TEXAS A&M SEA GRANT COLLEGE PROGRAM

Marine Education

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Volunteer now to 'Be a Beach Buddy' September 19 to clean the nation's beaches

Beach cleanup set for Sept. 19

On Saturday, Sept. 19, from 9 a.m. until noon, Texans will have another opportunity to ***Be a Beach Buddy*** and help clean the state's beaches. Coordinated by the Center for Environmental Education, this year's effort coincides with the beginning of Coast Weeks (September 19 - October 3) and will include beaches from Boca Chica near the Mexican border to Beaumont.

In 1986, 2,772 Beach Buddies participated in Texas' first statewide beach cleanup. Because the volunteers completed data cards on the types and amounts of debris they found, CEE was able to identify the sources of the debris, which included beachgoers, the fishing, merchant shipping and petroleum industries, and the U.S. Navy. This data further helped CEE and others formulate and explore solutions to the problem. Since that time, Texas' Land Commissioner Garry Mauro has initiated an Adopt-a-Beach program in which industry groups and private citizens are cleaning specific sections of beach three times a year. CEE, the Texas Sea Grant Program and the Boating Trades Association also are working on a "Stow It–Don't Throw It" campaign for recreational boaters and fishermen.

Even more volunteers are expected this year, according

(See Cleanup, page 2)

Massive stranding cause still a mystery

A record number of dead dolphins have washed ashore on East coast shores this summer, puzzling marine scientists who are still investigating the reason for such an unusual number of deaths.

Between July 6 and mid-August some 125 bottlenose dolphins have stranded on New Jersey, Delaware, Maryland and Virginia shorelines and beaches. In the past, the total has been around 10 animals per year.

Very few of the dolphins are coming ashore alive, says Philadelphia Zoo pathologist Virginia Pierce,who has been assisting in the stranding investigations.

There is a continuing question concerning exactly what is killing the dolphins. Of the dolphins necropsied by veterinary pathologists, several have shown evidence of a "per acute" or a very fast form of pneumonia, including the presence of large amounts of fluid in the lungs and trachea. Yet, other stranded animals show none of the these symptoms. Researchers have taken tissue sections for the microscopy examination and culture study.

"It could be that the ones that are dying immediately from whatever this is are washing up here, and the ones that are strong enough to withstand that first onslaught get the pneumonia and die further south and get washed up down there," Pierce said.

One troubling factor is that marine scientists don't know if this is the middle of a stranding episode or toward the end. "It's hard to say," Pierce said. "Right now, we're still trying to figure out what's going on."

Some of the animals have been dead long enough so it is impossible to say what happened to them. "Some of them have been dead for three or four or five days and they're in bad shape." Interestingly enough, no baby dolphins have been among the dead.

Scientists believe that the 125 animals that have floated to shore are only a fraction of the total dead, many of which probably sank or were eaten by sharks far out at sea.

The bottlenose dolphin is considered one of the most advanced mammals, with a strong immune system. It is usually not affected by sporadic fish

(See Scientists, page 4)

Vol. 8 No. 1 September 1987

Cleanup

(Continued from page 1)

to CEE coordinator Linda Maraniss. "Already 30 hotels have offered beach buddy discounts to encourage Texans to come to the coast for a few hours of work and a weekend of fun," she reports. Those interested in obtaining a list of participating hotels should contact Maraniss at 512/477-6424.

Volunteers will be provided with collection bags, data cards and pencils when they report to their zone captain (see accompanying chart). Maraniss also suggests that all volunteers bring gloves and be dressed appropriately for at least three hours in the sun.

"Last year's beach cleanup was the most documented of any in the nation," Maraniss says, "and it confirmed that trash on our beaches comes from a variety of sources. More than 124 tons of trash was collected along 122 miles of coastline. Nearly 56 percent of it was plastic–including 16,000 plastic bottles, 15,000 plastic bags, 12,000 plastic caps and lids and 10,000 six-pack rings."

