Colonizing the Internet: The environmental move on-line

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Colonizing The Internet: The Environmental Move On-line

by

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Many environmental organizations today are taking advantage of the benefits to be had in going on-line. They use computer-mediated communications (CMC) to gather and disseminate information cheaply and effectively. Other groups are still having difficulty using this technology. In order to gain more insight into this, I interviewed six local environmental groups in Missoula, Montana. The results indicate that, at least for this small group, cost is not as important a factor as a perceived lack of time to learn this new communications tool.

There are many reasons why an environmental organization might want to go online. Practically speaking, the cheap, fast communications possible are the primary benefit. All the organization interviewed used e-mail more than any other service. There are also examples of organizations using the Internet in more advanced ways, such as distributing information on Gopher servers and on the World Wide Web. Many environmental organizations use EcoNet as their service provider.

The future of the Internet, in terms of its democratic potential, is being decided now. Policy makers have launched attacks on the democratic culture of the Internet as it exists now. It is in the best interests of environmental organizations to prevent these attacks from succeeding. Colonizing the Internet, and thus developing a vested interest in its future, is the first step in this process.
Acknowledgments

I would like to thank, first and foremost, my parents, without whom none of this would be possible (including me!). My father sacrifices so much for his children’s happiness, and my mother holds everyone together no matter how many miles may separate us. I’m luckier than most to have such a close-knit, loving family, and they’ve been very supportive of my efforts in graduate school—I didn’t want to disappoint anyone.

I would also like to thank my committee for their fine editing skills, and for their uncanny ability to tell me just what I seem to need to know at any given moment. In particular, I’d like to thank Bruce Jennings for his relentless drive for me to “pull it all together,” Vicki Watson for her role as the uninitiated user, and Barry Brown for his valuable technical suggestions and cyber-hints.

For taking the time out to participate in the survey I conducted, I’d like to thank the following organizations: Alliance for the Wild Rockies, Clark Fork Coalition, Ecology Center, Wilderness Watch, Wild Forever, and Women’s Voices for the Earth. I think Missoula must have the distinction of having the largest number of environmental organizations per capita.
Introduction

“May you live in interesting times.”—Ancient Chinese Curse

It was while I was attending Xaverian High School in Brooklyn, New York that I first was introduced to the idea of computer-mediated communication (CMC). That was back in 1983, when the hottest new item a young computer enthusiast could own was an Atari or Commodore-64 computer and a modem. I can still remember my first computer: a clunky Atari 400, with a spill-proof membrane keyboard, and a whopping 48 kilobytes of memory. That was the present I received upon graduating high school, and at first I was happy playing Pac Man and programming in BASIC, but that phase did not last long.

Most of my friends in those days also had computers; we were extraordinary nerds and we knew it. One such friend was the system operator (sysop) of a BBS called Paranoia. I had never heard of a BBS before and my friend explained that it was an acronym for Bulletin Board System, an electronic system of posting messages to many people all at once and then reading the collective replies (like a cork-and-pin bulletin board). This sounded very interesting to me, and after talking a bit more to my friend, the sysop, it wasn’t long before I purchased my first modem. In those days a speed of 300 baud for a modem was still an option. And 1200 baud? Now that was state-of-the-art.

In no time at all, I was feeling right at home on Paranoia. It wasn’t a very complex system back then; the sysop had programmed it himself using BASIC. As simple as it was, however, it was enough to hold my interest. Paranoia BBS was
broken down into separate "boards," places where people interested in the same
general topic could gather to post messages to each other. Users of the system could
also send private messages (electronic mail) to each other. Through all of this, no user
ever met any other user face to face, except at the yearly Paranoia User Meeting.

This was such a fascinating process for me that a few years after being
introduced to Paranoia, I programmed my own BBS called Crashelot. Breathing life
into such an ephemeral electronic world was even more interesting than simply
participating in it. Paranoia, meanwhile, had progressed to offering the ability to send
and receive files amongst users, and it was even part of a computer network called
FidoNet which linked small BBS's all over the world to each other.

This electronic world was a community for me. After a short while, I was able
to distinguish different users' personalities, and I developed friendships without ever
meeting some of those people face-to-face. Since I was so well acquainted with the
technology that was making this all happen, I took it all for granted. I was jaded to the
phenomenon of instantaneous electronic communication and data retrieval, and so the
implications of this technology were not very obvious. Commercial electronic
communication had just appeared on the scene, but were slow to grow.

I now consider those days to be the pioneer days of CMC, and I suppose I'm a
bit nostalgic. Everything was new and the possibilities were endless. It was around the
time I started Crashelot, however, that I became aware of a much larger electronic
entity on the horizon, the Internet. That was in 1986, just before the Internet started to
grow exponentially, and it was still very new to most people. The government and
corporations didn’t pay much attention to this interesting technological development at the time.

When I first started using the Internet, it was solely for enjoyment, sending messages to people all over the world and finding all sorts of interesting information. Even back then it was possible to get some useful activist-oriented information from the Internet, usually in the form of news groups. There were other uses too—I can still remember sending electronic mail (e-mail) to a randomly chosen Unisys employee, telling him about his employer’s economic involvement in South Africa.

