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ABSTRACT

A bibliography of marine-oriented commercial and public domain coursewaze has been maintained by the Computer Education Committee of the Mid-Atlantic Marine Education Association for several years. This compilation is provided to interested persons by an established network with the following purposes: (1) to review and critique commercial and public domain software appropriate for marine education; (2) to share teacher produced, student produced, and public domain software on marine related topics; and (3) to encourage the educational use of computers in the teaching of marine topics. The publication contains: an introduction; more than 60 annotated bibliographies of computer software, of which about 20 reviews are included; a list of publishers; and information on the Computers in Marine Education Network. Each entry provides a description of the program, title, publisher, intended audience, computer(s) used, and price. (RT)

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BIBLIOGRAPHY OF MARINE EDUCATION SOFTWARE

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INTRODUCTION

This bibliography was compiled by Skip McLamb and Susan Walton and is provided to interested persons as a service of the COMPUTERS IN MARINE EDUCATION NETWORK. Information about the network can be found on the final page of this booklet.

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HOW TO USE THIS BIBLIOGRAPHY

The format used for the annotated section of this bibliography is shown below.

TITLE PUBLISHER
PRICE AUDIENCE
COMPUTERS THAT RUN THE SOFTWARE

DESCRIPTION

An asterix * by the title indicates that a review is available in the second section of the booklet.

ANNOTATED BIBLIOGRAPHY

Acid Rain — American Micro Media
$60 — Jr. - Sr. High
Apple

A tutorial program that explores the relationship between the generation of electrical power and the deterioration of the aquatic environment.

Aquarium — Programma
Elementary
Apple II

Seven interactive programs allow children to set up aquaria and observe the interactions of various organisms.

Beachcombing Treasures* — Spectrum Software
$52 — Elementary
Apple

A group of 25 aquatic items, shells, starfish, etc. accompany this program. Students are guided by the computer in making observations and answering questions about the aquatic remains. The interactive format and graphics are highlights of the program.

Characteristics of a Scientist — Cygnus
$39 — Jr. - Sr. High
Apple II

Students investigate the characteristics of a scientist including curiosity, observation, skepticism, and open-mindedness. Throught provoking puzzles, graphics, and effective questioning techniques maintain student interest.

CME Public Domain Disk* — CME Network
$7 — Ele. - Sr. High
Apple

This disk contains four oceanography programs including a vocabulary builder, a tutorial on ocean bottom geography, a simulation on ocean bottom mapping, and a tutorial on Chesapeake Bay fishes.

Computers in the Biology CurriculuCarolina Biological
$100 — Jr. - Sr. High
Apple

Seven programs that deal with a variety of biology topics including PREDATOR - PREY RELATIONSHIPS, POND ECOLOGY, and STSTISTICS FOR BIOLOGY. 162 pages of documentation are included with the programs.

Coral Reefs and Their Inhabitants* | Educational Images
$60 | Ele. - High School
Apple II

A tutorial program with color graphics describing coral reefs and presenting information on the marine life found in these areas.

Dolphin Dialogue | Syntauri Corp.
$39 | Jr. - Sr. High
Apple

This is a program produced as part of a research project on dolphins. The program uses the computer to translate human sounds into dolphin sounds.

Ducks* | M.E.C.C.
$44 | 12 - Adult
Apple II

A highly interactive program that provides practice in water fowl identification and tests the user on hunter ethics. The program incorporates a game element that motivates the learner.

Earth Science Series | TYC Software
$25 | Jr. - Sr. High
TRS-80

This is a tutorial program reinforced with problems and simulations covering eleven earth science topics including stream erosion and water budget.

Eutroph | Educational Images
$40 | Jr. - Sr. High
Apple

This program analyzes data from laboratory tests of a still water environment to determine the degree of eutrophication of the body of water.

Fish and Fishing | CDL
$58.95 | Secondary - College
Apple II

Students experiment with stable and unstable ecosystems to determine the effect on different types of fish. The program uses 19 species of game fish.

Food Web Game — Ann Coopersmith

Apple II

Students research food preferences of animals in habitats they are studying and enter the lists in a data base. Students can then build food webs representative of the area studied.

Forecast — CBS
$59.95

Apple, IBM, Comodore, Tandy

This meteorology program allows students to collect and input data for weather predicting, has a log for tracking weather trends, a hurricane tracker, and discusses many meteorology topics. The program is accompanied by a 60 page guide.

Go Fish — HRM Software
$69.00 — Grades 6-12

Apple II

Students use a fishing expedition simulation to learn about navigation and maps. Students must make decisions about where to fish, how to navigate, and where to sell their fish.

Groundwater — IBM Corp.
$44

IBM

Emphasizes the importance of groundwater and explores the human and environmental factors that influence its supply and quality.