Texas is not the only state to wage a beach cleanup campaign on Sept. 19. Thirteen states scheduled similar events last year, and 29 states plus American Samoa, Commonwealth of Northern Marianas, Guam, Puerto Rico and the Virgin Islands have endorsed the Coast Weeks program. The national "Get the Drift and Bag It '87" campaign is coordinated by Judie Neilson, Oregon Department of Fish and Game, Box 59, Portland, Ore. 97207.

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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. Letters to the editor should be sent to Sea Grant College Program, Texas A&M University at Galveston, P.O. Box 1675, Galveston, Texas 77553.

Texas Zone Captains

The following will coordinate the Texas Coastal Cleanup in their communities. Call them if you can help, and you will be told where to report on Sept. 19.

Boca Chica–Del Mar
Joe Ideker
Frontera Audubon Society
512/380-0310

South Padre Island
Teresa Caldwell
Cameron County Parks Department
512/761-5493

Oscar L. Stowe
Gulf Coast Coalition for Public Health
512/542-7701

Padre Island National Seashore
Bob Whistler
Chief Naturalist, Padre Island National Seashore
512/949-8173

Bay City–Sargent Beach and Matagorda Beach
Sandra Schmoker
Bay City Parks and Recreation
409/245-9518

Pat Ratliff
409/244-3840

Brazoria County–Surfside-Bryan Beach
Charles Moss
County Marine Agent
409/849-5711, ext. 1564

Kim McAdams
Director, Brazoria County Parks Department
409/849-5711, ext. 1541

North Padre Island
Don Flint
512/949-8984 (after 5:30)

Corpus Christi–Mustang Island
Ray Allen
Deana Sutherland
Texas State Aquarium
512/851-2595

Port Aransas
Russ Miget
Marine Advisory Service
512/749-5207

Port Lavaca–Magnolia Beach and Matagorda Island
Joe Surovik
County Marine Agent
512/552-9747

Galveston
Lydia Miller
Clean Galveston
409/762-3363

Sibyl Bodamer
Sea-Arama Marineworld
409/744-4502

Houston–Bolivar Peninsula
Maryann Young
713/663-7159

Beaumont–McFaddin Beach
J.J. Jackson
KZZB Radio
409/833-0774

MARPOL amendment progressing in Senate

A major legislative effort is progressing to reduce beach litter on Texas beaches, thanks oddly enough to the Soviet Union. The USSR has now signed an international treaty provision, part of the International Convention for the Prevention of Pollution by Ships, known as the MARPOL treaty for Marine Pollution.

Prior to the Soviet approval, 27 nations representing 41.86 percent of the world's shipping tonnage had ratified the treaty. With the USSR's signature, that number will be about 48 percent. The treaty, passed in 1973 with some changes in 1978, has five clauses, involving pollution issues from oil and hazardous chemical dumping to solid waste disposal at sea. Annex V, concerning the dumping of plastic debris by ships, must be ratified by at least 15 countries that represent at least 50 percent of the world's shipping fleet tonnage.

The United States, with its 4.91 percent of the world's shipping tonnage, could well be the swing vote on approval of the treaty. The U.S. Senate is currently considering ratification of MARPOL 73/78. Kathryn O'Hara, a biologist with the Center for Environmental Education in Washington, D.C., says Annex 5 will come out of committee probably mid- to late-September. "It will marked up and the Senate will take a vote," she said. "It's expected that the Senate will ratify. There hasn't been much opposition from all the industry groups, including the merchant shipping.

"Everybody's been so cooperative. It's amazing. It's one of those things where you can't come out and say,

(See MARPOL, page 7)

Sand analysis brings ocean indoors

by Dr. Marla Stone*

Students can learn much about the origin and age of the particles deposited along the coasts by analyzing beach sand. Sand analysis is also an activity that brings part of the ocean world into the classroom without requiring a field experience. The lab can be used as evaluation for a unit on rocks and minerals, or as a means of increasing awareness and observation skills when looking at sand.

The first step is to acquire sand samples from a variety of beaches, which may not be an easy feat in itself. You need samples in quantities of 100 grams or more, approximately the amount that fills a baby food jar. One method is to request that all students, friends and family (including distant relatives) who are vacationing anywhere near a beach take along a baby food jar and return it full of sand. Each jar (which you should provide) should be labeled with the name and location of the beach sampled.

