

*Instrumented mine photo courtesy M. Richardson, NRL*

VIMS physical oceanographers worked with the Navy to develop a computer model to predict the likelihood of mines becoming buried by sediments. This computer model will help guard the safety of ships in areas that may still have live mines.



Environmental scientists really combine several fields in their work. They study the health of marine organisms & ecosystems. They might use biology, chemistry and geology, for example to understand how human activities affect important marine organisms like blue crabs, oysters or shad. They might have to look for diseases, parasites, or pollutants that affect the Bay, human health and, ultimately, our economy.



Many of the VIMS environmental scientists study local problems here in the Chesapeake Bay like the oyster diseases MSX and dermo. Or, pollutants in the rivers and how they affect marine organisms. But our scientists also study environmental problems in far areas of the globe. Graduate student Heidi Geisz is studying how pollutants such as the pesticide DDT are affecting Adele penguins in Antarctica even though DDT hasn't been used in 30 years. The pesticides were carried down to Antarctica in the atmosphere. They're stored in the glaciers and now that glaciers are melting, they are being released back into the environment.

# MARINE EDUCATION & COMMUNICATION

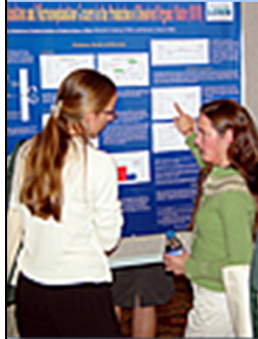
★ Write reports & articles, design web sites



★ Conduct marketing campaigns



★ Offer events



★ Communicate public concerns & needs

About 70% of the US population lives near a coast. So, it is pretty important that the public understands why the ocean is important to them, how it affects them and how they affect the marine environment. And, scientists need to share their findings to the public, ocean businesses and law makers.

Marine communicators and educators develop user-friendly ways to present the information and show its relevance. They may write newspaper articles, newsletters, brochures or posters. They might offer public hearings, lectures, classes, even activities for the whole family. They develop websites, TV or video programs to present information and marketing campaigns to get the public's attention and get them thinking about the ocean. And, they take the public's concerns and needs back to the scientists.

# Variety of Marine Careers

*Eco-tourism Guide*

*Seafood Specialist*

*Environmental Lawyer*

*Film maker*

*Merchant Marine*

*Architect*

*Computer Technologist*

*Fisherman*

*Marines, Navy, Coast Guard*

*Diver*

*Marine Mechanic*

*Boat/Ship Captain*

And, there are even more marine-related careers that we don't have time to talk about today. All kinds of careers are crucial to the support of ocean science, ocean awareness, industry and economy. Many require college or technical preparation. But, some draw on other skills: boat mechanics and pilots, fishermen, seafood chefs, even film makers contribute to our understanding of the ocean and are important in helping to keep it healthy and productive.



Dr. Mark Patterson invented the underwater robot “Fetch” to help him study marine life. Fetch can dive down to 1,000 feet and stay underwater for 4 hours. It can take water quality measurements, video and sonar images.





A VIMS graduate student in biological oceanography combined her love of biology and her love of art and designed ocean-themed stuffed organisms for Giantmicrobes Inc. She designed the algae, sea sparkle, krill, red tide, and pond scum.



Several VIMS graduate students have gone on to become full-time high school science teachers after finishing their master or PhD degrees.



## Sound interesting? How to prepare? 2 pathways...

### Vocational/Trades Prep

- shop, mechanics, drafting, marine trades
- English, communications/speech,
- math & computer science

### College Prep

- biology, chemistry, physics, earth science,
- English, communications/speech
- advanced math, computer science, engineering

### In College

- broad science background -- specialize later!
- English, math, computer science
- research opportunities for undergraduates

So, if this sounds interesting to you, what can you do now to prepare yourself or to find out more about it:

Getting a good basic foundation in science, math, communication skills will pay off no matter what career you pursue:

In Middle school: science, math, language arts

In High school: There are 2 tracks.

Most oceanographers take college prep, all sciences, math, communications, 2<sup>nd</sup> language

But oceanography depends on marine trades, so you may be interested in that kind of marine career: shop, mechanics, marine trades (piloting, etc)

In College: choose a school with a good reputation in science education, get a broad background, specialize later. Look for institutions that offer research/field experiences for undergrads.

## Learn more about it:



◆ **Museums, aquariums & science centers**

◆ **Universities & research centers**

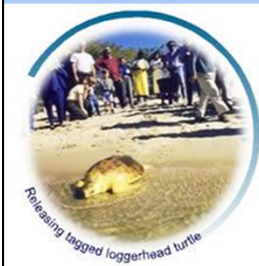
◆ **Science books & magazines**



◆ **Surf the web: virtual marine expeditions**



◆ **Scouts, Coast Guard Jr. Auxiliary & environmental projects**



If you're not sure yet... You can learn more about marine careers in lots of ways and meet people that are doing them:

\*Attend a marine-related course or field program at a museum, aquarium, science center.

\*Local universities and research institutes offer public programs at universities & research centers, e.g. lectures, workshops, open-houses. VIMS has several activities each year. Tour VIMS at Marine Science Day, May 20, 2006.

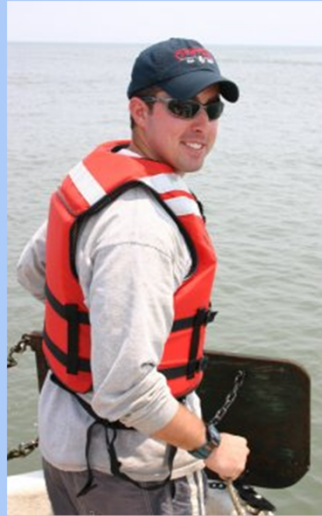
\*Read: popular science magazines and books, scientists biographies, expedition logs & histories

\*Web sites: virtual expeditions and other websites by science centers, Federal agencies, museums and universities show you up-to-date marine science activities, some even have ways to communicate with the researchers while they are on the expedition.

\*Sea Scouts (co-ed program of Boy Scouts), Coast Guard Auxiliary provide some training opportunities. Get involved in environmental/community service projects (clean the beach, restore the marsh).

(If they ask about \*Career-related volunteering, internships & employment – There are limited opportunities, but worth looking for. Will have to wait until high school. In VA, Governor's Schools offer summer mentorships; some aquariums and museums have junior volunteer programs, some high schools and colleges offer service learning (credit in return for service to the community).

Someday, you may want to be part of this TEAM



So, now you have an idea of what it might be like to be a marine scientist. Your teacher has more materials and we left a list of websites you can visit to learn more.

We hope to see you and your families at VIMS Marine Science Day, when you can tour a marine science institute and try your hand at other research activities.