Groundwater Protection — VA Water Resources Research Cen
Free — Middle School

Apple II

This simulation is designed to increase an awareness of the need to protect groundwater resources. Students conduct an investigation to determine the source of contamination in a well.

HMSS Computer Explorations — HMSS Software

This software package includes computer simulations on navigation astronomy, and contour mapping.

Hydrologic Cycle — IBM Corp.
$44
IBM

Tutorial programs show the processes and exchanges of energy that take place as water circulates through the hydrologic cycle.

Island Biogeography — Conduit
$50
Apple

Three programs explain the factors that control the distribution and abundance of organisms in an island biological community.

Lake Study — Project Seraphim, NSF Project
$7.00
Apple, Atari

The program allows you to collect data and identify pollutants killing fish in a lake.

Life in the Ocean — K-12 MicroMedia
$79.00
Apple II

Simulates deep ocean exploration. Students navigate a bathyscaph to trap ocean life, dig for minerals, and dive to the deepest parts of the ocean.

Marine Life Series — Ventura Software
Apple

Four programs, Anatomy of a Fish, Anatomy of a Shark, Invertabrates, and Anatomy of a Sea Lamprey use tutorials, data bases, quizzes and games to examine sea animals. The programs are available separately, or as a package.

Moisture in the Atmosphere — IBM Corp.
$44
IBM

The program explains cloud formation and the role of moisture in the weather process.

Ocean Tides & Currents* — Educational Images
$50 — Ele. - High School
Apple II

A tutorial program with color graphics describing major tide and current patterns in the oceans.

Odell Lake* — American Micromedia
$25 — Ele. - High School
Apple II

This program presents a simulation of a lake that explores the food chain concept. The user plays the role of a fish and upon encountering other inhabitants of the lake must decide on the most apropriate action to take.

Outdoor Biology — M.E.C.C.
$45 — Ele. - Jr. High
TRS 80

The student plays the role of an animal or fish to discover their role in the food web.

Pollute — CDL
$54.95 — Secondary - College
Apple, IBM, Com., TRS-80

A simulation which examines the impact of various pollutants on typical bodies of water. The computer generates tabular and graphic data to enable the student to test various hypotheses.

Pollution — A.W. Peller
$75 — Jr. - Sr. High
Apple II

This program examines the effect of pollutants on aquatic systems

Pond Ecology — Queue
$49.95
Apple II

Simulates ecological interaction in a pond and allows students to study the interactions between the three major trophic levels. The impact of man on the ecosystem is also investigated.

Pond Study — Project Seraphim, NSF Project
$7.00
Apple

You collect data and identify pollutants in a pond.

Science Toolkit* — Broderbund
$59.95 — Ele-Sr. High
Apple II-E, II-C

The computer is used to measure temperature, light, resistance & time in laboratory experiments designed by the user. The data recorded can be saved or printed out. The program is menu-driven and easy to use.

Science Vol. I* — M.E.C.C.
$45 — Jr. High - High School
Apple II

Two programs in this series are marine oriented. One is whale migration which simulates the movement of whales along the Pacific coast. The other is TAG which simulates the capture-release-recapture method of estimating fish populations.

Sea Cliff Erosion — Queue
$34.95
Apple II

Simulates the processes which erode cliffs. The rates of aeriel and wave attack can be controlled by the student and the formation of different cliff structures explored.

Search and Rescue — BBC
17.65 — Jr.-Sr. High
BBC Micro

Simulates decision making in coordination of emergencey services employed in open-ocean rescue operations.

Sharks: Their Nature & Evolution* — Educational Images
$50 — Ele. - High School
Apple II

This is a tutorial program incorporating color graphics to describe and discuss various sharks.

Shore Features* — TYC Software
$25 — Jr. - Sr. High
Apple

This program is a tutorial on the geographical features of the shore and beach.

Simulation Construction Kit* — Hartley
$79.95 — All
Apple II

This program is designed to allow teachers to create their own computer simulations for class use. A demonstration disk, Big Trout National Park Simulation, is available for review.

Stream Meanders and Deltas — CDL
$49.95 — Secondary
Apple II

Color graphics depict stream erosion in a flood plain. A tutorial format is used to present information on typical stream features.

Surface Water — IBM Corp.
$44
IBM

Demostrates how water flows over the surface of the land. The program examines erosion, lake formation, pollution and other topics.

The Ocean Floor* — Prentice-Hall
$60.00 — Grades 7-12
Applr II

An interactive program that provides information on the formation of, features of, and mapping of the ocean floor. The program includes preview, information, and evaluation modes.

The Oceans — J & S Software
$29 — Secondary
Apple II, Laser

This program is designed to teach and review main concepts about the oceans using question/information format. The program includes graphics and a utility program to allow editing by the teacher.