Sand can be ordered through science suppliers as well. Check the quantity of each sample listed in the catalog, since many are 50 grams or less and this will require a double order.

Once six to 12 samples have been collected, assign one to each lab group for analysis. The activity will take three to five lab periods to complete. With proper instruction and care, most of the 100-gram sample can be returned to its container for use the following year. Do not identify the location from which the sand was acquired this time.

To reduce the amount of paper grading, you might require that every member of a lab group complete a written analysis, but advise the group that only one will be randomly selected for grading and that all group members will receive the same grade.

In addition to the samples, the activity requires a sieve set with at least four sizes of mesh (approximately $25 from most science suppliers), a balance scale (a simple elementary balance with gram masses or a more sophisticated triple beam balance), hand lenses, magnets (wrapped with smooth paper), well slides, 10 percent hydrochloric acid (muriatic acid for swimming pools), and filter papers (or 10cm^2 pieces of typing paper).

*Director, Marine Education Program and Visiting Assistant Professor, Department of Educational Curriculum and Instruction, Texas A&M University.

Marine Facts
for the classroom

The procedure is as follows:

1. Make a paper tray and place it on the scale to hold the sand. Mass out 100 grams of the sand, excluding the mass of the paper.
2. Examine the 100-gram sample and describe its overall color (light or dark, red or tan, etc.), texture (same size or different sized particles), and luster (dull or bright reflection of light).
3. Use the sieve set to separate the sample into parts by size of grains. Arrange the sieve set so the meshes are in sequence with the largest mesh on top and the solid section on the bottom. Pour all the sand into the top section, shaking back and forth and up and down for approximately two minutes. Take the sieve set apart and pour the contents of each section into a separate paper tray. Tap the side of each section to get all the particles, but do not touch the mesh with your fingers.
4. Mass the particles from each section of the sieve set and record them on the chart illustrated here. The total mass should be 100 grams (or very close). Determine what percent of the total is represented by each fraction of the sample. Graph the results.
5. Check each section for magnetic particles by using a magnet wrapped in smooth paper. Gently rub the covered magnet over and through the fraction. Add another section labeled Magnetic Particles to the chart. Place a check mark for each fraction in which magnetic particles are found. Describe the color of the magnetic particles.
6. Use a hand lens (or dissecting scope if available) to examine a small number of the particles in each fraction. List the individual colors that are seen. Note the power of magnification that is used.
7. Still using the hand lens, carefully examine the shapes of the grains. Make a drawing of at least one of each type of grain that is seen in each fraction. The drawings should include enough detail to distinguish them from drawings of other fractions. Classify each type of grain as having edges that are very angular (sharp), somewhat rounded, or very well-rounded (smooth).
8. Identify the types of minerals in as many of the grains as possible. For instance, place a pinch of sand in the well of a well slide and add a drop of dilute hydrochloric acid (HCl). A fizzing reaction may indicate the presence of calcium carbonate (the primary component of shells). Magnetite is a common magnetic material (as found in 5 above) found in igneous rocks.
9. Write a brief paragraph that summarizes the analysis of the sand sample. The following statements may be useful in the analysis.
   A. If most of the fractions contain rounded edges, it may indicate that the sand is old because it takes time to wear off sharp edges.
   B. If most of the fractions contain angular or sharp edges, it may indicate that the sand is young or has recently broken away from its source.
   C. If the graph you made shows that most of the mass is in the larger grain sizes (pebbles or coarse sand), it may indicate that the source of the sand is nearby, since it has not had time to wear down.
   D. If the graph you made shows that most of the mass is in the smaller grain sizes (fine sand to silt), it may indicate that the source of the sand is some distance away and that the sand has traveled a long time.
   E. If the sand contains a number of hard minerals, such as quartz or garnet, and it is well-rounded, it may indicate old age since hard minerals take considerable time to become rounded.

F. If the sand has a number of soft minerals, such as calcium carbonate, and it is angular, it may indicate very new sand because softer minerals wear off quickly.

