                      | College of Marine Studies         |

### Figure 9

|                      |                                    |
|----------------------|------------------------------------|
| fisher. & academicia | fishermen and academicians         |
| grps                 | groups                             |
| res. mgrs & acad.    | resource managers and academicians |

### Figure 10

|       |           |
|-------|-----------|
| muni. | municipal |
| fed   | federal   |
| priv  | private   |

### Figure 11

|                     |  |
|---------------------|--|
| legi fish insti stu | legislature fishermen institutional<br>student |
|---------------------|--|

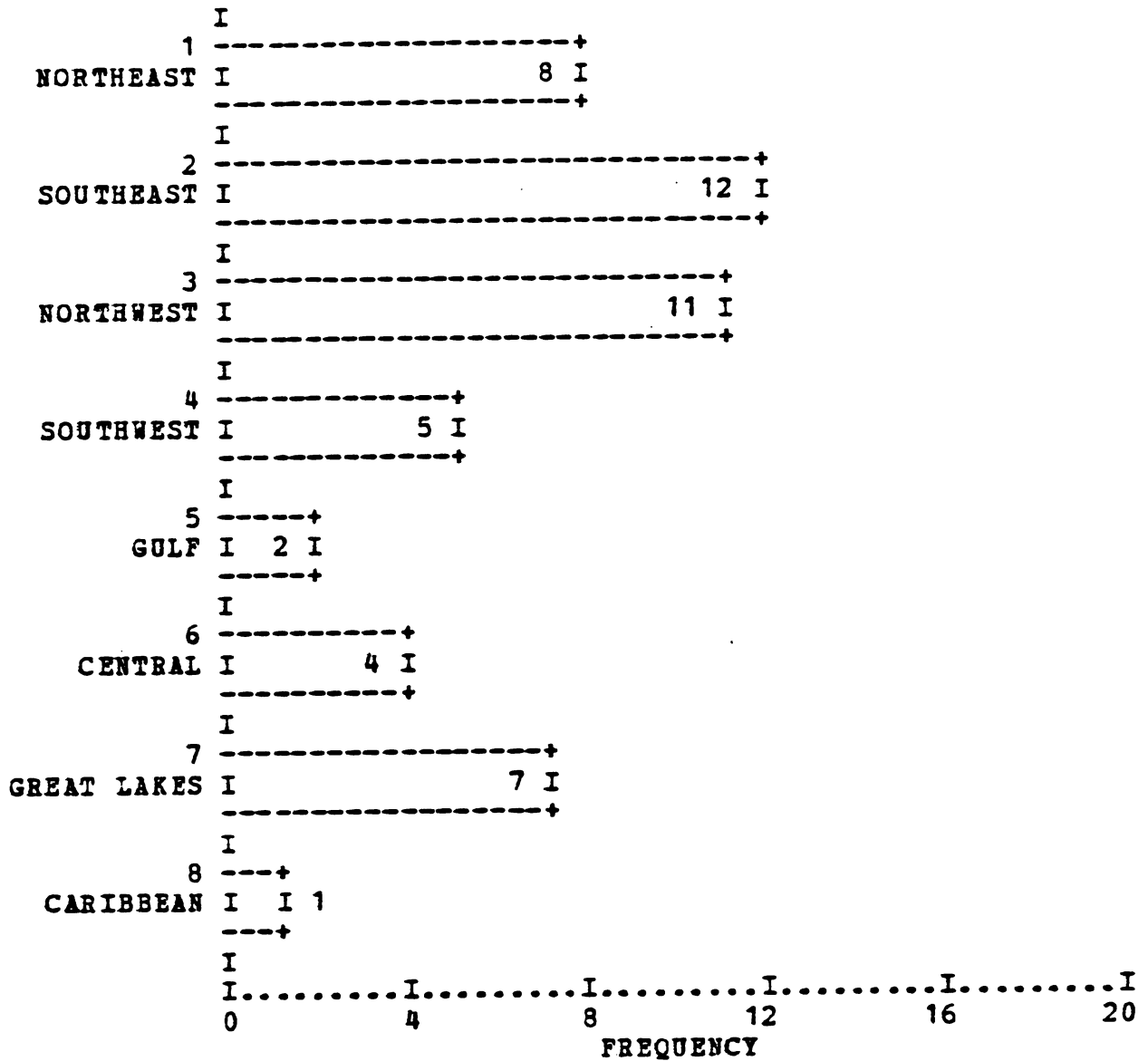


Figure 1. Frequency tabulation of regional distribution of institutions which have fishery education programs



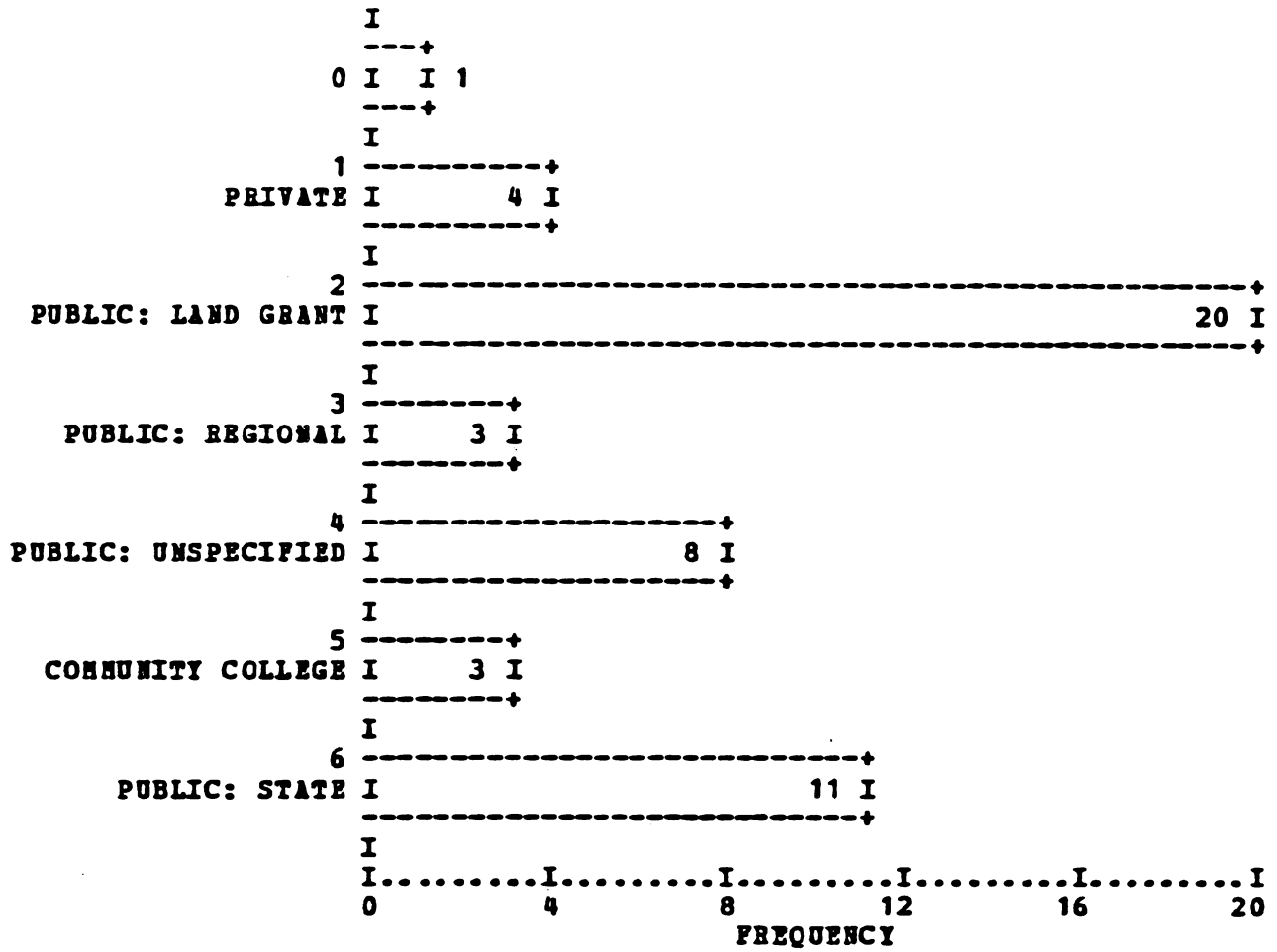


Figure 2. Frequency tabulation of types of institutions which have fishery education programs