The Scientific Method* — Cygnus
$39 — Jr. - Sr. High
Apple II

Information is presented on the steps in the Scientific Method and the student puts the steps to use in solving a problem. Puzzles, mysteries, problems and questions are used to maintain student interest.

The Sea Voyagers — CBS Software
$39.95
Apple II, IBM, Commodore

Chronicles the discoveries of 30 New World Explorers

The Secrets of Science Island — K-12 Micromedia
$40 — Ele. - Jr. High
Apple, IBM

A survival adventure that motivates students to research answers to science riddles as they build a shelter against an oncoming hurricane.

The Serpent's Coil* — Nibble Magazine
Free (must key in) — Jr. - Sr. High
Apple II

This is a charting program that tracks the path of hurricanes that traverse the Atlantic ocean. You can enter data to plot storms, save the data, or display the paths of storms that are part of the program.

The Skies Above the Waters Below* — Aquarius, Inc.
$115 — Jr. - Sr. High
Apple, TRS-80, IBM

Graphic simulations depict a series of voyages ranging from space to the waterways of Earth. Students learn basic facts and develop vocabulary about each area including streams and rivers and oceans.

The Whaling Game — Queue, Inc.
$60 — Jr. - Sr. High
Apple II

Students represent "whaling nations" which must make decisions regarding the hunting of this resource. Many variables can be manipulated by the participants in this simulation.

Trawlers & Mesh — Queue
$125
Apple II

Models the effect of fishing with fleets of trawlers

Voyage of the MIMI — Holt, Rinehart, Winston
$1000
Apple II

This multimedia educational series uses television, computers and written materials to teach many science topics. Young students aboard a ship are studying whales and their adventures are shared by students in the classroom.

Waqual — Project Seraphim, NSF Project
$7.00
Apple, Atari, IBM, Commodore

Simulates a waste water treatment plant.

Water & Weather Series — Carolina Biological
$89 — Jr. - Sr. High
Apple, Pet, 64, TRS-80

A variety of learning games are used to cover the water cycle and other weather related topics.

Water Education* — VA Water Resources Research Cen
$5.00 — Ele.-Jr. High
Apple II

This disk contains six programs dealing with water use and water conservation. Interactive features and attractive graphics are incorporated in this program.

Water on the Land — Queue
$34.95
Apple II

Simulates the movement and storage of rainwater on land and allows students to set and alter the parameters of the stream model.

Water Pollution
$34.95
CDL
Ele. - Jr. High
Apple, TRS-80, IBM

This tutorial and simulation teaches the basics of water pollution. Students can set up and run water pollution experiments.

Water Pollution*
$30.00
Ed. Materials & Equipment
Grades 7-12
Apple II

This interactive program simulates the effects of several variables on water quality. Students alter variables and the results can be displayed in table or graph form.

Waterfalls
$49.95
CDL
Secondary
Apple II

Illustrates the creation and development of waterfalls through the use of color graphics and animation.

Weather Fronts
$25
TYC Software
Jr. - Sr. High
Apple II

Text and graphic illustrations introduce the structure and characteristics of weather activity. The program includes a test, a review option and manual.

Whale Search
Holt, Rinehart, Winston
3 - 9
Apple II

Logo-like commands move a ship in search of whales.

Whales of the World*
$70
Educational Images
Ele. - High School
Apple II

The program uses a tutorial format to present information on whales. The program is highlighted by color graphics and a quiz.

Wildlife Management*
$5.00
VA. Water Resources Research Ct
Ele. - Jr. High

Apple II

This interactive unit uses a video tape and computer program to study a mountain pond. The computer program is game oriented and deals with fish population levels.

Ecology
$64.95
C.D.L.
9 - College

Apple/IBM

Reviews and reinforces concepts of general, terrestial and aquatic ecology. It is designed to build a working ecology vocabulary.

Shaping the Earth's Surface
$138.95
C.D.L.
7 - 12

Apple

This 4-disk series of drill-and-practice learning games reviews the concepts of weathering, agents of erosion, systems of erosion and deposition, and forces that raise the earth's surface

Estuaries: The Ocean's Nursery
$38.95
C.D.L.
6 - 12

Apple

This interactive program covers the basics of estuaries including the location of major estuaries, estuary food webs, and geologic history. A portion of the program simulates the problems facing migrating fish.

The Balance in Nature
$85.00
Career Aids
6 - 12

Apple

This tutorial program presents an underwater world of animated creatures. Students are asked questions about varying living conditions and the impact on the creatures. Concepts stressed include food chain, adaptation, and species change.

Continental Glaciation
$49.95
Career Aids
7 - 12

Apple

Depicts and introduces terminology relevant to glaciers. Discusses glacial deposits, erosion, and the effects on ocean levels.