G. If the sand has magnetic materials mixed with quartz or garnet, it may indicate igneous rock as a source since this rock usually contains magnetite.

H. If the sand contains numerous shell fragments and evidence of microscopic organisms, it may indicate a tropical climate.

I. If the sand has magnetic materials mixed with considerable calcium carbonate or shell particles, it may indicate that the source of the magnetic material may be meteorites rather than igneous rock. Magnetite from land sources usually doesn't collect on tropical beaches.

10. Obtain a second sample from a different location and repeat steps 1 through 9.

Name of fraction	Mass (g)	Percent of total
Pebbles		
Coarse sand		
Fine sand		
Extra fine sand		
Silt		
Total		

11. Write a comparison paper to describe similarities and differences between the two sand samples. Use your data to infer the differences in age and origin of the two beaches.

12. After writing the comparison paper, ask your teacher to identify the collection locations of the sands. Using topographic maps and other oceanographic or geologic data, decide if your inferences are feasible. Can you locate rivers or longshore currents that may be depositing the sand on these beaches? What seems to be the primary source or sources of the sand? How far away are these sources?

References

Boykin, Rosemary E. (1971) **Texas and the Gulf of Mexico**. College Station, Texas: Texas A&M University Press, pp. 1-3 to 1-8.

Staley, Richard M. (March 1978) **Beach Sand Analysis Lab**, presented at National Science Teacher Association, Washington, D.C.

Scientists have no explanation

Continued from page 1)

kills or red tides. The fear is that whatever is killing the dolphins might be deadly enough to affect humans also. Biologists say just about anything is possible, from man-made toxins to a natural epidemic. Years ago, more than 1,000 dying seals beached themselves in New England; studies later revealed that the animals died from an outbreak of influenza.

The appearance of the dolphins began between near Atlantic City and Virginia Beach starting in early July. By July 12, the dolphins started showing up in Chesapeake Bay, and along the Maryland and Virginia shore. Many of the dead sea creatures have shark bites taken out of them. That has caused concern among U.S. Coast Guard officials and local government safety personnel, who believe the stranding pattern increases dangers to recreational swimmers in the area from shark attacks.

Tinnin sets schedule for teacher workshops

Education coordinator Rick Tinnin has announced a schedule of six teacher workshops to be held at The University of Texas Marine Science Institute in Port Aransas through April 1988.

All workshops set for the remainder of 1987 are for secondary teachers. The first, Seaweeds and Seagrasses, will be Oct. 9-11, with Barrier Island Geology and Ecology set Nov. 13-15 and Fish Ecology, Dec. 4-6.

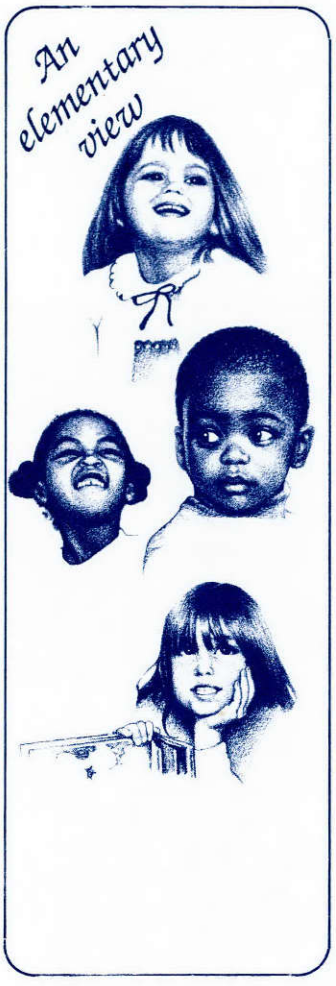
Mr. and Mrs. Fish will head the elementary teachers' workshop Feb. 19-21. This will be followed by a basic marine science workshop March 11-13 for secondary teachers, and a session on Birds of the Texas Coast April 15-17, 1988, for all levels of teachers.

Each workshop is limited to the first 30 paid participants. The registration deadline for each is the Friday preceding the start of the workshop. The $30 workshop fee includes registration, two nights in the dormitory and all meals.

