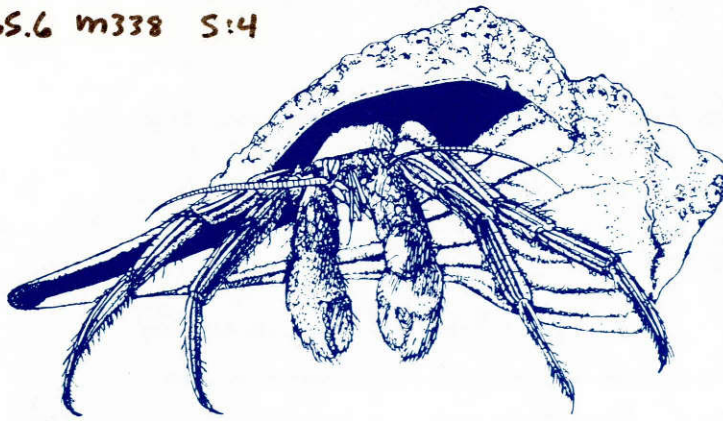


NON-CIRCULATING



Marine Education

A COOPERATIVE EFFORT OF THE TEXAS A&M UNIVERSITY SEA GRANT COLLEGE PROGRAM AND DEPARTMENT OF EDUCATIONAL CURRICULUM AND INSTRUCTION

Three students share Sea Grant science awards

Three College Station, Tex., students received Sea Grant Awards at the Regional Science Fair held at Texas A&M University in late March. One, Mike DeArman of A&M Consolidated High School, also won Best of Fair honors and will represent the region at the international science fair in May.

The Texas A&M Sea Grant College Program usually selects two exhibitors, one from the senior division and one from the junior division, who demonstrate outstanding achievement in marine-related projects each year. DeArman's project, "The Olfactory Inhibitors in Drilling Fluid," received the senior division award, while Angie Giammona and Darcy Brooks, both of A&M Junior High, shared the junior division award.

DeArman's project was a continuation of a study that enabled him to attend the international fair last year.

(See Awards page 7)

May 12-18 designated National Science Week

To increase public awareness and understanding of science and technology, Congress has designated May 12-18, 1985, as the first National Science Week. Through a diversity of science, technology and math-related activities, National Science Week is designed to encourage students to study science, as well as to enhance the general level of the public's understanding and appreciation of science.

While National Science Week is structured to reach many segments of the general public, its primary aim is to communicate with those who will be the scientists, researchers, engineers, teachers and citizens of the future. Present students are in an age of technology when most careers, and even day-to-day activities, will directly involve working with, understanding and living comfortably with science, mathematics and technology.

National Science Week is a joint

partnership between the federal government, industry, professional societies and associations, community groups, educators and other organizations. The National Science Foundation has developed the overall theme for the week, and serves as a clearinghouse of information to help schools or organizations tie their activities into the national effort.

Schools are being encouraged to participate by sponsoring or initiating such activities as —

- Science contests and Olympics, including poster or essay contests, "Science Trivia Bowls," or other competitions.
- Seminars, symposia, lectures, "hands-on" workshops, audio-visual presentations or speeches.
- Science fairs or special science demonstrations.
- Visiting speakers programs, invit-

(See National page 4)

Several summer courses available for teachers

Texas teachers have a number of educational opportunities this summer, either in regular summer sessions or in special short courses scheduled at several of the state's universities. Two courses are offered during the first summer session (June 4 through July 10) at Texas A&M University, **Marine Biology** and **Survey of Oceanography**. **Special Topics in Marine Education**, the three-week graduate course offered through the Department of Educational Curriculum and Instruction in conjunction with the Sea Grant Program and Texas A&M University at Galveston, is July 12 through August 1.

Marine Biology (BIO 440), taught
Vol. 5 No. 4 May 1985

by Dr. Mary Wicksten, is a general course that emphasizes marine environments and their inhabitants along the Texas coast. Plants and animals are presented in the context of their natural habitat; general ecological concepts are stressed rather than memorization of names. The laboratory work includes a field trip to marine habitats along the northern Texas coast.

The prerequisites for the course are a class in introductory biology and an ability to handle upper division course work. The course is open to non-majors in general science education, geology, wildlife and fisheries sciences, and related disciplines. Further information is

available from Dr. Wicksten, Department of Biology, Texas A&M University, College Station, Texas 77843 (409/845-3388).

Survey of Oceanography (OCN 600) is designed for graduate, or upper level, students. Capt. T.K. Treadwell devotes approximately half the time to an overview of the basic principles of oceanography and the remaining time to applying these principles to practical uses. A minimal background in the sciences and math is required; the course is concept-oriented. Each application is treated as a separate topic entity, from pollution to fishing and energy to coastal management.

