The purpose of this study was to acquire baseline data about students' environmental knowledge and attitudes and to study the relationships of attitudes and knowledge to variables that would be of interest in evaluative measures. Three forms of an inventory were developed to test knowledge of specific facts and general concepts of the environment, as well as attitudes about certain aspects of the environment. The inventories were administered to 10,264 students in 199 schools located in 11 states of the mid-west and far-west. Results indicated that males scored significantly higher than females on items requiring knowledge of facts, but not on items dealing with general environmental concepts. Twelfth grade students scored significantly higher than tenth grade students on the environmental concept items, but not on the items requiring knowledge of environmental facts. In regard to attitudes, differences were found based on sex and grade level. The size of the community and the state of residence were found to be positively related to what was considered to be the major environmental concern in the community. Californian respondents selected air pollution, those in Wisconsin were more concerned with water pollution, and in Hawaii land use was considered to be of greatest importance. (JR)
yet substantiate this assertion.

**The Problem**

Many localized environmental education programs have realized the importance of attitude evaluation along with that of the cognitive domain. But the success of these programs in achieving knowledge and attitudinal goals may be questioned due to the absence of national baseline data whereby such programs could be compared. Therefore, curricular decisions could be based on safer grounds than philosophical inclinations if data were available which measured present environmental knowledge and attitudes of a national sample.

A determination of what manipulatable and nonmanipulatable variables are related to desired knowledge and attitudes would contribute to the evaluation. For example, if favorable environmental attitudes could be positively related to grade level or to locations where environmental education programs had stressed attitudinal change, there would be some basis for concluding that such programs have merit. Likewise, those programs which measure success in terms of gains in environmental knowledge would be strengthened if knowledge of the environment could be positively related to grade level or location of the school.

However, if such relationships are not found to exist, many programs attempting to alter attitudes and knowledge about the environment would be subject to serious
CHAPTER III

DESIGN OF THE STUDY

Introduction

This study involved the measurement of environmental knowledge and attitudes of a sample of tenth grade and twelfth grade students from a stratified random sample of schools in five Great Lakes and six Far Western states. This study is a part of a national survey designed to eventually assess environmental knowledge and attitudes of students in all 50 states and the District of Columbia.

The inventory used in the study was developed by staff of the ERIC Clearinghouse for Science, Mathematics, and Environmental Education and the Center for Science and Mathematics Education at The Ohio State University and by selected consultants.

Within each of the schools included in the study, up to 30 tenth grade students and 30 twelfth grade students were administered one of three forms of the inventory.

Gathered data were automatically transferred from machine scoreable answer sheets to computer cards for analysis
and summary by standard computer programs. Frequency counts and percentages, correlations, and chi square programs were employed to analyze the data.

This chapter is divided into the following sections:
(1) The Population; (2) The Sample; (3) Instrumentation;
(4) Data Collection Procedures; (5) Analysis of Data.

The Population

The population consisted of all 8999 public secondary schools in the states of Alaska, California, Hawaii, Illinois, Indiana, Michigan, Nevada, Ohio, Oregon, Washington, and Wisconsin as listed by Gertler (1970). The population for this study was subdivided into the Great Lakes region, and the Far West region. Table 1, p. 51 presents the reported number of secondary schools in each of the states of the two regions which comprised the total population.

The Sample

Overview

The number of secondary schools selected from each of the eleven states within the Great Lakes and the Far West regions was calculated on the basis of the ratio of their secondary school enrollment to the total United States secondary school enrollment. Comparable steps at the state and county levels, respectively, determined the numbers of
CHAPTER V

SUMMARY, CONCLUSIONS AND IMPLICATIONS,
AND RECOMMENDATIONS

Summary

Most school systems have realized the importance of environmental education programs as part of their curriculum. However, due to a lack of research, many curricular decisions are being made on a questionable basis and with questionable results. Therefore, the purpose of this endeavor was to acquire baseline data about students' environmental knowledge and attitudes and to study their relationships to variables which would be of interest in evaluative measures.

Three forms of an inventory were developed which contained items requiring knowledge of specific facts and general concepts of the environment. Also, several items elicited students' attitudes about certain aspects of the environment.

The inventory was administered to a maximum of 30 tenth grade students and 30 twelfth grade students from
schools which were randomly selected from the Great Lakes
states of Illinois, Indiana, Michigan, Ohio, and Wisconsin;
and the Far West states of Alaska, California, Hawaii,
Nevada, Oregon, and Washington.

With the aid of frequency counts and percentages, corre-
lations, and chi square analyses, data were analyzed in
an attempt to determine trends and relationships.

It was found that males did significantly better than
females on items requiring knowledge of facts, but not on
items dealing with general environmental concepts. Twelfth
graders scored significantly higher than tenth graders on
the environmental concept items, but not on the items re-
quiring knowledge of environmental facts.

In regard to attitudes, differences were found based
on sex and grade level. However, the calculation of a chi
square statistic using proportions instead of the total num-
ber of cases indicated that the differences were slight.

The size of the community where respondents lived and
went to school was not significantly related to knowledge
of environmental facts and concepts, but was related to
items requesting the respondent to identify what he thought
to be the major environmental problem in his community. Us-
ing a forced choice technique, there was a positive rela-
tionship between the size of community and the selection of
pollution as the major community problem. However, this
trend was reversed in cities over 100,000 population.
State of residence was also related to what was considered to be the major environmental problem in the community. California respondents selected air pollution; Wisconsin respondents were more concerned with water pollution; and respondents from Hawaii considered land use to be the major concern.

Due to the large sample used in this study (10,264), no significant relationships went undetected. Also, where no relationships were found, it is not likely relationships existed. In calculating chi square values using proportions, samples were so large in most cases that the percentages could be considered very stable. Hence, a replication of the study should provide similar results unless actual changes in population parameters have occurred.

Conclusions and Implications

In the following section, conclusions and implications which can be drawn from this survey will be discussed in relation to past research.

In comparing states on the environmental knowledge variables, responses were quite consistent, especially among the larger states with larger sample sizes. The mean knowledge scores for all states except Alaska, Hawaii, and Nevada ranged from 50.1-52.9. Apparently, the impact of state efforts in environmental education was not strong enough at