"The Friday session, essentially, is just for check-in and to get acquainted," Tinnin said, "but it is helpful if everyone can arrive at that time. This enables us to get started on time Saturday morning."

Teachers attending any of these workshops will receive Texas Education Agency-approved Advanced Academic Training credit hours at the completion of the weekend.

Specific information is available from Rick Tinnin, Marine Education Services, The University of Texas Marine Science Institute, Port Aransas, Tex. 78373-1267, or by calling (512) 749-6729.



Signal flags at sea

Throughout the ages, sailors have used flags to communicate between ships when they are at sea. Flags are important signals to ships and boats and have been used by naval vessels as well as pirate ships.

Flags are an international system of communication. They can be understood by anyone regardless of the language spoken. They do not need electricity. Flags can substitute for other communications equipment if there is an interruption in the power source.

The international code of flags and pennants uses 26 alphabet flags, 10 numerical pennants, three repeater pennants to indicate repetition of letters or numbers, and an answering pennant. The flags or pennants are flown in vertical order with the first word or message on top. Words or abbreviations can be spelled out. A single alphabet flag flying alone has a standard meaning. Certain paired combinations relay specific messages. Special coded combinations for any number of flags can be used for secret messages.

Classroom Activity

Discuss the advantages and disadvantages of signal flags. Use the international signal flags and pennants worksheet as a reference to make flags and pennants, and exchange messages across the classroom, between classes or between buildings. The color indications for each flag or pennant are given in the key.

Signal Flag Spelling Bee

Have a spelling bee to practice using signal flags. Either have each contestant identify a message you spell out or give each one a message to spell with the flags. Remember that messages are spelled vertically with each flag below the other.

History

Use the school library to find out about the history and importance of signal flags.

Semaphore

Semaphore is a system of visual signaling in which the sender holds a flag in each hand and moves his arms to different positions according to a code alphabet. Semaphores are used between ships or by the railroad. You can make semaphore flags in your school colors and use them during outdoor activities.

Research

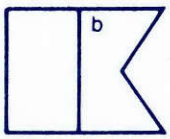
Use the library or talk to knowledgeable individuals to investigate and report on related topics in communications for marine science, such as ship-to-ship, ship-to-shore, ship-to-diver, diver-to-diver signals, navigation lights and markers, use of television, radio, satellite and computer technology, and communication among marine organisms.

*(Adapted from **Investigating the Marine Environment and Its Resources** by Violetta Lien. 1979. College Station: Texas A&M University Sea Grant College Program, 491 pp.)*