(See Course page 8)

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Year of the Ocean 1984-1985

The wave of the future?

Editor's Note — Since we began in February 1981, we have tried to keep our readers informed about state and national issues that affect marine education. This coverage has included progress reports on the Administration's attempts to curtail or eliminate many marine-related programs and projects in order to reduce the federal deficit or to expand state responsibilities for marine resource management.

*The following editorial provides one interpretation of these efforts and should be of particular interest to those concerned about the future of marine education. It was written by Christopher du Pont Roosevelt, president of the Oceanic Society, an organization dedicated to the protection of the world's oceans through research, education and conservation. It originally appeared in the March-April 1985 issue of **Oceans**, and is reprinted with permission of the author.*

Editorial

We are now deep into the "Year of the Ocean," so proclaimed by President Reagan in July 1984. To quote from the president's proclamation:

Today, the ocean has become even more important to the people of our Nation—as a source of petroleum and minerals and an avenue of foreign trade. In addition, the ocean is a constant source of employment

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Marine Education is to inform elementary and secondary teachers about current research and activities in the marine environment. Amy Broussard, editor; Bonnie Blackburn, marine education coordinator.

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for hundreds of thousands of Americans each year.

This Nation is the steward of the resources of the ocean.

Our increased use of the ocean requires that we work to protect this resource effectively and efficiently. In order to do so, we must educate Americans concerning the role of the ocean in our lives and our responsibility to match increased uses of marine resources with vigilant efforts to preserve the ocean environment for the benefit of future generations.

So much for rhetoric.

The praiseworthy goals of that apparent commitment are now in trouble. During much of 1984, and now in 1985, the White House and the president's Office of Management and Budget have done everything possible, and then some, to cut or rescind funding for many of the nation's most important marine programs. The president's recent budget proposal for fiscal year '86 calls for the National Oceanic and Atmospheric Administration (NOAA) to spend \$200 million less than its 1985 budget, representing nearly a 17.5 percent cut. Within NOAA, ocean and coastal programs would absorb 27 percent of the cuts, with the administration seeking to eliminate federal funds for state coastal zone management, the undersea research program, the regional ocean pollution program, the Sea Grant College Program, the estuarine and marine sanctuary programs, and on and on.

More serious is the president's request that Congress rescind many existing appropriations for the current fiscal year, which ends on 30 September. For NOAA this would involve cutting nearly \$37 million in state grants for coastal management, \$19.5 million from the National Sea Grant College Program, and almost \$34 million designated for a second polar orbiting satellite.

The contrast between the president's July '84 proclamation of the "Year of the Ocean" and his budget-slashing efforts is striking. On the one hand, he is saying,

"Let's promote understanding, protection, exploration and development of the oceans much as we did for space two decades ago." On the other hand, he is not only holding back but drastically cutting available funding to do so. With a contradiction that obvious, perhaps the president ought to reassess his proclamation of the "Year of the Ocean" and be more forthright about his commitments.

One of the most important pieces of resource management legislation ever enacted by Congress, the Coastal Zone Management Act (CZMA) of 1972, is up for reauthorization in 1985. Most observers expect a major battle over extension of this law between conservationists and coastal management advocates on one side and the Reagan administration, land developers, and the oil industry on the other. The original purpose behind CZMA was to stem the destruction and development of critical coastal resources like salt marshes that were being lost at an alarming rate. Congress found then an "urgent need to protect and give high priority to natural systems in the coastal zone." That same need exists today.

A system of voluntary participation by the states in developing and managing their own programs was stimulated by federal matching grants to the states. Twenty-eight of the thirty-five coastal states and territories have federally approved programs in place, and several other states are still in the process of program development. Virtually all of the states with operating coastal management programs rely heavily on federal matching funds to continue the programs. The association of states with coastal programs, the Coastal States Organization, attests to the need for federal support, stating, "without adequate financial resources, it would be impossible for the states to continue to play a leading role in the administration of their coastal zone management plans."

There is no denying that our
(See Year page 8)

Prof. John E. "Jack" Flipse, associate vice chancellor of engineering for The Texas A&M University System and associate dean of engineering at Texas A&M, assumed the chairmanship of the National Advisory Committee on Oceans and Atmosphere (NACOA) in March. President Reagan appointed Flipse to the panel in January.

NACOA was established to advise the President and Congress on national ocean and atmospheric policy, coastal zone management, and marine and atmospheric science and service programs of the United

States. Its 18 members are appointed to three-year terms by the President. NACOA's assessments and recommendations are provided in an annual report as well as through special reports, position statements and direct correspondence. Committee recommendations also are presented through testimony at Congressional hearings.

Flipse had attended one committee meeting prior to being interviewed for this issue. The following is an edited transcript of that interview.

Flipse assumes position as NACOA chairman

Q: You have now been confirmed as chairman of NACOA?