COMPUTERS IN MARINE EDUCATION

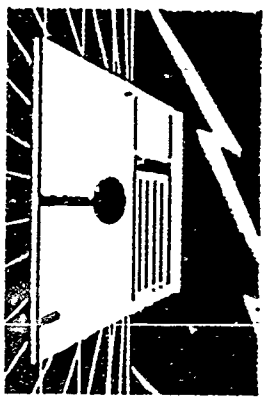
AUGUST, 1987

SOFTWARE REVIEWS

THE REVIEWS INCLUDED IN THIS SECTION ARE FROM PAST ISSUES OF THE NEWSLETTER, "COMPUTER UPDATE," PUBLISHED BY THE COMPUTERS IN MARINE EDUCATION NETWORK.

COMPUTER PROGRAMS AVAILABLE

The Computers in Marine Education Network is now offering a set of public domain computer programs. The programs are on disk and operate on Apple II series computers, 3.3 DOS. Side one of the disk contains three oceanography programs. Included are a word scramble using beach terms, an ocean geography tutorial, and a program that simulates the echo sounding method of mapping the ocean bottom. Side two of the disk is a tutorial program which discusses various salt water fish species. It includes graphic and text descriptions and concludes with a quiz. There is a $7.00 charge for the disk to cover the cost of copying and postage. ($5.00 if you send a blank disk) Checks should be made payable to the Mid-Atlantic Marine Education Association (MAMEA). If you would like further information or would like to request a disk contact:

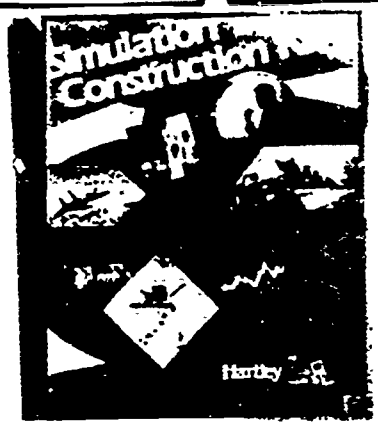


Skip Mclamb
316 Angus Road
Chesapeake, VA 23320

WATER EDUCATION

The Virginia Water Resources Research Center has produced a collection of computer programs dealing with water conservation. Several games and quizzes are included on this Apple compatible disk. "Water Conservation Quiz" uses a series of questions to allow the user to determine his level of water use. A printout summarizing the level of water use and offering conservation recommendations can be generated. "Drowning Man" is designed for younger students and is a take-off on the hang-man game. Players are given a definition and have to figure out the word. Each miss brings a "graphic man" closer to a watery grave. Other programs calculate a family's cost for hot water, determine how much of a person's body weight is water, and for trivia buffs there is "Water Trivia." All five programs are well designed, include graphics and sound, and allow the instructor to change the programs to fit specific needs.

The cost of the program is $5.00. For further information contact Kathy Svevebeck, Va. Water Resources Research Center, 617 N. Main Street, Blacksburg, VA. 24060-3397.



Review

Interactive computer programs that require a student to think can be excellent teaching tools. Programs of this type are called simulations. In general, simulations attempt to model real life problems or situations and allow students to make decisions, predict outcomes, and analyze the results of their decisions. There are commercially marketed simulations that let students dissect cats, study water pollution, examine food web relationships, fly airplanes, or command soldiers in WW III. While many of these programs are excellent, they cannot be designed to meet the specific curriculum requirements of every school division. There is, however, a program currently on the market that teachers can use to design their own simulations.

The "Simulation Construction Kit", marketed by Hartley Courseware, Inc., allows the user to create and run their own simulations. This program does not require computer programming knowledge and includes a comprehensive teacher's guide. Simulations can be developed by the teacher or by small groups of students. Once created, the simulation can be saved and used over and over again. A sample simulation, "Big Trout National Park" accompanies the package. This simulation examines the problem of acid rain and is an impressive example of what can be accomplished with the "Simulation Construction Kit." The program runs on Apple II series computers and costs $79.95. For further information write Hartley Courseware, Inc., 133 Bridge Street, Dimondale, Michigan 48821.

*NOTE: A free copy of "Big Trout National Park" can be obtained by calling 1-800-247-1380.

THE SCIENTIFIC METHOD is a simple, yet effective, program which teaches a student to use logic and common sense to solve a problem. The program follows each step of the scientific method - defining the problem, collecting information, forming and checking hypotheses, and drawing conclusions. Each step includes appropriate problems and puzzles. The scientific method is applied at the end of this program to analyze an experiment. The program also includes a short multiple choice quiz and there is a teacher's manual.

This program is a fine example of how science software should be written. The student is constantly interacting with the computer in evaluating data and situations. The directions are good making the program very user-friendly. The graphics used are designed to accomplish a task, not dazzle the user with artistic ability. Quotations in each section from worthy scientists are a nice touch capping the excellent quality of THE SCIENTIFIC METHOD.