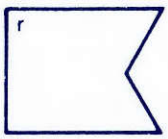
INTERNATIONAL FLAGS AND PENNANTS

Leave white | r Color red | b Color blue | y Color yellow | bk Color black

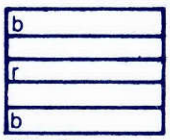
ALPHABET FLAGS



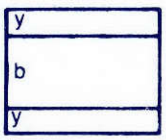
Alfa
Diver down; keep clear



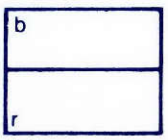
Bravo
Dangerous cargo



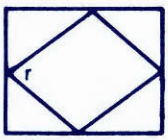
Charlie
Yes



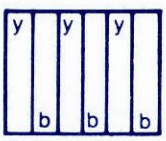
Delta
Keep clear



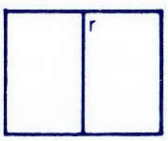
Echo
Altering course to starboard



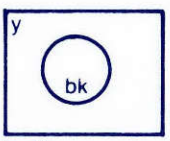
Foxtrot
Disabled



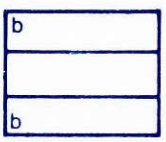
Golf
Want a pilot



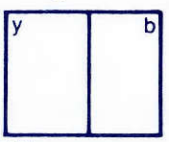
Hotel
Pilot on board



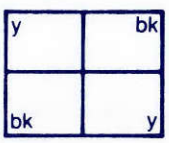
India
Altering course to port



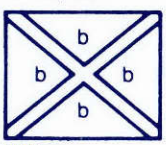
Juliett
On fire, keep clear



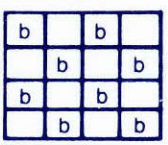
Kilo
Desire to communicate



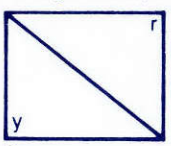
Lima
Stop instantly



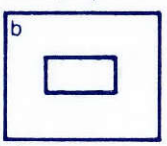
Mike
I am stopped



November
No

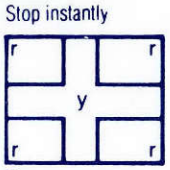


Oscar
Man overboard

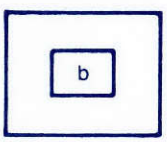


Papa
About to sail

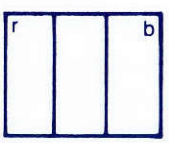
Quebec
Request health clearance



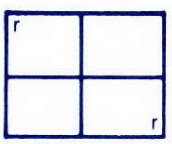
Romeo
(No message)



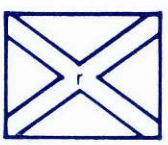
Sierra
Engines going stern



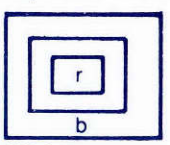
Tango
Keep clear of me



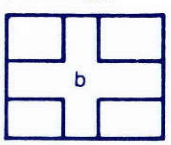
Uniform
Standing into danger



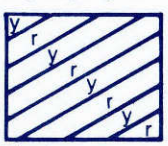
Victor
Require assistance



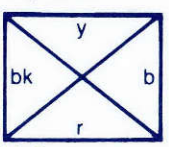
Whiskey
Require medical help



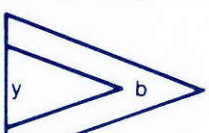
Xray
Do not carry out your plan



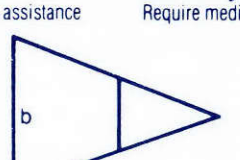
Yankee
Am dragging anchor



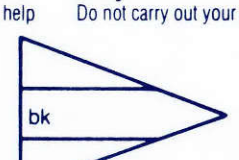
Zulu
Require a tug



1st repeater

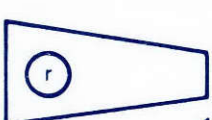


2nd repeater



3rd repeater

NUMERICAL PENNANTS



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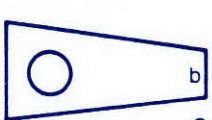

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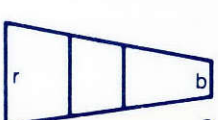

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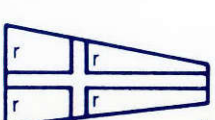

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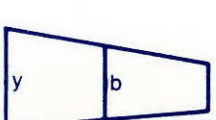

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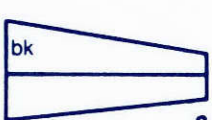

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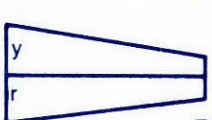

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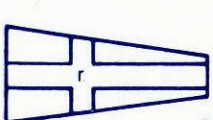

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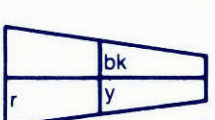

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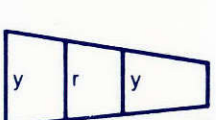

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MARPOL

(continued from page 2)

'No, no, we want to throw our trash in the ocean.'"

The treaty basically does three things:

- prohibits the ocean disposal of all plastics;
- prohibits the disposal of other floating garbage within 25 miles of the nearest coastline.
- designates certain "special areas" where no garbage dumping is allowed.

Presently designated "special areas" are the Mediterranean, Red, Black and Baltic Seas and the Persian/Oman gulfs, all shallow, closed basins with heavy shipping traffic. The Gulf of Mexico, which shares these same characteristics, is not currently designated a "special area."

Enforcement of the treaty in open seas is a problem still being addressed. Those countries that have not signed the MARPOL treaty will still be subject to its regulations if their ships are in waters of a country that has approved MARPOL. Also, a country that has signed is responsible for enforcing the treaty for its ships, even when those ships are not in foreign waters.