A. Yes, I was sworn in early in March by Dr. (Anthony J.) Calio, who is the deputy acting administrator of NOAA and its senior officer. NACOA is a presidentially appointed body that reports to the President and, according to the original guidelines, to the Congress on issues that either the President, Congress or the membership suggests it should consider. The relationship with the Department of Commerce is just that some executive-level department provides staff and procedural support. We aren't part of the Department of Commerce, but it is called NACOA's cognizant agency.

Q. The current budget proposal includes substantial cuts in NOAA's budget, and, as I understand it, these cuts would do away with NACOA.

A. That's been true for the last three years. The continuing resolution is the one technique that has perpetuated the dual fate for Sea Grant and for NACOA. This lack of executive-level support is a major concern of mine. As an independent group, NACOA basically should be loyal only to our objectives, to the nation, to science, and to the truth in the issues. In fact, however, we have an additional obligation because if we don't please the Congress they won't add us back as a line item in the NOAA budget. Therefore, we would be unfunded and have to close the doors.

When my nomination was discussed, I raised that fact with the President's staff. I asked how NACOA could effectively serve the

country and the President if it were dependent on the good will of Congress. Isn't our independence somehow compromised? The staff's answer was yes; they also said they would try to have NACOA as a line item in the budget proposed by the Executive Department. That's swell, but it's too late for 1986. I was told the staff intended to do it for 1987, but I couldn't extract a written, concrete promise anymore than you can get one for Sea Grant. The basic argument is the one you raised. Why should I devote my time and energy to serving in this organization when in fact every indication is that the government doesn't want it. I said this to the President's staff. Their answer was that the President wanted me to serve and hopes that we can make NACOA more effective so he will want to keep it. It's the chicken and the egg story all over again. I'm willing to let the President be the chicken and I'll be the egg. I'm not going to tell him I wouldn't serve. I figure it is better that I serve than someone less competent, although I would have deferred to someone more competent in a minute. It is a time-consuming, demanding activity.

I think some of these remarks are true also for Sea Grant. Wouldn't you feel much better if the Executive Department recommended and then Congress approved or tailored the budget to suit the real needs as they perceive it rather than have the Executive Department zero it and then have Congress nail it back in? Now, in fact, you are much more responsive to Congress than you are to anybody else. We find ourselves in

the same strange dilemma, when, in fact, the first thing that comes in our charge is that we are acting independently, as independent experts.

Q: As of July 1, there will be six vacancies on NACOA. Have you received indications that there will be people nominated for these vacancies?

A: One of the issues that I raised when I was invited was that these should be filled promptly with qualified people. That's a sensitive issue. Although some members of NACOA now and in the past have been identified as close acquaintances or even friends of the President, in general the administrations have been careful to pick people who are qualified under the basic description of who should serve. There are no clear cases of incompetent people being put there on a buddy system. Each individual, even though he may not be a marine scientist or she may not be a marine engineer, represents other issues which include the environment and the impacts that NACOA can have on the public good. They are involved and concerned citizens. I'm not sure I'm going to get along with all these people for my tenure there, but it is improper to categorically criticize people because several segments have to be represented. We have more people with marine and ocean experience than with atmospheric experience, but the few people who do not have a strong technical background are basically very interested in environmental things or things that are of keen interest to the public as a whole.

In answer to the question, I made the pitch that the vacancies be filled with capable people as soon as possible. The rule is you serve until replaced, so some people have had four- or five-year terms. They haven't really been reappointed, so they feel as if they are leftovers. This, I feel, is detrimental to the functioning of the body. I assured the staff that I will consider anyone left on the committee as being left there on purpose. On the other hand, I made the pitch as part of my "negotiations" before I took the chair that the President would, in fact, promptly replace members or renew their terms so that they serve equally with the others.

Q: Do you feel that either naming new nominees or reappointing people would be an indication of President Reagan's intention to support NACOA?

A: Yes. I think it would indicate

his support of NACOA, and the more promptly he does it, the clearer that indication will be. That's another argument that I advanced in my discussions.

Q: One of the criticisms recently of NACOA is that it basically represents developmental interests rather than environmental interests. You, yourself, have very strong environmental interests from what I understand about your background.

A: I also have developmental interests, though. The people on NACOA aren't there to murder the environment to make \$2, and that's the inference of some criticisms. They are there because they can contribute to the deliberations of a great many things that go beyond the environment, but the environment is not neglected. In this day and age, no one in his right mind gets into the position where he is deliberately attacking the environment in this type of activity.

Q: Do you think some of the more outspoken environmentalists get more press or create more of an uproar than those developers who see the value of marine resources, but understand that they need to retrieve these with the least disturbance to their surroundings?