THE SCIENTIFIC METHOD is available from:

Cygnus Software
8002 E. Culver
Mesa, AZ 85207

Requires Apple II, II+, or IIe with 48K RAM, DOS 3.3.

Price is $39.00.

COMPUTER Update

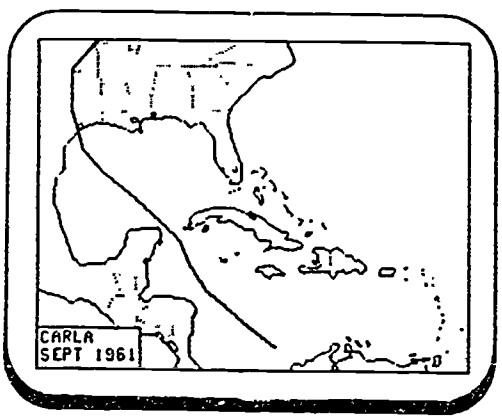
OCTOBER, 1985

THE SERPENT'S COIL

A Graphic Hurricane Tracking System

THE SERPENT'S COIL IS A CHARTING PROGRAM THAT TRACKS THE PATH OF HURRICANES THAT TRAVERSE THE CARRIBEAN SEA AND THE GULF OF MEXICO. FROM THE MAIN MENU, YOU CAN CHOOSE TO DISPLAY THE PATHS OF STORMS FROM DATA STORED ON DISK, OR YOU CAN ENTER THE COORDINATES OF A NEW STORM, PLOT ITS PATH, AND SAVE IT ON DISK. A GRAPHIC MAP, INCLUDING LINES OF LONGITUDE AND LATTITUDE, PROVIDES THE BACKGROUND FOR ANIMATED HURRICANES TRAVELING PATHS DETERMINED BY THE COORDINATES TYPED IN BY THE USER. THE ROUTES OF THE STORMS CAN BE DISPLAYED INDIVIDUALLY OR IN GROUPS. THIS PROGRAM COULD HAVE MANY CLASSROOM APPLICATIONS, ESPECIALLY DURING THE FALL HURRICANE SEASON.

A DETAILED DESCRIPTION AND COMPLETE LISTING OF THE PROGRAM APPEARS IN THE SEPTEMBER 1985 ISSUE OF NIBBLE MAGAZINE. THE ARTICLE ALSO INCLUDES SAMPLE HURICANE DATA FOR EIGHT MAJOR STORMS OF THIS CENTURY. IF YOU PURCHASE THE MAGAZINE AND TYPE IN THE PROGRAM YOU MAY USE IT, BUT COPYING AND DISTRIBUTING THE PROGRAM TO OTHERS WOULD BE IN VIOLATION OF COPYRIGHT LAWS. THE PROGRAM RUNS ON APPLE II+, IIe, AND IIc COMPUTERS.



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316 ANGUS ROAD
CHESAPEAKE, VA
23320

OR

SUSAN WALTON
719 JUNIPER DR.
NEWPORT NEWS, VA
23601

Review

A program that could be very useful to marine science teachers is TAG. TAG allows the user to simulate a population study of fish in a pond. In this program, the computer is used as a tool in an experiment that allows students to tag fish, release them in the pond, then take random samples of fish to calculate the estimated total fish population.

This user-friendly program works effectively, is very interactive, and comes with adequate documentation for the teacher. Materials are included to reproduce as student handouts. Students would need to be introduced to several science concepts prior working with the program. TAG could be used effectively with an entire class, by individual students, or as a station for small groups. It is intended for students in grades 9 - 12. This program capitalizes on the ability of the computer to simulate, in the classroom, an activity that would be more diffilcult to present to students in other ways.

TAG is available as part of a series of science programs included on the MECC Science Volume I disk. Included on the same disk is a program dealing with whale migration. The program operates on all 32K, DOS 3.3, Apple II's and costs approximately $30. Further information can be obtained from:

MECC
3490 Lexington Ave. N.
St. Paul, MN 55112
612/482-3500

COMPUTER Update

MARCH, 1987

Software Review

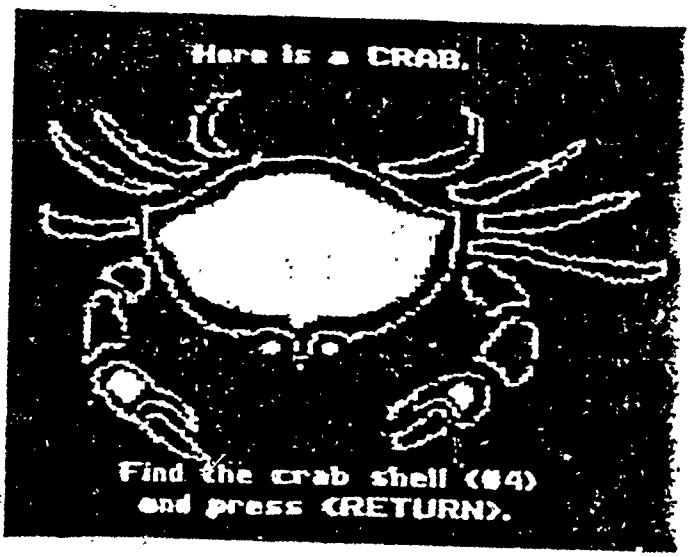
BEACHCOMBING TREASURES

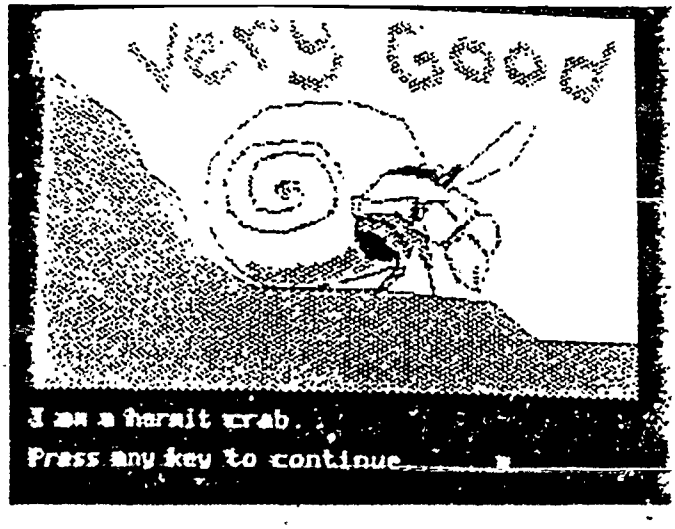
Beachcombing Treasures is described as a "microcourse" for students in grades 3 - 6. The program set is accompanied by a Sea Life Kit which contains a variety of seashells and other aquatic specimens. The computer generates questions which students answer by observing the marine specimens. There are three lessons on the disk. The lesson "Tidepool Animals" presents questions about starfish, sea urchins, crabs, sand dollars, and skate egg cases. Students respond to the questions by observing the specimens. A hand lens is provided to allow close observation. A second program, "Sea Shells", ask students to characterize sea shells and identify them based on distinguishing characteristics. The "What Am I?" program is a quiz game that provides hints so students can guess the identity of one of sixteen sea animals. If the animal is guessed on the first hint the student is rewarded with a color graphic of the creature.

There are many things about this program that I liked. The unique and attractive aspect of the program is the integration of the "Sea Life Kit." The marine specimens are labeled with numbers and referred to by number throughout the program. This hands-on approach helps maintain student interest and enhances the educational benefits of the program.

Technically, the program runs fine. The menu-driven format is easy to follow and the program could be used by early reading students with little teacher assistance. The graphics are of excellent quality. The package would be ideal as an interest center for individuals or small groups. For the price, a teacher could get much out of Beachcombing Treasures. The program could be improved if teachers could easily edi existing questions, or create their own questions for students to answer. Still, for the price, a teacher can get much out of Beachcombing Treasures.

Beachcombing Treasures runs on Apple II computers and is available from Spectrum Software, 75 Todd Pond Road, Lincoln, MA 01773. The price of the program is $25.00 and the Sea Life Kit is $27.00.





COMPUTER Update

JULY, 1985

DUCKS
MECC
3490 LEXINGTON AVE. N.
ST. PAUL, MN 55112
COST: $44

The program DUCKS by MECC was a pleasant surprise. There are two major parts to the program, "Riley's Marsh" and "Name That Duck." The latter program begins with a tutorial on duck identification and information on bag limits and hunting regulations. After the background information is covered the program enters a game mode. The message "DUCKS ARE APPROACHING" flashes across the screen. A description appears, the students quickly read it and decide that of the four choices the pintail is the duck described. As a reward for accurate identification the students get the chance to go duck hunting and take a shot at a flock of birds flying overhead. The computer keeps track of birds that are taken. If the bag limit is exceeded, or a protected species is shot a game warden appears and levies a stiff fine. This program has nice graphics and sound effects. The game element of the program enhances this learning experience.

"Riley's Marsh" deals with state and federal hunting regulations and hunter ethics. This program uses a quiz format. Students are quizzed on ethical, lawful, and safe hunting behavior. As you answer questions correctly you progress through a marsh. The program ends when you reach the opposite end of the graphically produced marsh.

This program is enjoyed by students and adults. An added strength is that it covers unusual subject matter that many teachers do not feel qualified to present to students. You may find DUCKS a useful classroom tool.

