

THE NEED FOR WATER RESOURCES EDUCATION IN THE PUBLIC SCHOOLS

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I. Introduction

- A. The Public Schools are called upon to meet the changing needs of society. Two examples of this are -- driver education, and the school lunch program.
- B. Administrators have become wary, rightfully so, to the many demands made for new elements to be added to the curriculum. Once an element is added, it is difficult to eliminate even if later it becomes unnecessary.
- C. However, basically, we expect to accomplish lasting and long range objectives by depending on the curricula of the schools; therefore, water resources education may be an exciting area for development in New Mexico.

II. What is being done, now?

- A. State Department of Education - in teacher's handbook "Elementary Science and Conservation"
Brief 'foreward' or 'overview' - "Water is the life blood of a civilization and it is used continually in the process of living. Water cannot be destroyed but can be used over and over again. Water is of value in proportion to the number of times it is used.

New Mexico has about 700,000 acres of irrigated land. The largest irrigation systems in the state are those that the Federal Government developed along the Rio Grande and Pecos rivers.

Water conservation concerns itself with the prevention of unwise water use. Pollution of streams and lakes can easily undo many construction conservation efforts. Devastating floods and soil erosion by water need no longer menace a people if the will to prevent them is strong enough. Proper knowledge of water engineering and agricultural practices have been developed scientifically and practically. The agricultural expert, the engineer, and the legislator are cooperating to make possible the intelligent use of water, but more education is needed to direct the attention of the average citizen toward helping in this much needed work." 1/ - Certainly this represent no undue emphasis upon water. This is followed by division into primary and intermediate with a few "understandings and learnings" and "pupil activities" suggestions

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1/ Elementary Science and Conservation, Teachers Handbook for New Mexico, page 91, issued by Superintendent of Public Instruction, Bulletin No. 16, 1953, Santa Fe, New Mexico

in each division. This, however, is a start only.

- B. Survey of selected schools showed eleven out of twenty offering some water education.
- C. Survey of selected schools, Elementary level.
1. Ten out of twenty provided some water education.
 2. Four out of twenty stated this effort incidental only.
 3. One out of twenty stated this was an important area.
 4. Seven out of twenty stated water education was taught through unit or problem approach.
- D. Survey of selected schools, Secondary level.
1. Ten out of twenty offer some water education.
 2. The following subject fields were indicated as areas where water education occurs:
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|-------------------------|---------------------|
| Biology | Seven out of twenty |
| Vo. Agriculture | Six out of twenty |
| General Science | Six out of twenty |
| History | Six out of twenty |
| Economics and Sociology | Five out of twenty |
| Chemistry | Three out of twenty |
- E. Additional information from survey.
1. Ten out of twenty elementary schools cooperate with U. S. Forest Service in forest conservation education.
 2. Twelve out of twenty believe New Mexico schools should include greater emphasis on water education. Comments:
 - a. "not to the extent of any special courses in it."
 - b. "Yes, provided emphasis is on water resources conservation."
 3. Twelve out of twenty believe more adequate sources of water resources education materials would increase the desirability of strengthening the program in public education. Comments:
 - a. "perhaps."
 - b. "we have lots of material now."

III. Colleges and Universities.

- A. What are the higher education institutions doing?

The following is a selected list of courses pertaining to water, offered in New Mexico Colleges and Universities.

WATER RESOURCES EDUCATION

<u>University of New Mexico</u>	<u>Semester Hours</u>
Bio 179 Conservation	3
CE 120 Engineering Hydrology	2
CE 161L Water Supply	3
Geol 161 Ground Water	2

<u>Eastern New Mexico University</u>		<u>Semester Hours</u>
Ag 301	Soil Management	3
Geog 403	Geography of North America	3
Geog 481	Principles of Conservation	5

<u>New Mexico Institute of Mining and Technology</u>		
561-562	Theory of Ground Water Motion	3
566	Prospecting for Ground Water	3

<u>New Mexico State University</u>		
Ag Econ 450	Land Economics	3
Ag Econ 460	Economy of Water Resources & Use	3
Agron 313	Irrigated Soils	3
Agron 452	Soil Physics	4
Geog 321	Geography of North America	3
Geog 330	Geography of New Mexico	2
Geog 440	Conservation of Natural Resources	2
AEngr 343	Soil and Water Conservation	3
AEngr 345	Irrigation and Drainage	3
AEngr 445	Engr. for Soil and Water Conservation	4
AEngr 447	Irrigation and Drainage Engr.	4
CE 451	Water Supply	3
CE 480	Irrigation and Drainage	3
CE 551	Advanced Water Supply	3

<u>New Mexico Highlands University</u>		<u>Quarter Hours</u>
Bio 385	Conservation of Natural Resources in New Mexico	4
Geog 310	Geography of North America	3

Below is the approved Agricultural Economics curriculum in Water Resources at New Mexico State University:

<u>Freshman Year</u>		<u>Semester Hours</u>
AH 100	Introduction to Animal Husbandry	3
Bio 101	Plant Biology	4
Bio 102	Animal Biology	4
Chem 101-102	General Chemistry	8
Eng 101-102	Freshman Composition	6
PE 104-105	Basic Activities	2
AS or MS 101-102	First Year Basic	4
PH 101	General Poultry	3

<u>Sophomore Year</u>		
Agron 251	Farm Crops	4
Agron 252	Soils	4
Chem 211	Organic Chemistry	4
Econ 253	Introduction to Economics	3
Math 131-132	First Year College Math	8
AS or MS 201-202	Second Year Basic	4
Hort 200	General Horticulture	4
ME 111	Graphics I	3

<u>Junior Year</u>		
Math 231-232	Calculus I, II	7

CE 222	Plane Surveying	3
Phys 231	Engineering Physics	4
Eng 205	Engineering English or	
Eng 207	Communication in Agriculture	2
CE 233	Statics	3
English Elective		2
Speech 253	Public Speaking	2
Agron 452	Soil Physics	4
ME 234	Dynamics	3
Ag Econ 454	Agricultural Prices	3
Ag Econ 460	Economics of Water Use	3
Electives		1
<u>Senior Year</u>		
Ag Econ 458	Farm Finance	3
Ag Engr 445	Engr. Soil and Water Conservation	4
ME 338	Fluid Mechanics	3
Ag Econ 480	Ranch Economics	3
Ag Engr 447	Irrigation and Drainage Engr.	4
CE 431	Hydraulics Lab	2
Ag Econ 490	Agricultural Policy	3
CE 254	Advanced Surveying	3
Ag Econ 450	Land Economics	3
Electives		10

- B. If we accept that the public schools are called upon to meet the changing needs of society then, rightfully, we should explore what the higher education institutions are doing about water problems in the preparation of teachers.

Usually a course is offered to prospective teachers, elective in nature, and ordinarily with a title such as "Conservation" or "Conservation of Natural Resources in New Mexico."

In preparation of teachers, using methods course and the state course of study, could increase emphasis on water resources education in intermediate through 8th grade.

More units on dams, earthen tanks, movement of water, conversion of sea water, etc.

Probably one of the most important steps would be to insure that all elementary teachers of the future are conscious of water problems and integrate water as an important part of the curriculum.

This could and should be accomplished through existing courses, not new courses.