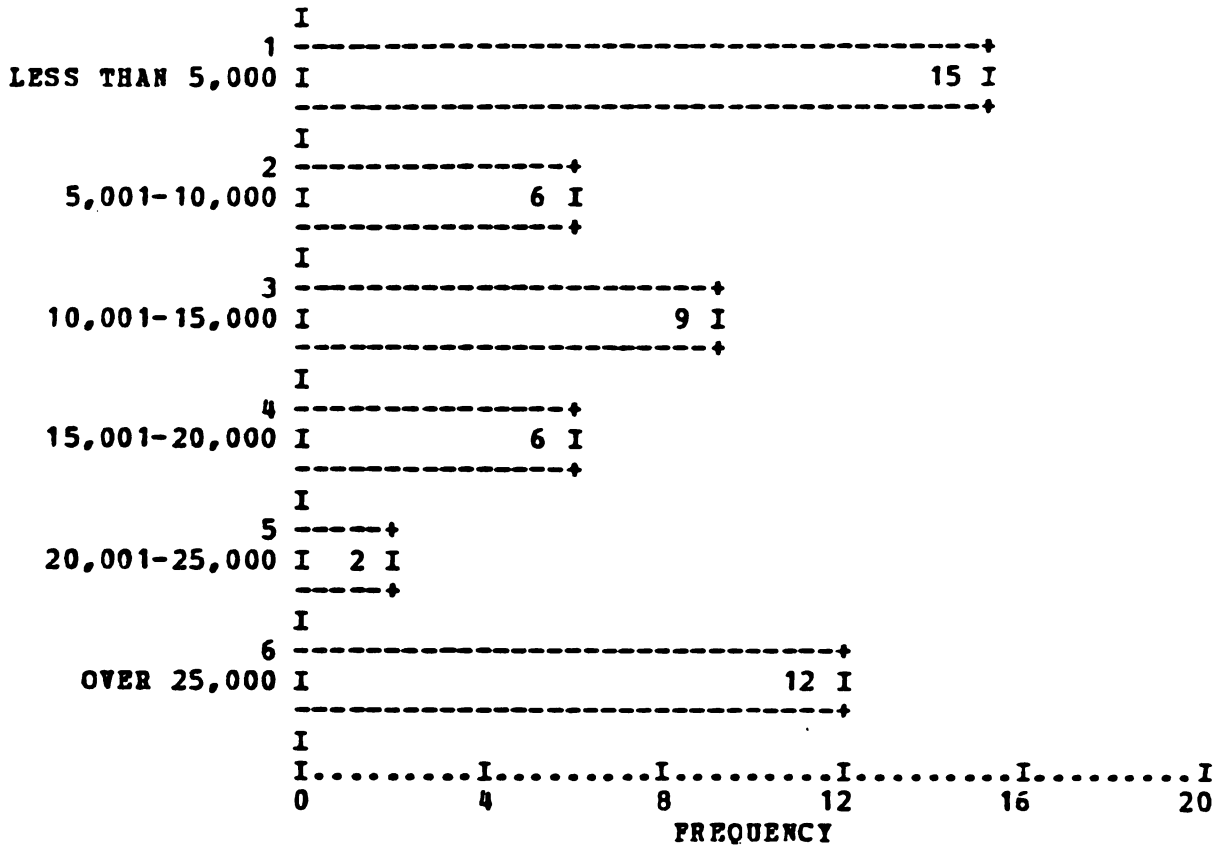


Figure 3. Frequency tabulation of sizes of institutions which have fishery education programs

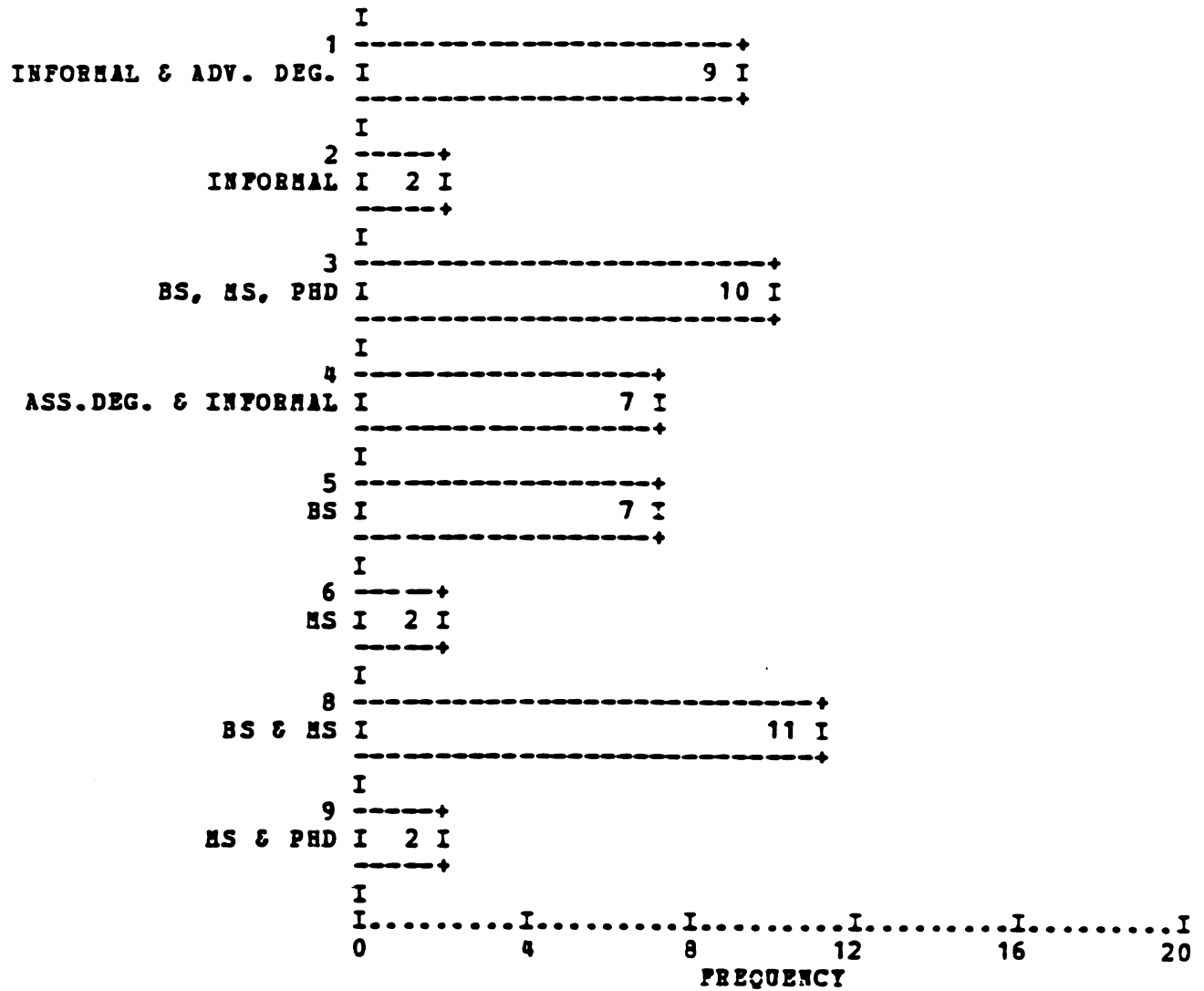


Figure 4. Frequency tabulation of types of fishery education programs offered in the United States

