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LETTERS

dents are "clients" and colleagues at other institutions potential "customers," and the kind of generosity shown by the authors of free research tools is more the exception than the rule—research administrators usually come down heavily on anyone who dares to give away anything for free.

I encourage us all not to give in to ideological positions that can only stifle scientific research, and to continue to share ideas, tools, and results not for financial return but for the satisfaction of receiving credit in the work of others. I congratulate the Oceanography Society for its support of this attitude and its service to the research community. With this note I want to suggest that the Society introduce a similar service for the oceanographic teaching community by promoting free teaching services.

Scientific and classroom texts are notoriously expensive. Paying high prices for textbooks is a significant burden for students, with a standard demand on the lecturer to supply students with free or inexpensive lecture notes. I am sure that a pool of lecture material exists that could be tapped to help the lecturer and benefit the students. Properly managed, access to this pool through the internet could become a reality.

Use of the web for classroom teaching has not developed at the same pace as its use in the exchange of research data and results. Nevertheless, the web is beginning to show its impact on teaching. Lecturers use the net to post notices, make teaching material available, and set assignments. Their reasons for doing this are many. It may be the fascination with a new medium, the ease of management, or simply a response to growing administrative pressure. The result is a growing availability of educational material in electronic form that in theory could be shared among colleagues to make life more manageable for the overloaded lecturer.

The problem is that finding the right material on the net is not easy. There are of course search engines, and their search success rates are getting better by the day. There are dedicated listings, too, such as the World Lecture Hall (<http://www.utexas.edu/world/lecture/index.html>), which gives access to lecture notes of cooperative colleagues. But when you start digging, most "lecture notes" turn out to be not much more than a brief course syllabus with a reading list, which is far from the full set of notes you had hoped for. In the end, you are still left without much help for the preparation of a new course.

There are useful exceptions. Peter L. Guth at the Department of Oceanography of the Naval Academy in Annapolis maintains some very nice PC-based teaching modules for marine geophysics and physical oceanography on his home page (<ftp://ftp.nadn.navy.mil/pub/oceano/website/plghome.htm>): I have been using his module on ocean tides with great success in my classes. An online course on remote sensing is

under development at the University of Maryland; the first teaching modules can already be accessed (<http://research.umbc.edu/~tbenjal/index.html>)—unfortunately they have little relevance to oceanography, but this may change as the course develops). Among my own contributions to online course material are the lecture notes to my introductory (first year undergraduate) course on Physical Oceanography (<http://gaea.es.flinders.edu.au/~mattom/ES1/contents.html>); other material can be traced through my home page <http://gaea.es.flinders.edu.au/~mattom/mattom.html>). Lecturers at universities in Australia, Europe, and the United States have let me know that they find the material useful for their own courses.

It may be worth mentioning that my reasons for making lecture notes accessible on the net were purely administrative. To meet the students' expectation for printed lecture notes, the School of Earth Sciences at Flinders University had been selling such notes for a number of years, asking the students to pay a few dollars to cover costs. When the government instructed universities that this practice was illegal (the argument being that the students had paid their annual fees and therefore could expect free course material), the School was left to foot the bill. Placing the lecture notes on the net was an obvious way out because net access through computer terminals is free, and having my lecture notes on the net thus complies with the law.

Using the net for lecture notes has other advantages. It is much easier for the lecturer to update material in the middle of a semester. It allows the use of color at no extra cost and thus the inclusion of much better illustrations. Most importantly, it forces students to learn such old-fashioned skills as individual note taking. Looking at material on the screen and following cross-links inevitably requires note taking for later study and trains the student to discriminate between the important and the decorative.

It appears to me that The Oceanography Society would offer invaluable assistance to its teaching members if it could set up an information base on existing course material in oceanography. Such a service would give university teachers access to the full text and illustrations for a course and would allow them to download computer laboratories for local execution. The service could take the form of an entry on the society's web page with brief descriptions and links to the electronic course material. The Society might consider setting up a group responsible for maintaining the service, whose task would be to decide which material should go into the list of links. This activity might even grow into a new branch of the society's publications: The Society could require peer review before teaching material is accepted for listing on the society's page. Listed material would then attain the status of a publication. This would give colleagues who are prepared

THE OCEANOGRAPHER'S TOOLKIT—THE WEB AS A TEACHING TOOL

Since its inception a few years ago, the Oceanographer's Toolkit has been promoting research tools such as OceanAtlas, Atlast, BILKO, and EPIC and continues to be a valuable service to the oceanographic research community.

The applications and uses of the different research tools vary. What they have in common is the attitude of their authors to share the products of their efforts freely with colleagues. Ten years ago this would not have been remarkable. But times have changed. In today's world, university courses are "marketed," stu-

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to freely share their teaching notes some recognition. I would be among the first to make frequent use of such a service.

Certain technicalities would of course have to be sorted out. If The Oceanography Society is to put its "stamp of approval" on electronic material, there has to be some guarantee that the material is protected from unauthorized alterations. This rules out a simple link from the Society's web page to authors' pages. The Society's electronic teaching library will have to reside on a server where the library is controlled by the Society. Links to authors' web pages could be part of the system but should carry a qualifier that they give access to the

most recent version of the material that has not yet been reviewed.

There is another aspect to this issue. In my career as a university teacher, I have trained oceanographers from all continents. Most of my Asian, South American, and African graduates have lecturing positions in their home countries, where internet access is slow, cumbersome, and expensive. All of them have access to fast personal computers with CD-ROM drives. Anyone who has a CD-ROM drive with writing capability knows that copying a set of electronic notes to a CD-ROM is as simple as placing the set on the net. For those of us who have a net

browser on the PC but cannot afford the cost of internet access, having the same material on a CD-ROM makes all the difference between only knowing of the material and being able to use it.

If The Oceanography decides to set up an electronic teaching library, the next logical step would be to publish some or all of the library material on CD-ROM and offer it at a price affordable for institutions in the developing world. This would be another step in the direction of one of the Society's declared goals, to serve the oceanographic community globally and become a truly international society. □