A: I used to feel that way, but I think it's getting in much better balance as time goes on. There were traditions where you dug up the land and worried about the environment later. Fifteen or 20 years ago, this probably was a severe problem. The hue and cry has been substantial in the last 10 years. There are good environmental laws on the books now. People have found it is probably much more politic and sensible to adhere to those laws and

National . . .

(Continued from page 1)
ing scientists or engineers into the classroom.

- Special awards to outstanding contributions in science, such as holding an awards ceremony honoring local "science achievers."
 - Community ecology or science projects that involve parents, teachers, local businesses, and state and local officials.
- NSF is distributing activities kits for National Science Week, including brochures, a poster, science quizzes and sample experiments. Further information is available by calling NSF's toll-free number, 1-800-INVOLVE.

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there really isn't much economic advantage to breaking them anymore. That's the real point. It costs more to break them. Therefore, there isn't normally an adversarial position between the developer and the environmentalist. The environmentalist is the hair-shirt or pebble in your shoe to remind you — hey, you're getting close to the line sort of thing, but it has lost its newsworthiness so some extent. Environmentalists and developers have come to respect each other. Environmentalists aren't all crazy and walk on their hands, and developers aren't all monsters who intend to go out and tear up everything. There is an

"...hired a neck-sticker-outer"

accommodation that develops between them over time in a normal sort of fashion. I think this accommodation will be accomplished in just a generation or two, not over a century or more. It's very close to being accomplished now.

Q: When you were appointed, you said that the problem with the seals and whales was one that you felt would come to a head very soon. Is this something with which NACOA can deal?

A: At my first meeting, we approved a report on the Alaska fur seals with minor editorial corrections and sent it to the President. In my opinion, it is an excellent report. Charles Black, who chaired the panel, devoted probably half his time for two years to do it. It was a very interesting type of an issue, one you could study forever.

Q: What other issues do you anticipate?

A: We probably have three or four more at the moment. One is what to do about the development of the Exclusive Economic Zone. That's a potentially loaded gun and we've just started on it. Another tough one coming up is on shipbuilding and ship operation and how it supports or should support our national security. There's never been any agreement in the United States on this. A draft report has been circulated, and we have polarized reactions that are tremendous.

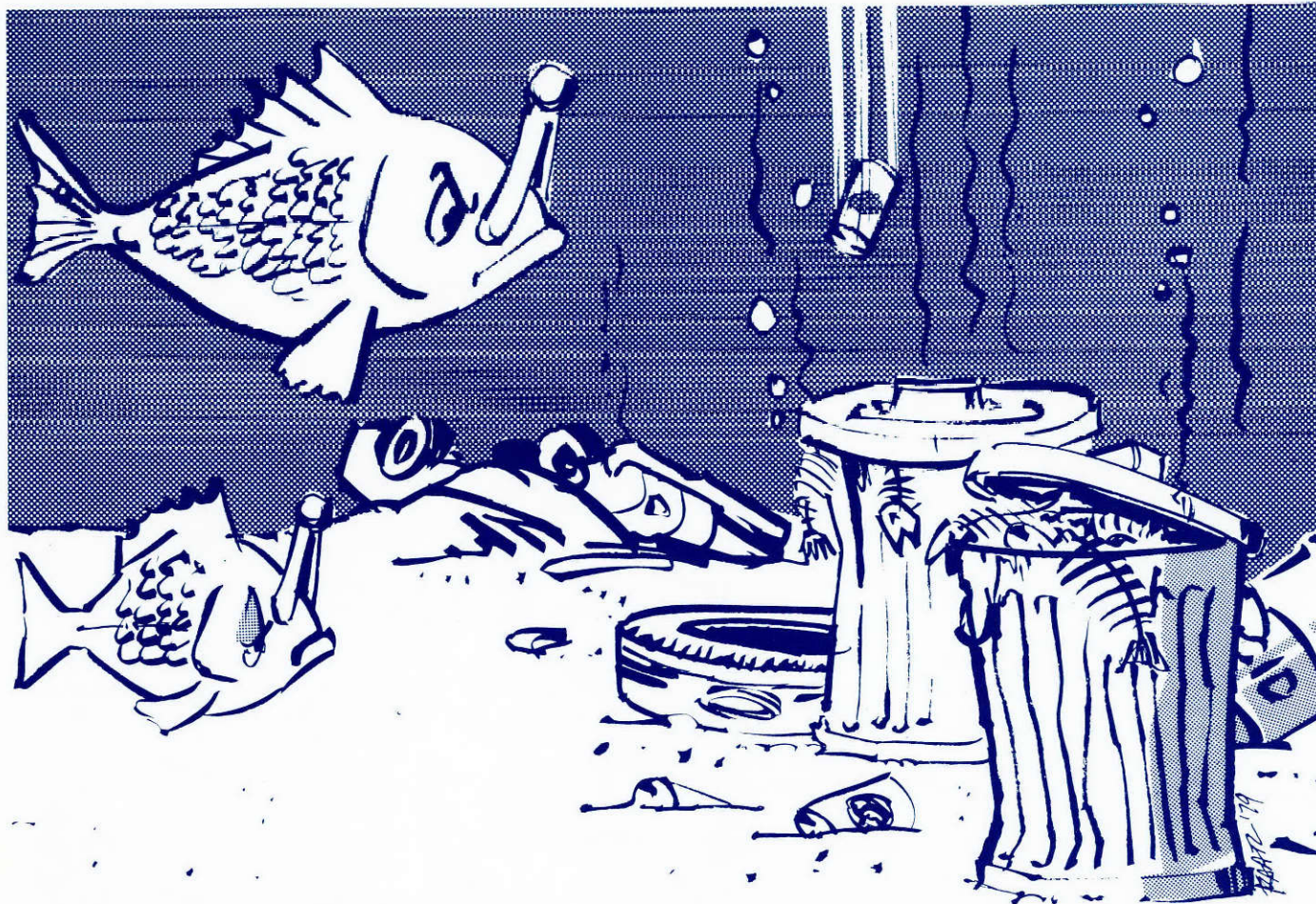
The other issues are of less prominence. I've told the committee members that I would like them to