THE OCEANS &
STREAMS AND RIVERS
FROM: THE SKIES ABOVE/
THE WATERS BELOW
AQUARIUS PEOPLE MATERIALS
P.O. BOX 128
INDIAN ROCKS BEACH, FL
33535
COST - $115

These two disks use text and graphics to accomplish the task of relating information. Due to the limitations of screen graphics as compared to photographs and the small amount of data that a student can gain by reading a text screen, a textbook would do a better job. In both programs the text appears slowly while much time and noise is spent drawing simple graphic scenes, such as filling in an ocean with water. The format of The Oceans, investigating the ocean depths through a submarine trip, is an interesting approach. Unfortunately, the trip in this program is quite boring and the kinds of data sensed by the submarine's instruments are not realistic. Streams and Rivers follows a similar pattern, but accesses these bodies of water through indistinct maps rather than a submarine porthole. A good book on the topics would be a better investment.

This set of programs also includes disks on The Stars and The Planets.

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316 ANGUS RD. 719 JUNIPER DR.
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WATER POLLUTION
EDUCATIONAL MATERIALS AND
EQUIPMENT CO.
P.O. BOX 17
PELHAM, NY 10803
COST - $30

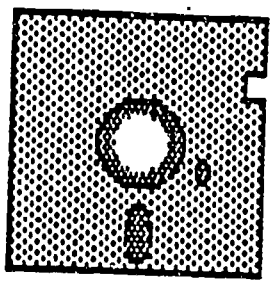
This program is a simple, interactive simulation of the effects of several variables on water quality. These variables include the type of water body, temperature, type of pollution, dumping rate, type of treatment, and number of days monitored. The student is asked to alter the variables and the results can be displayed in table or graph form. Options to print the table and take a quiz are also given. Four experimental situations are provided on accompanying student lab sheets. There is a text and graphic introduction to the program.

The program is an effective simulation, however, directions to run the program and expected student outcomes are lacking. Directions in the manual and on the program are not coordinated well. For example, students use numerals to make choices in the program and letters to make choices on the handouts. The Caps Lock key must be down for the program to run; but, this is not specified in the program. There are other parts of the program in which the directions should be more explicit.

This water pollution simulation has much potential once the teacher and student undestand how it works. With ample preparation it could be an effective tool for a teacher-led demonstration or for an individual student experimenter.

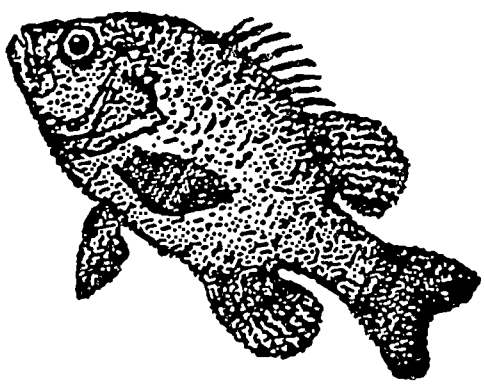
COMPUTER Update

NOVEMBER 1986



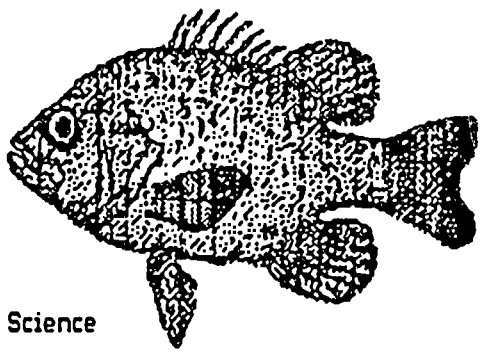
REVIEW - THE OCEAN FLOOR

Over a year ago, Prentice-Hall mailed educators a demonstration disk from their science series. This teaser revealed an approach rarely seen in science software - many screens of quality graphics and animation coupled with sound scientific information. The programs lead the user to make proper conclusions about the material. An order was quickly placed for the marine related titles. This request was placed on back order for the next year.



This program was worth the wait. The software is highly interactive with the user, offering leading questions and suggesting other data to use to make decisions if a mistake is made. The information is separated into three sections - preview, instruction, and evaluation. A menu offers a choice of these three. The preview section familiarizes the user with the program and the vocabulary. In OCEAN FLOOR, the instruction segment offers a selection of ocean floor mapping, ocean floor features, and ocean floor formation. The mapping and features sections utilize a sonar simulation where a research vessel traverses the ocean gathering data. Among other activities, in these two sections the user is able to use the appropriate equation to determine the actual depth from the sonar reading and identify the feature discovered, respectively. (The sonar process is a more sophisticated version of the mapping program on the CME disk, if you are familiar with it.)

The programs are user paced and interesting. The evaluation section offers a test, reteaching and record keeping. Adequate documentation is provided, including an overview and possible student worksheets. The programs are self explanatory and offer helpful advice when you goof. The teacher's guide indicates correlation with the Prentice-Hall textbook series, but use of the series is in no way necessary to use the software.