Annex 5 would not become effective until 12 months after ratification.

Texas Land Commissioner Garry Mauro has called for prompt U.S. ratification of Annex V, Congressional enactment of enforceable implementation legislation with some type of garbage presentation and off-loading requirement as a precondition for port entry, and support for designation of the Gulf of Mexico as a "special area" under MARPOL 73/78 by the International Maritime Organization.

Seconding the call has been a demand by environmental groups for more stringent and enforceable anti-dumping regulations. The groups are strongly in support of Annex V of the MARPOL treaty, since it would greatly reduce the number of U.S. ships disposing solid wastes at sea and prohibit foreign vessels from dumping in American waters. The annex banning oil pollution took effect in 1983, and another concerning chemicals was ratified only last year.

But Mauro believes that still more regulation is needed. He wants to stop dumping in the Gulf altogether. Under the international treaty, that would require that the Gulf be designated a "special area," like the Mediterranean Sea. As relatively shallow water bodies, those seas are less likely to swallow garbage to their floors than are the oceans. If that happened — and there is no guarantee that it will — only food waste could be dumped overboard, and that 12 miles out at sea. Mauro also wants to set up a ship inspection system at Texas ports and to fine or deny docking rights to ships that do not have all their trash aboard.

Mauro says a problem may arise when Congress decides how to enforce the treaty. Mauro recommends inspecting ships when they dock to see whether they are garbage-free, as they often are now, which indicates that they have dumped at sea. The overboard disposal of trash and garbage by ships at sea is widely believed to be the major source of beach litter.

Any vessel entering a U.S. port from a foreign destination and seeking to dispose of solid waste becomes subject to USDA regulations that require waste to be either incinerated or steam-sterilized and conveyed to a USDA-approved landfill. These regulations are intended to prevent importation of harmful insects or diseases. But few U.S. ports, and only one in Texas, have adequate disposal facilities and most ships dump their garbage offshore. The land commissioner said he learned the Gulf of Mexico was not included in special protection banning all garbage dumping, although the Mediterranean, Black, Red and Baltic seas were. In the meantime, Mauro says he plans to keep Texas beaches litter-free through a campaign for voluntary cleanups.

Sea Grant opens office in Galveston

In an effort to create a more visible presence along the Texas Gulf Coast and to strengthen research ties with Texas A&M University at Galveston, the Texas Sea Grant Program is opening an office in Galveston Sept. 1, 1987. The announcement of the new office was made in late July by Sea Grant Director Dr. Thomas Bright.

The office will be housed at Texas A&M at Galveston's Mitchell Campus. Sea Grant Associate Director Amy Broussard will be permanently located there, and will coordinate all marine education and marine information services for the Program. As a result, ***Marine Education***'s editorial offices will be located in Galveston. The new mailing address is ***Marine Education***, Sea Grant College Program, Texas A&M University at Galveston, P.O. Box 1675, Galveston, Tex. 77553.

Subscriptions or other circulation correspondence should still be forwarded to Texas A&M's College Station campus.

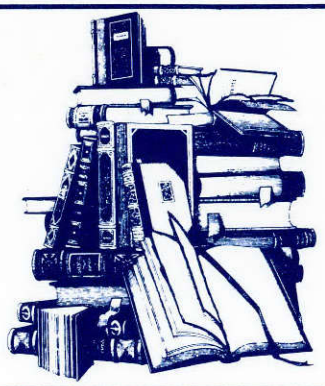
Symposium to coincide with '88 Science Week

Tentative plans are underway for the 1988 Marine Education Symposium, the ninth such event sponsored by the Texas Sea Grant Program. A mid- to late-April date is anticipated, to coincide with the National Science Foundation's National Science and Technology Week. The Symposium will be staged in Galveston in 1988, its first move away from College Station, and will be co-sponsored by Texas A&M University at Galveston.