identify issues. It would be especially appropriate then if Congress or the President comes in and asks that we examine a certain problem and we can show that we've already discussed it. It also means we can set our own priorities. It will show that we are alive and thinking, that we can actually come up with something instead of reacting to someone else's problem. Another thing is that if we put that kind of energy into a report or study that we initiate, the membership will feel there is more elbow room on the committee. We won't have to wait for requests, we can show initiative. I'm especially interested that we pick a subject that

is interesting, has enough technical context so that we're the appropriate body to deliberate on it, and where we can come up with something worthwhile, even if it doesn't represent the popular thinking. This would certainly meet my end of my promises to the President's staff that NACOA would do thorough jobs, objective, honest and let the chips fall where they may. I also told them I didn't see that we (NACOA) were beholden to anyone and that if we are to really do something worthwhile for the country then we ought to have this elbow room. So I would like to develop one of these studies in the next year or two to demonstrate that the committee's got its own brain as well as legs to come when it's whistled.

Q: Do you feel that has been part of the criticism of the committee?

A: In some quarters, yes. Another criticism has been that they never focus. They talk about the issue until they're blue in the face. They raise all the points and they don't focus on what's the real problem and what should we do about it. They quit short of sticking their necks out. Well, they hired a neck-sticker-outer. They're going to stick their necks out with me or we'll all get them cut off. We aren't going to be able to be accused anymore of a non-focused report or failing to reach a conclusion. It (NACOA) may be terminated, but my personal feeling is that if we can't do that type of job, then it ought to be terminated. There's no point in just stirring the pot endlessly.



Litter...polite name for pollution

There is a cartoon character named Woodsey used in public service announcements to tell children "Give a hoot. Don't pollute." Children, and adults, respond to this message positively—nodding their heads solemnly and assuring one and all that *they* don't contribute to the pollution problem.

If *they* don't, someone does.

Unfortunately, most people consider pollution to be "someone else's" fault. The word "pollution" somehow conveys images of a major occurrence—an oil spill, chemical dumping, a fish kill. Dropping a paper cup or a potato chip bag on the beach or in the surf isn't pollution—that's just a convenience when there isn't a nearby trash can. Besides, that's litter, not pollution, and everyone knows litter isn't a big problem.

But litter is. Beach litter has reached such proportions in Texas that Gov. Mark White asked the Tex-

as Coastal and Marine Council to study the problem and make recommendations for feasible solutions. Their subsequent report discusses the problems, origins, laws and enforcement, abatement, and an evaluation of the beach cleaning maintenance program.

Gov. White's action is not just altruistic. The third largest industry in Texas is tourism, and this industry is feeling the effects of beach litter. Coastal visitors are quite vocal in expressing their disapproval of beach litter. They complain to coastal park managers, and some even vow never to return. Tourism was a \$14 billion industry in 1983. Any threat to the economic well-being of this industry is certain to attract attention.

Beach litter has two major sources—the Gulf of Mexico and the land. Litter from the Gulf comprises 75 to 90 percent of the total, while the remaining 10 to 25 percent is

deposited by beach visitors, campers and persons using the beaches as dumpsites.