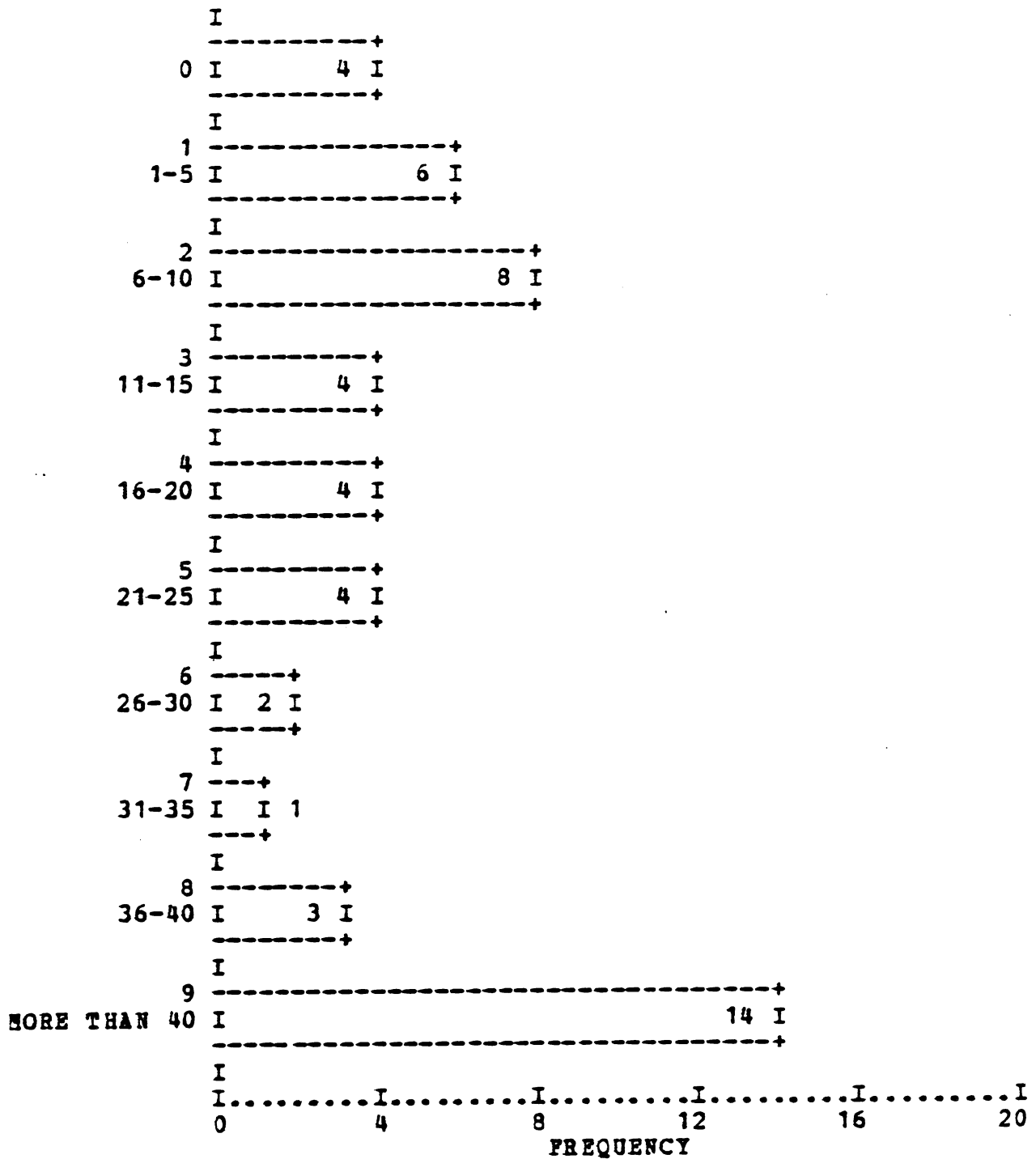


Figure 5. Frequency tabulation of enrollment of in-state students in fishery education programs in the United States

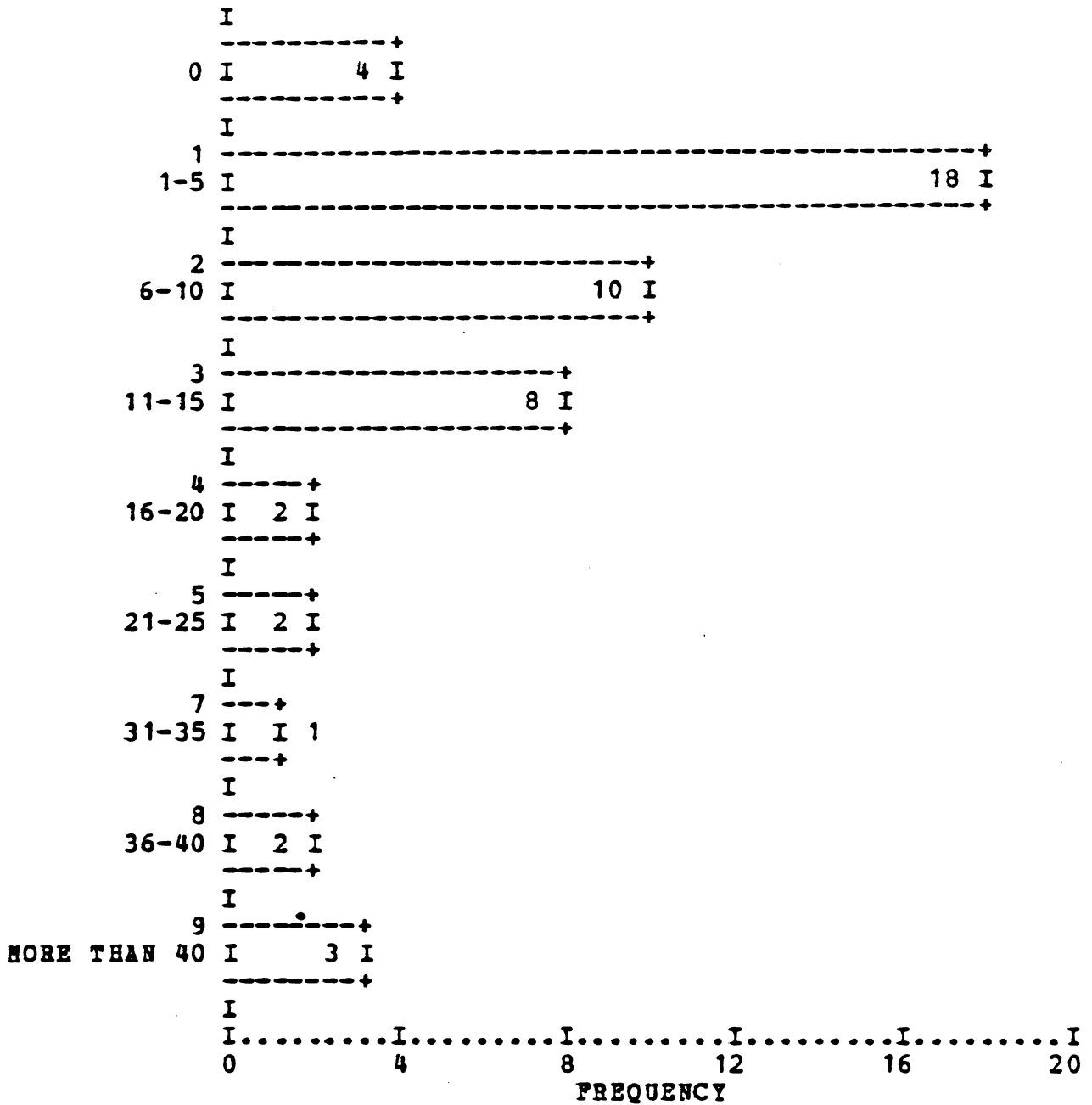


Figure 6. Frequency tabulation of enrollment of out-of-state students in fishery education programs

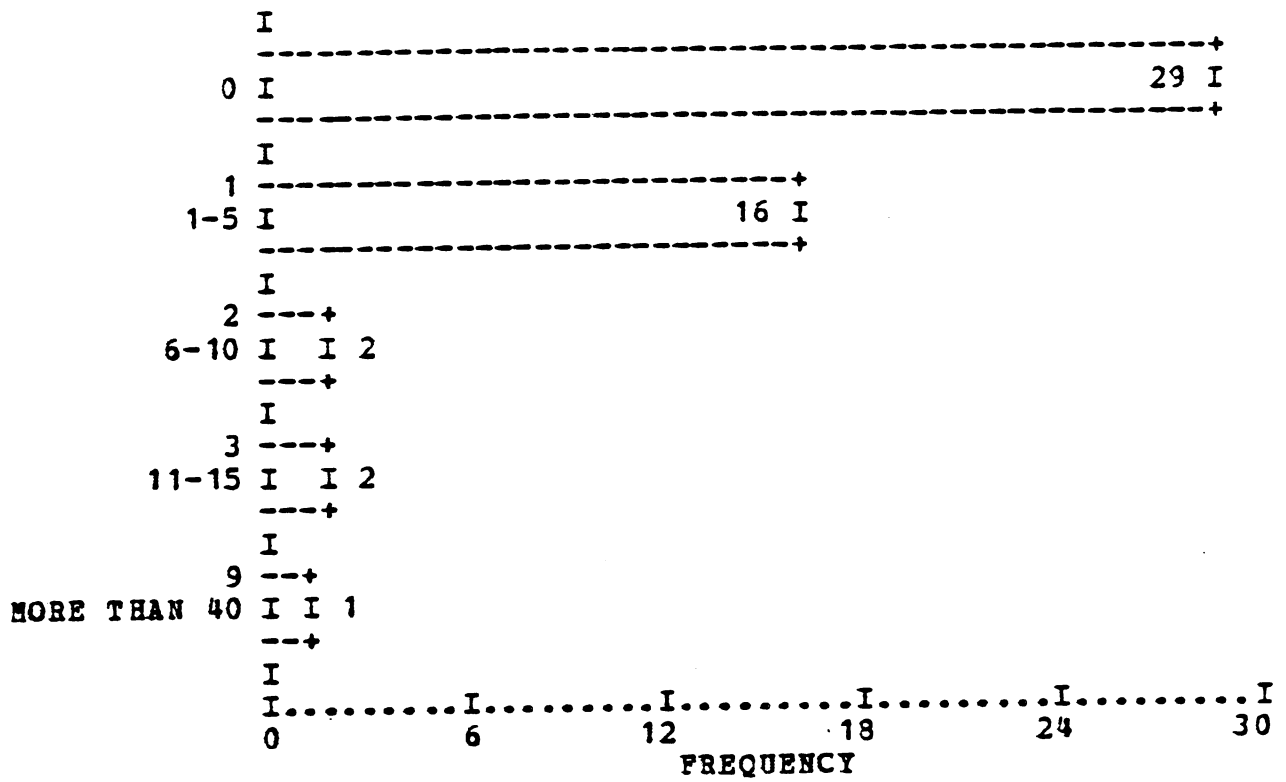


Figure 7. Frequency tabulation of enrollment of foreign students in fishery education programs