"Sea Grant's recent decision to open an office in Galveston gives us the opportunity to introduce a number of new speakers and to relate the tours and workshops more closely to the marine environment," says Symposium Coordinator Amy Broussard. "This will result in possibly fewer afternoon activities for larger groups, but participants should leave Galveston with an even better appreciation for marine organisms and the coastal ecosystem."

As in previous years, the Symposium will be a full-day event for students in grades 8 through 12, teachers at all levels, and other interested adults. The program is being designed primarily with students in mind; a decision on receiving approval for AAT credit will be made at a later date.

Registration packets will be available when schools reopen in January and will be sent to all teachers who have accompanied school groups previously. Packets also will be sent to all secondary schools in coastal counties and to Education Service Centers within 100 miles of Galveston. Those interested in further information should contact the Sea Grant Program, Texas A&M University at Galveston, P.O. Box 1675, Galveston, Tex. 77553.

books  & things

September is a good time to examine new books either for classroom or library, and there are a number of new offerings that are worthy of a closer look.

Two free brochures available for the classroom include **Scuba Diving in Louisiana Waters** by Sandy Ruckstuhl and **Vanishing Gulf Coast Wetlands** from the U.S. Fish and Wildlife Service. The former is a 12-page handbook for the beginning diver that answers basic questions about equipment, costs, training, safety and procedures. It is available from Louisiana Sea Grant, Louisiana State University, 202 Center for Wetland Resources, Baton Rouge, La. 70803-7507.

The second is an eight-panel brochure that describes what wetlands are, why they are important to all aspects of life, and what it means to humans, wildlife, housing and protection when the wetlands vanish. Copies are available by contacting the U.S. Fish and Wildlife Service, Richard B. Russell Federal Building, 75 Spring St., S.W., Atlanta, Ga. 30303.

A Nation of Oceans, written by the Center for Environmental Education's Michael Weber and Richard Tinney and illustrated by Mary Beath, is, in the authors' words, a "book for people who want to know more about the oceans" ... who need "no special knowledge of the sea nor of biology." All readers need, according to Weber and Tinney, is "curiosity."

The 95-page paperback describes individual marine ecosystems, such as kelp beds and coral reefs, discusses some basic ecological principles found in operating these and other ecosystems, and gives examples of research conducted in specific marine areas to illustrate how scientists uncover the secrets of life in the oceans. The example ecosystems are part of the National Marine Sanctuary Program, which the authors describe as an important tool for conservation of selected marine areas that is "creating a legacy of the best of the nation's natural marine heritage."

The book is available for $8.95 from the Center for Environmental Education, 624 9th Street N.W., Washington, D.C. 20001.

Doubleday has just released its fall catalog and it includes three books that would be good additions for a school or community library. **Whales, Dolphins, and Porpoises of the World**, written and illustrated by Mary L. Baker, includes a foreword by James G. Mead, curator of marine mammals at the Smithsonian Institution.

The book includes 35 full-color paintings, 107 black-and-white line drawings and more than 50 maps. Each of the 75 species of cetaceans known to naturalists is covered, with descriptions of social organization, breeding and feeding habits, range and migration patterns. The 224-page book is expensive for an individual classroom ($35.00), but makes an excellent library reference acquisition.

A smaller, less expensive book for young readers is **Whales** by Gilda Berger and illustrated by Lisa Bonforte. More than 20 major species are described in a large, easy-to-read format, including the blue whale, the singing humpback whale and the killer whale. The text includes the anatomy and behavior of whales, their relationship to man, how whales are studied by scientists, and the threat of their extinction. An index of key terms is also included for reference.

Whales is available in a 10" x 12" format for $8.95. It is scheduled for a September release to local bookstores.

Also due out in September is **The Physical World** by Tony Seddon and Jill Bailey. This comprehensive reference book encourages young readers to view the physical world in a more scientific way. It explains such things as the making of rivers, oceans and glaciers in simple terms. Special features include trivia quizzes, an index, glossary, and lists of further reading.

Doubleday also has announced a September release for another children's book that – although not related to the marine environment – should be an addition to most libraries. The award-winning Peter Spier has created **We the People, The Story of the U.S. Constitution** to mark the bicentennial of the U.S. Constitution. The 48-page, full-color book retails for $13.95.