Much of the debris on the beach is natural, including some of the oil. This litter includes some natural products, such as trees, driftwood, fish, birds, shells, sargassum weed and other animals. These natural materials are brought from many other parts of the world to the Texas coast by major ocean currents such as the Gulf Stream. During the spring, the direction of flow of the currents is changing and the water offshore is relatively still. At this time, the many kinds of debris that are in the current are pushed ashore by wind and surf. This type of debris draws few complaints. People seem to accept this as a natural part of the beach scene. It is the man-made debris that causes the problems. Man has used the oceans as a dump for years and his trash will be carried

(Continued on next page)

Marine Facts

onshore by ocean currents for many years to come.

Although little actual documentation exists to prove the claim, findings indicate that most of the litter that washes ashore comes from international commercial vessels and offshore oil and gas platforms. There are both federal and state laws to regulate both pollutant discharge and solid waste disposal by either ships or platforms, but these do not apply to operations beyond the 12-mile limit. For example, foreign vessels entering U.S. ports may not offload solid wastes unless the wastes are incinerated or steam sterilized and conveyed to approved landfills. This law is intended to prevent importation of insects or diseases from other countries, but it may be causing vessels to dispose of solid wastes in international waters. No survey or research has been available to prove or disprove such a premise, but prevailing opinions indicate that the general practice of vessel operators is to hold wastes while in port and dump them offshore. When the currents are right, those wastes find their way to the Texas coast regardless of the regulations.

We may be more aware of the litter problem today because of the permanence of some types of litter. The widespread use of plastics throughout the world is a case in point. The non-biodegradable nature of plastics guarantees that these items remain in the environment virtually indefinitely. Discarded plastic items are visually unattractive to people—but they are deadly to birds, fish and mammals. There are more and more recorded instances of turtles, sharks and mammals dying from ingestion of plastic bags. As severe as the problem is along the Texas coast, it must be even worse in Italy where the government is in the process of enacting a law that bans the use of plastic bags by 1991.

Unfortunately, most mechanized methods of beach cleaning are very destructive to the beach and to the life forms that live there. Those methods that are not destructive are ineffective. Hand labor is the most effective method, but neither the state nor the individual counties can possibly consider this as a viable option. Beaches that draw the most visitors are cleaned regularly; others are left to nature. High tides associated with severe storms usually clean most of the beach several times each year, burying the debris

or carrying it back out to sea to be redeposited somewhere else. Neither of these procedures are true solutions.

There are no easy, or inexpensive, solutions. Educating visitors and the general public on the virtues of clean beaches will take time, effort and money. Moreover, these groups account for no more than one-fourth of the problem. A comprehensive public awareness campaign targeted for oil and gas companies, and operators of pleasure boats, service boats, commercial fishing boats and international trade vessels also is needed.

The Texas Coastal and Marine Council's report concludes that building a solid program to combat litter on beaches cannot be accomplished in a vacuum. Litter is a worldwide problem and ocean dumping of wastes must be curtailed throughout the world. Even though making changes in international ocean dumping laws will take years, more effective enforcement practices and stricter international laws prohibiting ocean dumping are essential if the war on litter is to be won. Texas, the Council noted, should take appropriate actions to urge federal agencies and responsible administration officials to initiate efforts for stricter international laws on littering.

Further Reading

Litter on Texas Coastal Beaches: Status Report and Recommendations. Austin, Tex.: Texas Coastal and Marine Council (P.O. Box 13407, Austin, Tex. 78711-3407), January 1985.

The Health of the Oceans, Edward D. Goldberg. Paris: The Unesco Press, 1976.

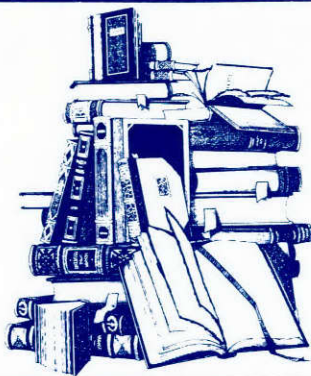
Ideas for the Classroom

Procedure

1. Just for today, you and your classmates form the nucleus of a public service advertising agency. Your client has asked you to develop a campaign to combat beach litter. This includes designing posters, letters, campaign buttons, and radio and TV spot announcements.
2. The class as a whole should decide on a general theme for the advertising campaign. This might include a catchy slogan, and possibly sub-themes for specific audiences. Divide the class into groups and assign one phase of the advertising campaign to each group.
3. **Poster group**—Design an 11 x 17-inch poster that stresses the overall theme of the campaign in a way that will attract attention.
4. **Letter**—Compose letters directed toward major factories, oil and gas companies, the shipping industry, local Chambers of Commerce, and others who should be aware of the campaign and whose help you want to solicit.
5. **Campaign Button group**—Everyone has seen political campaign buttons. Design a button that stresses the general theme of your advertising campaign. Remember a button is not too big, so keep your message short and to the point.
6. **Radio and TV Spot group**—The local media is providing time between regular programs for public service announcements. These spots can be either 30 or 60 seconds long. You can use words only or combine words and music for radio, or music, charts, photos and words for TV. Remember to time your spots so the stations will not cut you off.
7. There are other ideas that can be included in your advertising campaign, and complete campaign ideas may well be of interest to those who are now dealing with the problems on Texas beaches. If copies of the completed campaigns are sent to *Marine Education*, they will be forwarded to the appropriate officials.