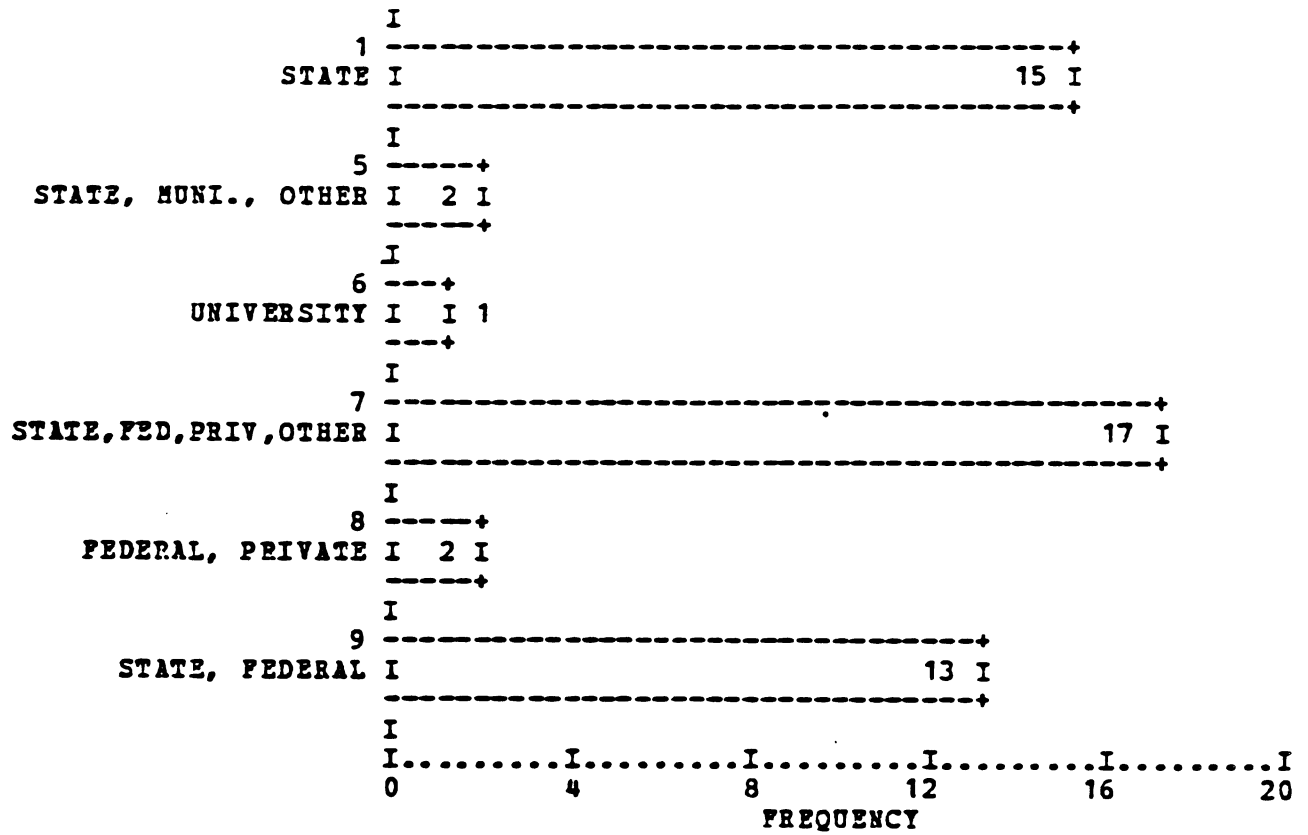


Figure 8. Frequency tabulation of funding sources

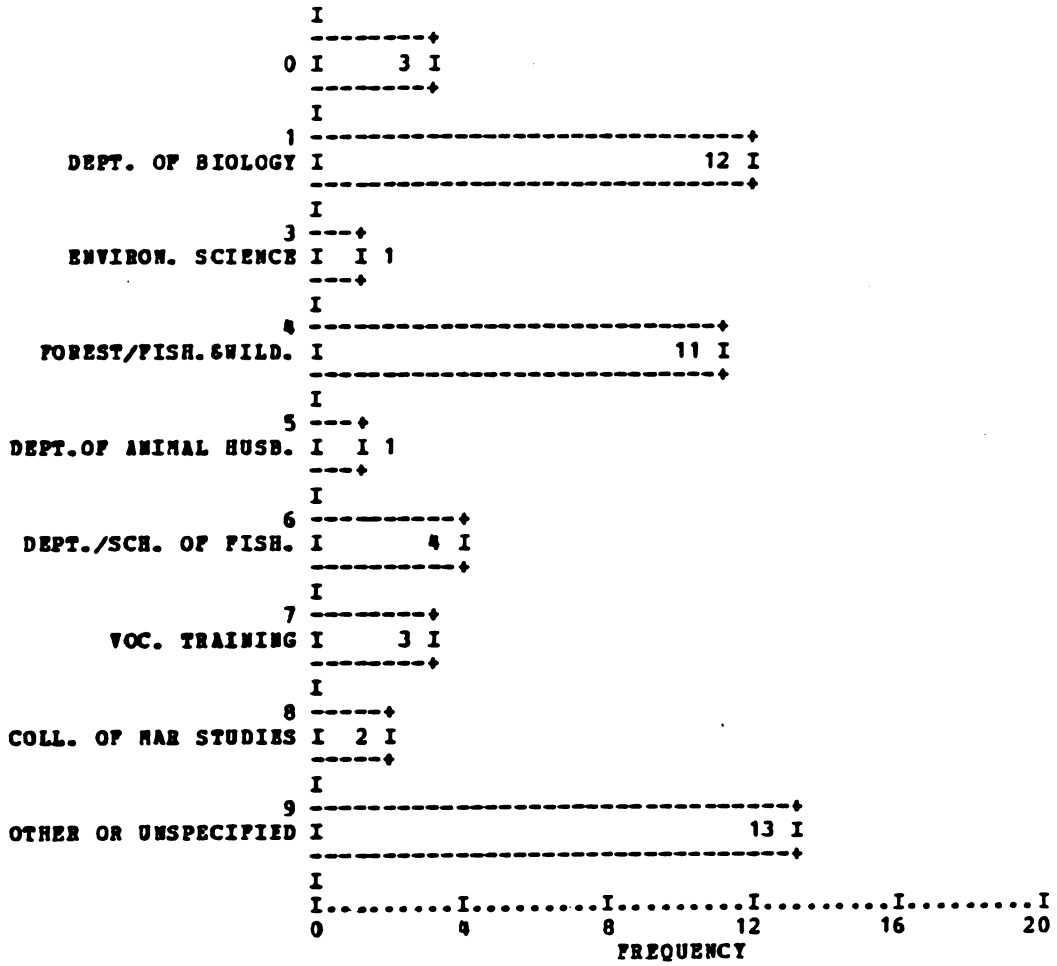


Figure 9. Frequency tabulation of departmental locus of fishery programs



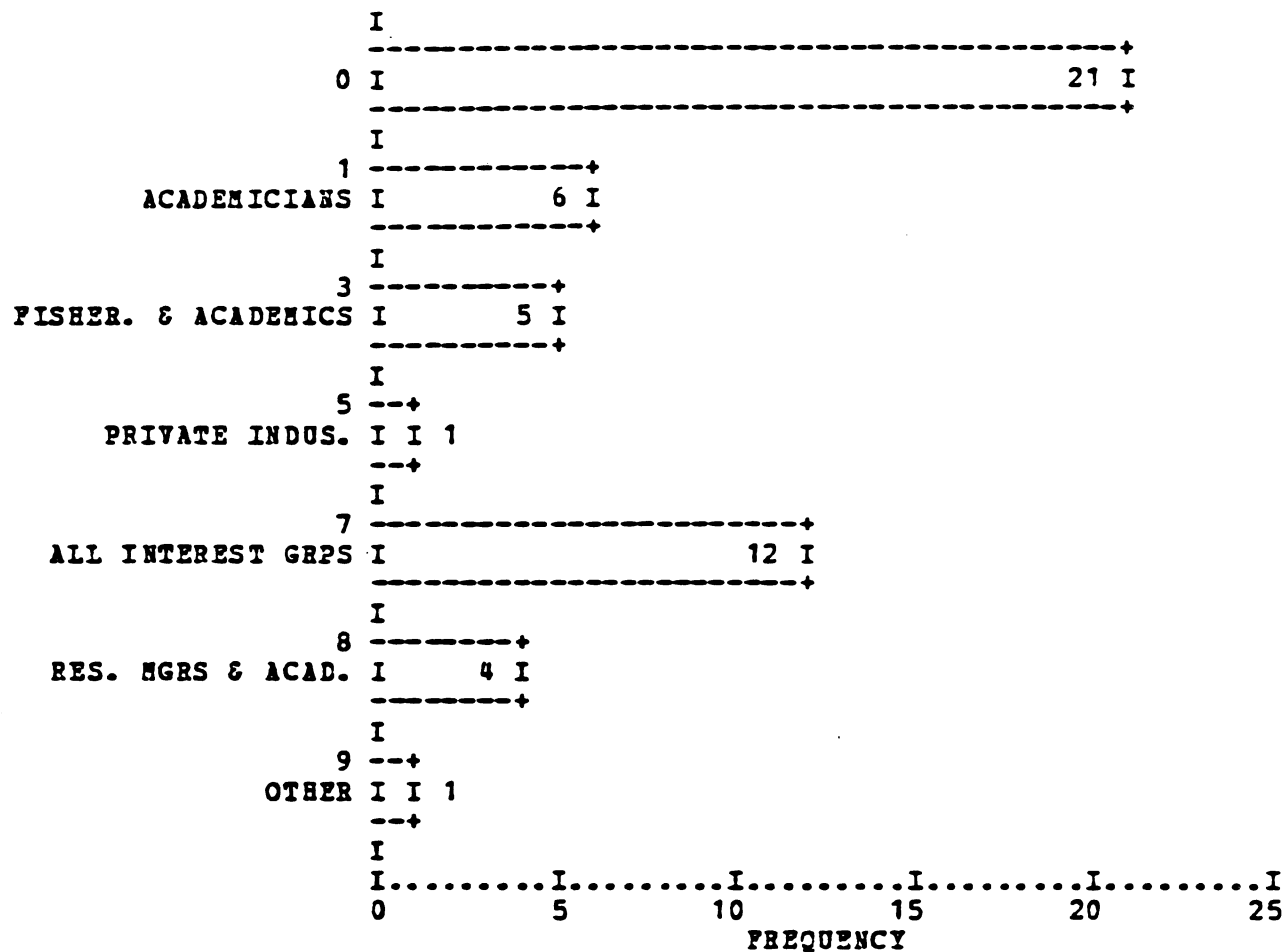


Figure 10. Frequency tabulation of composition of advisory committees

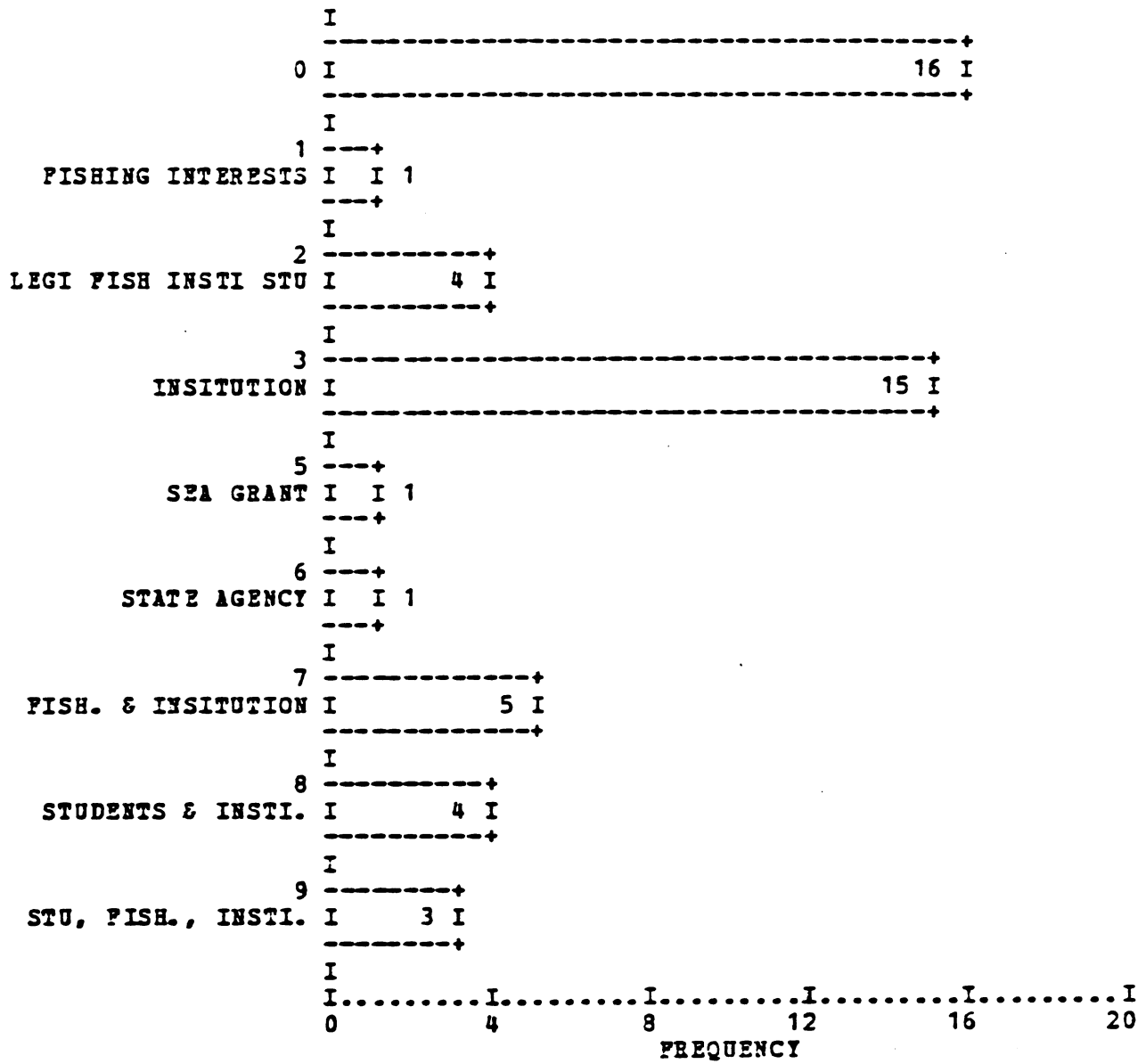


Figure 11. Frequency tabulation of sources of program expansion impetus

Appendix C. Tables

KEY TO ABBREVIATIONS USED IN THE TABLES

Table 10

adv. deg.  
ass. deg.

advanced degrees  
associate's degree

Table 11

fish. tech.  
fish. bio.  
res. mgt.  
process.

fishery technology  
fishery biology  
resource management  
processing

Tables 15 to 17

public: land gra  
public: unspecif

public: land grant  
public: unspecified

TABLE 1. FUNDING LEVELS: 1980-84

| Funding Level<br>(x \$1,000) | No. of Institutions |      |      |      |      |
|------------------------------|---------------------|------|------|------|------|
|                              | 1984                | 1983 | 1982 | 1981 | 1980 |
| <10                          | 2                   | 1    | 2    | 1    | 2    |
| 11-50                        | 2                   | 3    | 2    | 2    | 1    |
| 51-100                       | 5                   | 5    | 4    | 2    | 2    |
| 101-150                      | 4                   | 3    | 2    | 1    | 5    |
| 151-200                      | 2                   | 3    | 2    | 1    | --   |
| 201-250                      | 1                   | 4    | 4    | 3    | 1    |
| 251-300                      | 6                   | 3    | 1    | 2    | 1    |
| 301-400                      | 1                   | --   | 1    | 2    | 3    |
| >400                         | 8                   | 7    | 7    | 6    | 6    |
| Unspecified                  | 19                  | 21   | 25   | 29   | 29   |

TABLE 2. FOCUS OF FISHERY EDUCATION PROGRAMS

| Program Area                     | No. of Institutions |
|----------------------------------|---------------------|
| Fishery/Marine Biology           | 21                  |
| Fishery Management               | 4                   |
| Wildlife and Fishery Management  | 9                   |
| Marine Affairs/Law               | 2                   |
| Zoology                          | 2                   |
| Fishery and Marine Technology    | 7                   |
| Biological/Physical Oceanography | 3                   |
| Fishery Economics                | 1                   |
| Mariculture/Aquaculture          | 6                   |
| Fishery Science and Ecology      | 1                   |
| Fisheries                        | 5                   |
| Oceanographic Technology         | 1                   |
| Informal courses                 | 2                   |
| Food Science                     | 2                   |
| Aquatic and Marine Sciences      | 3                   |