Prentice-Hall Earth Science Series - OCEAN FLOOR
2 double sided disks and backup disks $60.00

Other marine related programs in the Earth Science series are PLATE TECTONICS, CONTINENTAL DRIFT and HURRICANES. The Life Science series includes LIFE ZONES IN THE OCEANS.

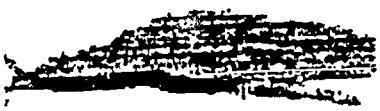
Prentice-Hall Courseware
Englewood Cliffs, NJ 07632
1-800-624-0023

Software Review

COMPUTER PROGRAMS IN MARINE BIOLOGY

WHALES OF THE WORLD: GREAT AND SMALL (C 3005)* NEW 1984

A detailed, menu driven tutorial surveying whales and dolphins. Differentiates between baleen and toothed whales, great whales and dolphins. Striking color graphics of each species make differences and similarities clear. Presents description, biology, historical information and threatened status. Quiz questions reinforce learning and ensure students pay attention. *Apple only. Free back-up provided.* $69.95



SHARKS: THEIR NATURE AND EVOLUTION (C 3006)* NEW 1984

A detailed, menu driven tutorial introducing the evolution and biology of sharks. Separates fact from myth about: great white, mako, thresher, hammerhead, tiger, nurse, basking and whale sharks. Many striking color graphic screens supplement text and provide perspective. Quiz questions after each species description reinforce learning. *Apple only. Free back-up provided.* $49.95

CORAL REEFS AND THEIR RESIDENTS (C 3007)* NEW 1984

Tutorial provides a detailed introductory survey of coral reef biology. Presents the characteristics of coelenterates, different types of reefs (fringing, barrier, atolls), differences between hard and soft coral, and introduces such terms as zooplankton, nematocyst, madreporite and gorgonian. Includes many animated color graphics and a 10 question quiz. *Apple only. Free back-up provided.* $39.95

OCEAN TIDES AND CURRENTS (C 3008)* NEW 1984

A two part tutorial outlining the factors producing both tides and ocean currents, illustrated with many colorful, animated graphics. Outlines the four major forces producing tides (gravitational pull of the moon, spinning of the earth, gravitational pull of the sun, shape of the shoreline basin) and the factors causing ocean currents (coriolis force, placement of continents, winds), explains spring and neep tides and surface, benthic, temperature and density currents. Details the 10 major planetary currents and introduces a variety of technical terms (perigee, apogee, apehelion, sidereal, diurnal, etc.). *Apple only. Free back-up provided.* 69.95

SAVE 20% ALL FOUR PROGRAMS (C 3005X) $199.95

**Demo available. See page 1 for important information.*

The four programs described on the left have recently been reviewed. The program descriptions are accurate; the programs are well written, user friendly tutorials. It is a strict tutorial format with very little user interaction which made it difficult for the program to hold my interest. In many instructional situations, other teaching methods could be as effective or more effective than the computer programs. The program graphics are good, but far from great. The programs could be useful but should be carefully reviewed before purchasing.

The publisher is:
Educational Images Ltd.
P.O. Box 3456
Elmira, NY 14905

Join the Network

THE COMPUTERIZED MARINE ED. NETWORK IS DESIGNED TO ENCOURAGE THE USE OF COMPUTERS IN THE TEACHING OF MARINE TOPICS. FOR MORE INFORMATION ON THE SERVICES OF THE NETWORK WRITE:

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Blacksburg, VA 24060
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VENTURA EDUCATIONAL SYSTEMS
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COMPUTERS IN MARINE EDUCATION

COMPUTERS IN MARINE EDUCATION

A network is now established for individuals interested in the use of microcomputers in marine education. The purposes of the network are:

TO REVIEW AND CRITIQUE COMMERCIAL AND PUBLIC DOMAIN SOFTWARE APPROPRIATE FOR MARINE EDUCATION.

TO SHARE TEACHER PRODUCED, STUDENT PRODUCED, AND PUBLIC DOMAIN SOFTWARE ON MARINE RELATED TOPICS.

TO ENCOURAGE THE EDUCATIONAL USE OF COMPUTERS IN THE TEACHING OF MARINE TOPICS.

For more information on the services of the network write:

Skip McLamb
316 Angus Road
Chesapeake, VA 23320

Susan Walton
719 Juniper Drive
Newport News, VA 23601

The following articles are concerned with using computers in marine education.

"Using Computers in the Marine Science Classroom," The Journal of Computers in Mathematics and Science Teaching, Fall 1985, pp. 38 - 43.

"Getting Your Feet Wet in Iowa," The Computing Teacher, February, 1986, pp. 25 - 26.

"Computer Technology in the Classroom -- Educational Programs," Marine Resource Bulletin, Spring 1986, p. 12.

"Energy Relationships in Aquatic Environments: A Computer Approach," Science Activities, March, 1987.