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books & things



The University of North Carolina Sea Grant College Program recently published **Coastal Capers**, by Lundie Spence and Vivian Barbee Coxe, a marine education primer to provide elementary teachers with activities or "capers" that introduce the marine environment. The primer also may be used by teachers with remedial or special education students, or by 4-H and Scout leaders. The 20 capers are designed to motivate students to learn basic skills in science, math, language arts, social studies and art.

The illustrated primer costs \$3.50 and also includes easy-to-copy patterns, a glossary and suggestions for additional marine education materials and activities. It is available from University of North Carolina Sea Grant College Program, 105 1911 Building, Box 8605, North Carolina State University, Raleigh, N.C. 27695-8605. Specify UNC-SG-84-05.

Arrow Books, a division of Scholastic, Inc., has just published **What's Down There? Questions and Answers About the Ocean** by Dinah Moche that is a good, easy-to-read reference book for any classroom. The small paperback (7 1/2 x 5 1/4) is formatted with one question, and its answer, per page. It covers such topics as the land and the water, the deep blue sea, animals and plants, and you and the ocean. The material is useful for upper elementary through adult — although the answer to the very first question (How many oceans are there?) may prove surprising to a number of teachers and students alike.

What's Down There? is available for \$1.50 through bookstores or may be ordered from Scholastic, Inc., 730 Broadway, New York, N.Y. 10003.

Although this column does not generally offer free advertising

space, Mattel has come out with a new stuffed animal that merits mention. The animal is Snuggles the Seal, a small, stuffed seal complete with sweater and stocking cap. What makes this different from other toys is that for every Snuggles that is sold, Mattel will make a donation to The Humane Society of the United States to help stop the slaughter of seals. Purchasers need only mail the hang tag to Mattel and the donation will be made.

"The Chesapeake: Prologue to the Future" is the theme of the 1985 National Marine Education Association Conference at The College of William and Mary, Williamsburg, Va., July 30 through Aug. 3. This year's conference is co-hosted by the Virginia Sea Grant College Program, Virginia Institute of Marine Science (VIMS), The College of William and Mary and the Mid-Atlantic Marine Education Association.

Conference organizers selected the theme in the hope that an understanding of a modern estuarine complex will serve to promote responsible management of the natural resources of all estuaries. High on the nation's list of priorities is excellence in education and the Chesapeake Bay, since President Reagan has declared the Bay a national concern. The Governors of Virginia and Maryland have committed millions of dollars to the Bay clean-up and to educating the public concerning its importance. In addition to the typical information sessions and field experiences of an NMEA conference, a Chesapeake Bay Symposium will feature up-to-date research findings by prominent VIMS marine scientists.

Further information on the Conference is available from Sue Gammisch, Virginia Sea Grant Marine Education Specialist, VIMS Advisory Services, Gloucester Point, VA 23062, or by calling 804/642-7169.

Awards

(Continued from page 1)

In the original study, he established that the drilling mud that leaches into ponds located near oil wells can block the sense of smell of some fish in the pond. This year, he isolated the substance in the drilling mud that causes fish to lose their sense of smell, and he tested the mosquito fish, a species introduced to area ponds because they eat mosquito larvae.

DeArman determined that bentonite clay is the substance in the drilling mud that affects the fish. He found that the effect on the fish is temporary; when the contamination clears, the fish can sniff again. Since fish depend on their sense of smell to find food, an affected species of fish can disappear rapidly from a contaminated pond.

Giammona and Brooks, both eighth graders, submitted projects entitled "How Pollutants Affect Micro-Organisms in Pond Life" and "The Salinity of College Station Tap Water," respectively.

Giammona collected water samples from a pond near her home to test the effects of varying concentrations of common pollutants — gasoline, fertilizer, insecticide and detergent. She performed bioassays on the contaminated water to demonstrate the effects of the pollutant concentrations on pond life.

Brooks' project also concerned water, specifically the drinking water in College Station, Tex. During a 30-day period, she drew daily water samples to determine the salinity and recorded the corresponding air temperature, rainfall and water consumption. She found that the average salinity was 1 to 2 percent of open ocean water, and that the salinity varied 20 percent up and down during the testing period. She further determined that the salinity variances correlated with air temperature, which, in turn, was an alias for water consumption. As the temperature rose, consumption increased, and, with it, the salinity level increased.

Courses . . .