TABLE 3. REGIONAL DISTRIBUTION OF INSTITUTIONS WITH FISHERY EDUCATION PROGRAMS

| VAR01            | COUNT | VAR02    |                     |                     |                          |                      |                  | ROW TOTAL   |
|------------------|-------|----------|---------------------|---------------------|--------------------------|----------------------|------------------|-------------|
|                  |       | PRIVATE  | PUBLIC:<br>LAND GRA | PUBLIC:<br>REGIONAL | PUBLIC:<br>UNSPECIF<br>Y | COMMUNIT<br>Y COLLEG | PUBLIC:<br>STATE |             |
|                  |       | 1        | 2                   | 3                   | 4                        | 5                    | 6                |             |
| NORTHEAST        | 1     | 1        | 4                   | 1                   | 2                        |                      |                  | 8<br>16.3   |
| SOUTHEAST        | 2     | 2        | 3                   | 1                   | 1                        | 1                    | 3                | 11<br>22.4  |
| NORTHWEST        | 3     |          | 4                   |                     | 3                        | 2                    | 2                | 11<br>22.4  |
| SOUTHWEST        | 4     |          | 4                   |                     | 1                        |                      |                  | 5<br>10.2   |
| GULF             | 5     |          |                     | 1                   |                          |                      | 1                | 2<br>4.1    |
| CENTRAL          | 6     | 1        | 3                   |                     |                          |                      |                  | 4<br>8.2    |
| GREAT LAKES      | 7     |          | 1                   |                     | 1                        |                      | 5                | 7<br>14.3   |
| CARIBBEAN        | 8     |          | 1                   |                     |                          |                      |                  | 1<br>2.0    |
| COLUMNS<br>TOTAL |       | 4<br>8.2 | 20<br>40.8          | 3<br>6.1            | 8<br>16.3                | 3<br>6.1             | 11<br>22.4       | 49<br>100.0 |

TABLE 4. REGIONAL DISTRIBUTION OF INSTITUTIONS BY SIZE

| VAR01        | COUNT | VAR03           |              |               |               |               |             | ROW TOTAL |
|--------------|-------|-----------------|--------------|---------------|---------------|---------------|-------------|-----------|
|              |       | LESS THAN 5,000 | 5,001-10,000 | 10,001-15,000 | 15,001-20,000 | 20,001-25,000 | OVER 25,000 |           |
|              |       | 1               | 2            | 3             | 4             | 5             | 6           |           |
| NORTHEAST    | 1     | 3               |              | 3             | 1             |               | 1           | 8         |
| SOUTHEAST    | 2     | 4               |              | 4             | 1             | 1             | 2           | 12        |
| NORTHWEST    | 3     | 5               | 2            | 1             | 2             |               | 1           | 11        |
| SOUTHWEST    | 4     | 2               |              | 1             | 1             |               | 1           | 5         |
| GULF         | 5     |                 | 1            |               |               |               | 1           | 2         |
| CENTRAL      | 6     |                 |              |               | 1             | 1             | 2           | 4         |
| GREAT LAKES  | 7     | 1               | 2            |               |               |               | 4           | 7         |
| CARIBBEAN    | 8     |                 | 1            |               |               |               |             | 1         |
| COLUMN TOTAL |       | 15              | 6            | 9             | 6             | 2             | 12          | 50        |
|              |       | 30.0            | 12.0         | 18.0          | 12.0          | 4.0           | 24.0        | 100.0     |

TABLE 5. REGIONAL DISTRIBUTION OF FISHERY PROGRAMS

| VARO1        | COUNT | VARO4           |              |             |                  |           |          |            |          | ROW TOTAL   |
|--------------|-------|-----------------|--------------|-------------|------------------|-----------|----------|------------|----------|-------------|
|              |       | INFORMAL & ADV. | INFORMAL PHD | BS, MS, PHD | ASS.DEG. & INFOR | BS        | MS       | BS & MS    | MS & PHD |             |
|              |       | 1               | 2            | 3           | 4                | 5         | 6        | 8          | 9        |             |
| NORTHEAST    | 1     | 3               | 1            |             | 2                | 1         |          | 1          |          | 8<br>16.0   |
| SOUTHEAST    | 2     | 1               |              | 3           | 1                | 4         |          | 3          |          | 12<br>24.0  |
| NORTHWEST    | 3     | 1               | 1            | 3           | 4                |           |          | 2          |          | 11<br>22.0  |
| SOUTHWEST    | 4     |                 |              | 2           |                  | 1         | 1        | 1          |          | 5<br>10.0   |
| GULF         | 5     | 1               |              |             |                  |           |          | 1          |          | 2<br>4.0    |
| CENTRAL      | 6     | 2               |              | 1           |                  |           |          | 1          |          | 4<br>8.0    |
| GREAT LAKES  | 7     | 1               |              | 1           |                  | 1         | 1        | 2          | 1        | 7<br>14.0   |
| CARIBBEAN    | 8     |                 |              |             |                  |           |          |            | 1        | 1<br>2.0    |
| COLUMN TOTAL |       | 9<br>18.0       | 2<br>4.0     | 10<br>20.0  | 7<br>14.0        | 7<br>14.0 | 2<br>4.0 | 11<br>22.0 | 2<br>4.0 | 50<br>100.0 |

TABLE 6. REGIONAL DISTRIBUTION OF FOCUS OF FISHERY EDUCATION PROGRAMS

| VARO1        | COUNT | VARO5             |                   |              |                   |                  |                   |  | ROW TOTAL   |
|--------------|-------|-------------------|-------------------|--------------|-------------------|------------------|-------------------|--|-------------|
|              |       | LICENSIN G: CAPTA | GEAR & P ISH. TEC | FISH. TE CH. | FISH.BIO ./RES. H | FISH.TEC H.&BIO. | PROCESS. &FISH.TE |  |             |
|              |       | 2                 | 4                 | 6            | 7                 | 8                | 9                 |  |             |
| NORTHEAST    | 1     |                   | 1                 |              | 1                 | 2                | 4                 |  | 8<br>16.0   |
| SOUTHEAST    | 2     | 1                 |                   |              | 10                |                  | 1                 |  | 12<br>24.0  |
| NORTHWEST    | 3     |                   | 2                 | 1            | 6                 |                  | 2                 |  | 11<br>22.0  |
| SOUTHWEST    | 4     | 2                 |                   |              | 3                 |                  |                   |  | 5<br>10.0   |
| GULF         | 5     |                   |                   |              | 1                 |                  | 1                 |  | 2<br>4.0    |
| CENTRAL      | 6     |                   |                   |              | 4                 |                  |                   |  | 4<br>8.0    |
| GREAT LAKES  | 7     |                   |                   |              | 6                 | 1                |                   |  | 7<br>14.0   |
| CARIBBEAN    | 8     |                   |                   |              | 1                 |                  |                   |  | 1<br>2.0    |
| COLUMN TOTAL |       | 3<br>6.0          | 3<br>6.0          | 1<br>2.0     | 32<br>64.0        | 3<br>6.0         | 8<br>16.0         |  | 50<br>100.0 |



TABLE 7. REGIONAL DISTRIBUTION OF IN-STATE STUDENTS ENROLLED IN FISHERY EDUCATION PROGRAMS

| VAR01        | COUNT | VAR06 |      |       |       |       |       |       |       |              | ROW TOTAL |
|--------------|-------|-------|------|-------|-------|-------|-------|-------|-------|--------------|-----------|
|              |       | 1-5   | 6-10 | 11-15 | 16-20 | 21-25 | 26-30 | 31-35 | 36-40 | MORE THAN 40 |           |
| NORTHEAST    | 1     | 1     | 3    |       | 1     | 1     |       |       |       | 2            | 8         |
| SOUTHEAST    | 2     | 3     | 1    | 1     | 2     |       |       |       | 1     | 2            | 10        |
| NORTHWEST    | 3     |       |      | 1     |       | 1     | 1     | 1     | 2     | 4            | 10        |
| SOUTHWEST    | 4     |       | 1    | 2     |       |       |       |       |       | 1            | 4         |
| GULF         | 5     |       | 1    |       |       | 1     |       |       |       |              | 2         |
| CENTRAL      | 6     |       | 1    |       |       | 1     |       |       |       | 2            | 4         |
| GREAT LAKES  | 7     | 2     | 1    |       | 1     |       | 1     |       |       | 2            | 7         |
| CARIBBEAN    | 8     |       |      |       |       |       |       |       |       | 1            | 1         |
| COLUMN TOTAL |       | 6     | 8    | 4     | 4     | 4     | 2     | 1     | 3     | 14           | 46        |
|              |       | 13.0  | 17.4 | 8.7   | 8.7   | 8.7   | 4.3   | 2.2   | 6.5   | 30.4         | 100.0     |

