

Pondering the fate of copyright

Grabbing an image, downloading a music track from a new compact disk, or sending a copy of a news article to a friend is a cinch on the Internet. Such easy sharing of digital information, however, poses difficult problems, says computer scientist Randall Davis of the Massachusetts Institute of Technology. It calls into question traditional forms of intellectual-property protection, such as copyright, which have long served as tools for maintaining a delicate balance between the need for public access to information and the interests of the creators of that information.

In a new report, a panel of the Washington, D.C.-based National Research Council (NRC), chaired by Davis, foresees major changes in the handling of intellectual property. It also emphasizes that innovative technology and novel business practices, applied in conjunction with existing copyright laws, are likely to be far more effective in protecting electronic information than sweeping legislation would be. The panel's draft report, "The Digital Dilemma: Intellectual Property in the Information Age," is available at <http://www.nap.edu/books/0309064996/html/>.

The dilemma arises because easy copying—illicit as well as legal—stems from the same technology that permits people to have unlimited access to information. "The tradition of providing for a limited degree of access to published materials that was established in the world of physical artifacts must be continued in the digital context," the NRC panel concludes. However, because electronic media and computer networks blur the distinction between publication and private distribution, the panel recommends that the concept of publication itself be reevaluated.

One trend the panel emphasized is an increase in the licensing of digital information, especially software. However, such access management makes information "more an event to be experienced, rather than an artifact to be kept," Davis observes. Online journal subscriptions are actually licensing arrangements. "When you buy a subscription to a traditional journal, you own the back issues when the subscription expires. With an online journal, what do you own when the subscription expires?" Davis asks.

The panel's report also touches on such issues as archiving and preservation, protecting material cryptographically, allowing fair use, and maintaining access to government information. —I.P.

Scenarios for a Y2K new year

Despite Hollywood's appetite for impending disaster, no one can predict what will happen on or after Jan. 1, 2000, when people around the world have to cope with the consequences of the Y2K computer problem. Any system still using two digits instead of four to represent the year in software or electronic chips could fail, with potentially catastrophic repercussions in some cases (SN: 1/2/99, p. 4). "Y2K is going to teach us interesting things, no matter what actually happens," says Thomas P.M. Barnett of the U.S. Naval War College in Newport, R.I.

Barnett and his colleagues have produced a lengthy report systematically detailing a wide range of possible scenarios, from relatively benign to dire, of what Y2K might look and feel like in different parts of the world and different sectors of the economy. The latest draft of their report appears at <http://www.nwc.navy.mil/y2k/y2krep.html>.

The researchers divide their scenarios into several phases. Along one projected timeline, individuals, businesses, and governments initially stockpile goods in proportion to their fears of interrupted services. That phase gives way to a countdown, when people top off their supplies and choose where they will celebrate or ride out the date change. What happens next—through the onset, unfolding, peak, and exit phases of Y2K problems—depends on whether the New Year's Day software bug proves a dud or a globally stressful event. —I.P.

Plumbing Antarctica for climate clues

Climate scientists have been struggling for years to figure out whether global warming will awaken a sleeping southern giant: the vast glacial blanket covering the western portion of Antarctica. A trio of new studies in the Oct. 8 SCIENCE provides clues to how much of a threat this ice poses.

Unlike the more stable ice in East Antarctica, the West Antarctic Ice Sheet (WAIS) has melted and regrown in recent geologic times, raising the possibility that global warming could cause it to break up. This disaster would flood many coastal cities around the world.

In one new study, Howard B. Conway of the University of Washington in Seattle and his colleagues report on one piece of West Antarctica, the floating apron of ice covering part of the Ross Sea. During the peak of the last ice age 18,000 years ago, that entire ice layer reached all the way to the seafloor. Since then, the line where ice meets seafloor has retreated southward, by more than 1,000 kilometers in places.

By dating the positions of this so-called grounding line, Conway's group demonstrated that the retreat has been steady since the beginning of the warm period 10,000 years ago known as an interglacial episode. Any recent human-caused warming of the climate is simply adding to a process triggered by the end of the last ice age. "Continued recession and perhaps even complete disintegration of the WAIS within the present interglacial period could well be inevitable," concludes Conway's team.

Another group, led by Ian Joughin of the Jet Propulsion Laboratory in Pasadena, Calif., used satellite data to study rivers of ice flowing toward the Ross Sea. These broad currents, called ice streams, course at speeds hundreds of times faster than the movement of surrounding ice. Researchers are concerned about these currents because they would play a pivotal role if the West Antarctic ice sheet started to collapse.

Joughin and his colleagues analyzed data collected during a 30-day period in 1997, when a Canadian radar satellite was pointing south instead of in its normal northerly orientation. By comparing images taken weeks apart, the researchers mapped the speed of the Antarctic ice. They discovered tributaries extending hundreds of kilometers upstream of the ice streams. The researchers were surprised to find some tributaries feeding two different ice streams, says Joughin.

"What they've demonstrated is that with appropriate satellites, they can tell us what is going on. We're going to learn so much. It's phenomenal," says Richard B. Alley, a glaciologist at Pennsylvania State University in State College.

A third study showed that during the end of the last ice age, the thickness of the inner part of the West Antarctic ice sheet didn't change as much as previously thought. —R.M.

Storm damage soars in La Niña years

When the equatorial Pacific Ocean turns cold, as it did this year, residents of the Gulf Coast and eastern states should gird themselves for some particularly bad storms.

Scientists had recognized that La Niña cooling in the Pacific aids the growth of tropical Atlantic storms, but they had not documented the costs. Tallying such numbers required adjusting damage figures for inflation and changes in coastal development. Roger A. Pielke Jr. of the National Center for Atmospheric Research in Boulder, Colo., and Christopher N. Landsea of the National Oceanic and Atmospheric Administration in Miami compared the adjusted damage totals for all storms since 1925.

The United States faces higher odds of getting hit by more storms packing more energy during La Niña years, conclude the scientists in the October BULLETIN OF THE AMERICAN METEOROLOGICAL SOCIETY. Officials can use this pattern to plan for storm damage, they suggest. They note, however, that catastrophic storms can hit in any year. —R.M.