(Continued from page 1)

Special supplemental information (slides, reference materials, lab suggestions, etc.) are available for those involved in teaching earth or marine science at the pre-college level.

Special Topics in Marine Education is limited to the first 35 applicants, either teachers or graduate students. Students will earn three hours of graduate credit.

Further information on any of these courses is available through Texas A&M's Admissions Office or by contacting the Marine Education Program, Texas A&M University, College Station, Tex. 77843-4232.

Corpus Christi State University

Corpus Christi State University has a number of summer courses for teachers, headed by **Marine Science Teachers Workshop**, an 11-day advanced topics course taught by Dr. Wes Tunnell, professor of biology and marine biologist. The class is designed to introduce elementary, junior high and high school teachers to the biology and ecology of the common organisms inhabiting estuarine and marine communities, particularly those along the Texas coast and in the Gulf of Mexico. Emphasis will be on equipping teachers with lecture and lab knowledge concerning general aspects of the marine environment, available marine science teaching materials, and with field trip possibilities. There will be field trips into the Gulf, to Redfish and Corpus Christi Bays, and to Laguna Madre, shoreline trips to oyster reefs, sea-grass beds and salt marshes, and visits to the Texas Parks and Wildlife Marine Lab, The University of Texas Marine Science Institute and the Texas A&M University Mariculture Facility.

The course will be from 9 a.m. to 4 p.m. daily, July 9-19. Further information is available by contacting Dr. Tunnell at the CCSU Biology Department, 512/991-6810.

CCSU also offers two other summer field studies in biology. **Padre Island Ecology** (BIO 302/6 hours) offers a broad overview of the physical, geological and biological features of Padre Island, Laguna Madre and the Gulf of Mexico. The course will be during the first summer session, June 3 through July 3. Inquiries should be addressed to Dr. Bart Cook or Dr. Brian Chapman, at 512/991-6810.

8... Marine Education

A second course, **Coral Reef Ecology**, offers students an opportunity to study coral reef organisms and ecology in lecture and lab at CCSU and in the field near Veracruz, Mexico. The course is highlighted by a two and a half week field excursion to Isla de Media and field study by wading, snorkeling and diving on several of the more than 20 coral reefs in the southwestern Gulf of Mexico. Snorkel and SCUBA proficiency are desirable, but not essential.

This course, also offered June 3 through July 3, includes sections for both graduate and undergraduate students. Further information is available from Dr. Tunnel (512/991-6810).

Texas A&I University

Texas A&I University's Department of Biology offers two, three-week summer workshops (BIOL 341 and BIOL 342) June 4 through June 21 and June 22 through July 11, respectively. Participants may enroll in either for four hours credit, or in both for eight; the latter option is advised since the second workshop is a continuation of the first.

The workshops stress aquatic and near-aquatic organisms, both plant and animal, how to study them, their places in the natural scheme, how "people pressures" affect them, how they came to be, and what they are. More than half of each workshop deals with the marine environment. The courses are open-ended;

there are no prerequisites and persons with no biology background can work at their own level while those with biology majors can advance as far as they wish with any of the topics covered.

A number of all day and overnight field trips are included, to the Padre Island National Seashore, Port Aransas jetties and the Welder Wildlife Foundation.

Further information is available from Dr. Allan H. Chaney, Department of Biology, Texas A&I University, Campus Box 158, Kingsville, Tex., 78363, 512/595-3803.

Texas A&M University at Galveston

Texas A&M University at Galveston has two summer sessions, the first from June 4 through July 10, and the second from July 15 through Aug. 16. Graduate-level, marine-related courses offered each session include Problems in Biology, Research in Biology, Problems in Wildlife and Fisheries Sciences and Research in Wildlife and Fisheries Science.

Other courses of interest in Summer Session I include Biology of the Mollusca and Research in Oceanography. Summer Session II includes Biology of Invertebrates, Special Topics in Marine Invertebrate Embryology and Statistical Methods in Ecology.

Further information is available through the Student Records Office, Texas A&M University at Galveston, P.O. Box 1675, Galveston, Tex., 77553.

Year of the Ocean? . . .

(Continued from page 2)

country faces the most horrendous budget deficit in history and that budget cuts as well as tax reform and revenue generation must be high on our list of priorities. But ocean and coastal programs have long been targets for this administration's hatchet team, long before the deficit grew to today's proportions, despite the proven positive cost benefits of many of the programs. And given the role oceans play in the world ecosystem as well as their

real and potential resource value, one would hope a better balance could be struck.

For the Oceanic Society and OCEANS magazine, every year is the year of the ocean! Ideally, with a little help from friends of the oceans, we can see a turnaround on some of the announced budget cuts and the successful passage of a number of widely accepted bills like the Coastal Zone Management Act and the Clean Water Act. Too bad fish can't vote.

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