TABLE 8. REGIONAL DISTRIBUTION OF OUT-OF-STATE STUDENTS ENROLLED IN FISHERY EDUCATION PROGRAMS

| VAR01        | COUNT | VAR07 |      |       |       |       |       |       |              |  | ROW TOTAL |
|--------------|-------|-------|------|-------|-------|-------|-------|-------|--------------|--|-----------|
|              |       | 1-5   | 6-10 | 11-15 | 16-20 | 21-25 | 31-35 | 36-40 | MORE THAN 40 |  |           |
| NORTHEAST    | 1     | 1     |      | 1     |       | 2     | 1     | 1     | 1            |  | 7         |
| SOUTHEAST    | 2     | 7     | 3    |       | 1     |       |       |       |              |  | 11        |
| NORTHWEST    | 3     | 4     | 1    | 2     |       |       |       | 1     | 2            |  | 10        |
| SOUTHWEST    | 4     | 1     | 2    | 1     |       |       |       |       |              |  | 4         |
| GULF         | 5     | 1     |      | 1     |       |       |       |       |              |  | 2         |
| CENTRAL      | 6     | 1     | 2    | 1     |       |       |       |       |              |  | 4         |
| GREAT LAKES  | 7     | 3     | 1    | 2     | 1     |       |       |       |              |  | 7         |
| CARIBBEAN    | 8     |       | 1    |       |       |       |       |       |              |  | 1         |
| COLUMN TOTAL |       | 18    | 10   | 8     | 2     | 2     | 1     | 2     | 3            |  | 46        |
|              |       | 39.1  | 21.7 | 17.4  | 4.3   | 4.3   | 2.2   | 4.3   | 6.5          |  | 100.0     |

TABLE 9. REGIONAL DISTRIBUTION OF FOREIGN STUDENTS ENROLLED IN FISHERY EDUCATION PROGRAMS

| VAR01       | COUNT        | VAR08      |          |          |              | ROW TOTAL   |
|-------------|--------------|------------|----------|----------|--------------|-------------|
|             |              | 1-5        | 6-10     | 11-15    | MORE THAN 40 |             |
|             |              | 1          | 2        | 3        | 9            |             |
| NORTHEAST   | 1            | 4          |          |          |              | 4<br>19.0   |
| SOUTHEAST   | 2            | 2          | 1        |          |              | 3<br>14.3   |
| NORTHWEST   | 3            | 3          |          | 1        | 1            | 5<br>23.8   |
| SOUTHWEST   | 4            | 1          |          |          |              | 1<br>4.8    |
| GULF        | 5            | 1          |          |          |              | 1<br>4.8    |
| GREAT LAKES | 7            | 5          | 1        |          |              | 6<br>28.6   |
| CARIBBEAN   | 8            |            |          | 1        |              | 1<br>4.8    |
|             | COLUMN TOTAL | 16<br>76.2 | 2<br>9.5 | 2<br>9.5 | 1<br>4.8     | 21<br>100.0 |

TABLE 10. DISTRIBUTION OF IN-STATE STUDENTS IN TYPES OF INSTITUTIONS

| VAR02            | COUNT        | VAR06     |           |          |          |          |          |          |          |              | ROW TOTAL   |
|------------------|--------------|-----------|-----------|----------|----------|----------|----------|----------|----------|--------------|-------------|
|                  |              | 1-5       | 6-10      | 11-15    | 16-20    | 21-25    | 26-30    | 31-35    | 36-40    | MORE THAN 40 |             |
|                  |              | 1         | 2         | 3        | 4        | 5        | 6        | 7        | 8        | 9            |             |
| PRIVATE          | 1            |           |           |          | 1        | 1        |          |          |          | 2            | 4<br>8.9    |
| PUBLIC: LAND GRA | 2            | 2         | 5         | 2        | 1        | 1        |          | 1        | 1        | 5            | 18<br>40.0  |
| PUBLIC: REGIONAL | 3            | 1         | 1         |          |          | 1        |          |          |          |              | 3<br>6.7    |
| PUBLIC: UNSPECIF | 4            | 1         |           | 1        | 1        |          | 1        |          | 1        | 2            | 7<br>15.6   |
| COMMUNITY COLLEG | 5            |           |           |          | 1        | 1        |          |          | 1        |              | 3<br>6.7    |
| PUBLIC: STATE    | 6            | 2         | 2         | 1        |          |          | 1        |          |          | 4            | 10<br>22.2  |
|                  | COLUMN TOTAL | 6<br>13.3 | 8<br>17.8 | 4<br>8.9 | 4<br>8.9 | 4<br>8.9 | 2<br>4.4 | 1<br>2.2 | 3<br>6.7 | 13<br>28.9   | 45<br>100.0 |

TABLE 11. DISTRIBUTION OF OUT-OF-STATE STUDENTS IN TYPES OF INSTITUTIONS

| VAR02            | COUNT        | VAR07      |           |           |          |          |          |          | ROW TOTAL |              |             |
|------------------|--------------|------------|-----------|-----------|----------|----------|----------|----------|-----------|--------------|-------------|
|                  |              | 1-5        | 6-10      | 11-15     | 16-20    | 21-25    | 31-35    | 36-40    |           | MORE THAN 40 |             |
|                  |              |            | 1         | 2         | 3        | 4        | 5        | 7        | 8         | 9            |             |
| PRIVATE          | 1            | 2          |           | 1         |          |          |          | 1        |           |              | 4<br>8.9    |
| PUBLIC: LAND GRA | 2            | 5          | 6         | 2         | 1        | 1        |          | 2        | 1         |              | 18<br>40.0  |
| PUBLIC: REGIONAL | 3            | 2          |           |           |          | 1        |          |          |           |              | 3<br>6.7    |
| PUBLIC: UNSPECIF | 4            | 3          | 1         | 1         | 1        |          |          |          | 1         |              | 7<br>15.6   |
| COMMUNITY COLLEG | 5            | 2          | 1         |           |          |          |          |          |           |              | 3<br>6.7    |
| PUBLIC: STATE    | 6            | 4          | 1         | 4         |          |          |          |          | 1         |              | 10<br>22.2  |
|                  | COLUMN TOTAL | 18<br>40.0 | 9<br>20.0 | 8<br>17.8 | 2<br>4.4 | 2<br>4.4 | 1<br>2.2 | 2<br>4.4 | 3<br>6.7  |              | 45<br>100.0 |

TABLE 12. DISTRIBUTION OF FOREIGN STUDENTS IN TYPES OF INSTITUTIONS

| VAR02            | COUNT        | VAR08      |          |          |              | ROW TOTAL   |
|------------------|--------------|------------|----------|----------|--------------|-------------|
|                  |              | 1-5        | 6-10     | 11-15    | MORE THAN 40 |             |
|                  |              |            | 1        | 2        | 3            | 9           |
| PUBLIC: LAND GRA | 2            | 6          | 1        | 2        |              | 9<br>42.9   |
| PUBLIC: REGIONAL | 3            | 1          |          |          |              | 1<br>4.8    |
| PUBLIC: UNSPECIF | 4            | 3          |          |          |              | 3<br>14.3   |
| PUBLIC: STATE    | 6            | 6          | 1        |          | 1            | 8<br>38.1   |
|                  | COLUMN TOTAL | 16<br>76.2 | 2<br>9.5 | 2<br>9.5 | 1<br>4.8     | 21<br>100.0 |

TABLE 13. DISTRIBUTION OF TYPES OF FISHERY EDUCATION PROGRAMS IN INSTITUTIONS OF VARIOUS SIZES

| VAR03           | COUNT | VAR04           |          |             |                  |      |     |         |          |       | ROW TOTAL |
|-----------------|-------|-----------------|----------|-------------|------------------|------|-----|---------|----------|-------|-----------|
|                 |       | INFORMAL & ADV. | INFORMAL | BS, MS, PHD | ASS.DEG. & INFOR | BS   | MS  | BS & MS | MS & PHD |       |           |
|                 |       | 1               | 2        | 3           | 4                | 5    | 6   | 8       | 9        |       |           |
| LESS THAN 5,000 | 1     |                 | 1        |             | 6                | 5    | 1   | 2       |          | 15    |           |
| 5,001-10,000    | 2     |                 |          | 1           |                  |      | 1   | 3       | 1        | 6     |           |
| 10,001-15,000   | 3     | 1               | 1        | 2           |                  | 1    |     | 4       |          | 9     |           |
| 15,001-20,000   | 4     | 1               |          | 2           | 1                | 1    |     | 1       |          | 6     |           |
| 20,001-25,000   | 5     | 1               |          | 1           |                  |      |     |         |          | 2     |           |
| OVER 25,000     | 6     | 6               |          | 4           |                  |      |     | 1       | 1        | 12    |           |
| COLUMN TOTAL    |       | 9               | 2        | 10          | 7                | 7    | 2   | 11      | 2        | 50    |           |
|                 |       | 18.0            | 4.0      | 20.0        | 14.0             | 14.0 | 4.0 | 22.0    | 4.0      | 100.0 |           |

TABLE 14. REGIONAL DISTRIBUTION OF INSTITUTIONS WHICH ARE PROJECTING PROGRAM EXPANSION

| VAR01        | COUNT | VAR60 |      | ROW TOTAL |
|--------------|-------|-------|------|-----------|
|              |       | YES   | NO   |           |
|              |       | 1     | 2    |           |
| NORTHEAST    | 1     | 6     | 2    | 8         |
| SOUTHEAST    | 2     | 7     | 5    | 12        |
| NORTHWEST    | 3     | 7     | 4    | 11        |
| SOUTHWEST    | 4     | 1     | 4    | 5         |
| GULF         | 5     | 2     |      | 2         |
| CENTRAL      | 6     | 1     | 3    | 4         |
| GREAT LAKES  | 7     | 3     | 4    | 7         |
| CARIBBEAN    | 8     | 1     |      | 1         |
| COLUMN TOTAL |       | 28    | 22   | 50        |
|              |       | 56.0  | 44.0 | 100.0     |

TABLE 15. REGIONAL DISTRIBUTION OF PROJECTED FUNDING AND NUMBER OF INSTITUTIONS PROPOSING MODIFICATION OF EXISTING FACILITIES

| VAR01 | COUNT        | VAR62           |                    |             | ROW TOTAL   |
|-------|--------------|-----------------|--------------------|-------------|-------------|
|       |              | \$15,001-25,000 | MORE THAN \$65,000 | UNSPECIFIED |             |
|       |              | 3               | 8                  | 9           |             |
| 1     | NORTHEAST    | 1               | 3                  | 1           | 5<br>31.3   |
| 2     | SOUTHEAST    |                 | 1                  | 2           | 3<br>18.8   |
| 3     | NORTHWEST    |                 | 3                  |             | 3<br>18.8   |
| 5     | GULF         |                 |                    | 1           | 1<br>6.3    |
| 6     | CENTRAL      |                 |                    | 1           | 1<br>6.3    |
| 7     | GREAT LAKES  |                 |                    | 2           | 2<br>12.5   |
| 8     | CARIBBEAN    |                 | 1                  |             | 1<br>6.3    |
|       | COLUMN TOTAL | 1<br>6.3        | 8<br>50.0          | 7<br>43.8   | 16<br>100.0 |

TABLE 16. REGIONAL DISTRIBUTION OF PROJECTED FUNDING AND NUMBER OF INSTITUTIONS PROPOSING BUILDING OF NEW FACILITIES

| VAR01        | COUNT | VAR63                 |                       |             | ROW TOTAL   |
|--------------|-------|-----------------------|-----------------------|-------------|-------------|
|              |       | \$25,001-<br>\$35,000 | MORE THAN<br>\$65,000 | UNSPECIFIED |             |
|              |       | 4                     | 8                     | 9           |             |
| NORTHEAST    | 1     | 1                     | 1                     | 2           | 4<br>30.8   |
| SOUTHEAST    | 2     |                       | 1                     | 2           | 3<br>23.1   |
| NORTHWEST    | 3     |                       |                       | 2           | 2<br>15.4   |
| GULF         | 5     |                       | 1                     | 1           | 2<br>15.4   |
| CENTRAL      | 6     |                       |                       | 1           | 1<br>7.7    |
| CARIBBEAN    | 8     |                       | 1                     |             | 1<br>7.7    |
| COLUMN TOTAL |       | 1<br>7.7              | 4<br>30.8             | 8<br>61.5   | 13<br>100.0 |

TABLE 17. REGIONAL DISTRIBUTION OF DISTRIBUTION OF FUNDING AND NUMBER OF INSTITUTIONS PROJECTING THE ACQUISITION OF NEW EQUIPMENT

| VAR01        | COUNT | VAR64              |               |                 |                 |                 |                 |                    |              | ROW TOTAL |
|--------------|-------|--------------------|---------------|-----------------|-----------------|-----------------|-----------------|--------------------|--------------|-----------|
|              |       | LESS THA N \$5,000 | \$5,001-5,000 | \$15,001-25,000 | \$25,001-35,000 | \$35,001-45,000 | \$45,001-55,000 | MORE THA N \$65,00 | UNSPECIF IED |           |
|              |       | 1                  | 2             | 3               | 4               | 5               | 6               | 8                  | 9            |           |
| NORTHEAST    | 1     |                    | 1             | 2               |                 |                 |                 | 3                  | 2            | 8         |
| SOUTHEAST    | 2     | 1                  |               |                 |                 | 1               |                 | 1                  | 3            | 6         |
| NORTHWEST    | 3     |                    | 1             |                 |                 |                 |                 | 1                  | 2            | 4         |
| SOUTHWEST    | 4     |                    | 1             |                 | 1               |                 |                 |                    |              | 2         |
| GULF         | 5     |                    |               |                 |                 |                 |                 | 1                  | 1            | 2         |
| CENTRAL      | 6     |                    |               |                 |                 |                 |                 | 1                  | 1            | 2         |
| GREAT LAKES  | 7     |                    |               |                 | 1               |                 |                 | 1                  | 2            | 4         |
| CARIBBEAN    | 8     |                    |               |                 |                 |                 |                 | 1                  |              | 1         |
| COLUMN TOTAL |       | 3.4                | 10.3          | 6.9             | 6.9             | 3.4             | 6.9             | 24.1               | 37.9         | 29        |

TABLE 18. REGIONAL DISTRIBUTION OF FUNDING AND NUMBER OF INSTITUTIONS PROJECTING ACQUISITION OF A VESSEL

| VAR01        | COUNT | VAR65              |                    |              | ROW TOTAL |
|--------------|-------|--------------------|--------------------|--------------|-----------|
|              |       | LESS THA N \$5,000 | MORE THA N \$65,00 | UNSPECIF IED |           |
|              |       | 1                  | 8                  | 9            |           |
| NORTHEAST    | 1     |                    |                    | 1            | 16.7      |
| NORTHWEST    | 3     |                    | 1                  |              | 16.7      |
| SOUTHWEST    | 4     | 1                  |                    |              | 16.7      |
| GULF         | 5     |                    | 1                  | 1            | 33.3      |
| CARIBBEAN    | 8     |                    | 1                  |              | 16.7      |
| COLUMN TOTAL |       | 16.7               | 50.0               | 33.3         | 100.0     |

TABLE 19. REGIONAL DISTRIBUTION OF NUMBERS OF PROPOSED NEW STAFF AND INSTITUTIONS PROJECTING EXPANSION OF FACULTY

| VAR01        | COUNT | VAR66      |             |             |             |                       | ROW TOTAL |
|--------------|-------|------------|-------------|-------------|-------------|-----------------------|-----------|
|              |       | 1 POSITION | 2 POSITIONS | 3 POSITIONS | 6 POSITIONS | MORE THAN 6 POSITIONS |           |
| NORTHEAST    | 1     | 3          |             |             | 1           |                       | 4         |
| SOUTHEAST    | 2     | 4          | 1           |             |             |                       | 5         |
| NORTHWEST    | 3     | 1          | 3           |             | 1           |                       | 5         |
| SOUTHWEST    | 4     | 1          |             |             |             |                       | 1         |
| GULF         | 5     |            |             | 1           |             | 1                     | 2         |
| CENTRAL      | 6     |            | 1           |             |             |                       | 1         |
| GREAT LAKES  | 7     | 1          | 1           |             |             |                       | 2         |
| CARIBBEAN    | 8     |            |             | 1           |             |                       | 1         |
| COLUMN TOTAL |       | 10         | 6           | 2           | 2           | 1                     | 21        |
|              |       | 47.6       | 28.6        | 9.5         | 9.5         | 4.8                   | 100.0     |



TABLE 20. REGIONAL DISTRIBUTION OF NUMBERS OF PROPOSED NEW COURSES AND INSTITUTIONS PROJECTING ADDITION OF NEW COURSES

| VAR01       | COUNT                   | VAR67     |               |               |               |           | NO. UNKN<br>OWN | ROW<br>TOTAL |
|-------------|-------------------------|-----------|---------------|---------------|---------------|-----------|-----------------|--------------|
|             |                         | 1 COURSE  | 2 COURSE<br>S | 3 COURSE<br>S | 4 COURSE<br>S | 5         |                 |              |
| NORTHEAST   | 1                       | 1         |               | 2             |               |           | 1               | 4<br>30.8    |
| NORTHWEST   | 3                       | 2         | 1             |               |               | 1         |                 | 4<br>30.8    |
| GULF        | 5                       |           |               |               |               | 1         | 1               | 2<br>15.4    |
| GREAT LAKES | 7                       | 1         | 1             |               |               |           |                 | 2<br>15.4    |
| CARIBBEAN   | 8                       |           |               |               |               |           | 1               | 1<br>7.7     |
|             | <b>COLUMN<br/>TOTAL</b> | 4<br>30.8 | 2<br>15.4     | 2<br>15.4     | 2<br>15.4     | 3<br>23.1 | 13<br>100.0     |              |

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