CMC is a powerful tool, as major corporations know, having long had their own internal world-wide networks with which to communicate with each other. The Internet, however, allows small businesses and non-profits to have the same ability for low costs. And low-cost global communication is just one benefit, another being access to data. There is a great amount of data on the Internet that can be extremely helpful to progressive organizations—not very surprising considering that much of this information is being generated by like-minded non-profits.

Obviously, it would seem that the Internet holds many possibilities for progressive movements. Environmental organizations, in particular, can benefit greatly from CMC and the Internet. Already many environmental organizations use e-mail every day to communicate with others in the movement, sharing ideas and formulating strategies. Useful databases and news sources exist to make CMC a very useful tool for the environmental movement. The Environmental Protection Agency (EPA), for example, offers many on-line databases that are accessible to the public.
In Fiji, from 1992-93, I worked for a very small environmental organization, the South Pacific Action Committee for Human Ecology and Environment (SPACHEE). SPACHEE’s office is located in Suva, Fiji’s capital, on the campus of the University of the South Pacific (USP). SPACHEE worked mainly in the areas of education and public awareness, but it also acted to represent South Pacific interests in the international arena. While I was there, USP managed to establish a connection to the Internet, and I made sure that SPACHEE received an account (spachee@usp.ac.fj). Now SPACHEE, a small non-governmental organization (NGO) in the South Pacific, has the ability to communicate with other NGO’s, private organizations, and donor agencies all over the globe for much less than the cost of a fax (in most circumstances, there’s essentially no cost at all).

As beneficial as this technology can be, however, it must be made as accessible as possible—otherwise, our society will suffer from creating a society of information haves and have-nots. Unfortunately, there’s already a have and have-not situation forming around access to the Internet, and although there are some people working on this, more needs to be done. This issue also bears directly on the movement of environmental organizations on-line. It is not enough to ensure participation by mainstream environmental groups, for doing so only perpetuates the have and have-not mentality of access to the Internet in general. To be a genuine representation of the environmental movement, grassroots groups must participate as well. For reasons I’ll discuss later, there is a limit to how quickly this can occur, but it must be a goal that is pursued steadfastly.
Most people agree that television’s democratic potential has been largely eliminated due to its commercialization, and it is important to ensure that the same thing does not happen to the Internet—it is simply too good an opportunity to let pass. Because the government and large corporate interests were slow to realize the potential of the Internet, a unique opportunity has presented itself. Namely, the opportunity for progressive forces in our society to use the Internet for their own purposes. Unfortunately, however, the Internet is now in danger of being exploited solely for profit, letting more noble aspirations fall by the wayside.

Cyberpunk fiction, a genre related to science fiction, offers us a glimpse of a possible future where corporations largely supplant world governments and typically control every aspect of a citizen’s life. In these novels, “Cyberspace” refers to a worldwide computer network similar to the Internet, except that it is ruthlessly controlled by large corporations or “megacorps.” It should be obvious, though, that reality is converging, at least in some respects, to the cyberpunk vision. The Federal Bureau of Investigation (FBI) and the National Security Agency (NSA) are busy trying to stifle private communications on the Internet by placing restrictions on the use of cryptography and proposing legislation to make electronic snooping easier. Large corporations have taken an interest in turning the Internet into a commercial venture, replete with electronic shopping malls.

These examples highlight the threats that exist to the democratic, grassroots use of the Internet. In fact, these examples threaten the freedom and privacy of all American people. In the following sections I will introduce the reader to the Internet,
outline its history, and compare it to other mediums. With this as the background, I
will then discuss its use by the environmental movement, some of the obstacles here,
and why it is so crucial that this happen. Finally, I will discuss what the future may
hold for the Internet if steps aren't taken now to address these issues.

We are at a crossroads. The Internet can be used for either great social progress
or great social domination, and we do have a say in which direction it goes. But it
won't be easy. There are other forces working to turn computer networking
technology against civil society. The first thing to do is to become informed about
what's at stake, and what is being done to attack this medium and to defend it. We live
in exciting times, and if we play our cards right then cyberpunk fiction might turn out
to be just that, fiction.
Computer-Mediated Communication and The Internet

"If a Nation expects to be ignorant and free in a state of civilization, it expects what never was and never will be... If we are to guard against ignorance and remain free, it is the responsibility of every American to be informed."—Thomas Jefferson, letter to Colonel Charles Yancey, January 6, 1816

CMC

Computer-Mediated Communication (CMC) relies on the transmitting of information between people through the use of computers. To say that CMC has grown rapidly since its inception would surely be an understatement, since it is rapidly becoming a standard means by which organizations communicate with each other. Computer networks, in particular, have played a big part in this increase in popularity since networking allows more people to interact electronically with each other.

At first CMC was used mainly by large corporations and consisted of their internal computer networks. These networks existed primarily to share resources, but were quickly used for interoffice communication as well. They soon expanded to cover buildings, office blocks, and, for the largest companies, the entire world. For a multinational corporation, the ability to communicate quickly and cheaply around the globe is of paramount importance, and so computer networks played a key role in their growth.

In addition to these large, expensive systems, however, there existed small, very local attempts to communicate electronically via computers. Bulletin Board Systems (BBS’s) could be created with simply a computer, a modem, and the right software. BBS’s started to become popular in the late 70’s and really took off in the 80’s. One person can create a BBS on their on home computer and then other people can use their
computers and modems to call in and leave public or private messages to other users of the system. Public messages are divided into subject areas so that users need only read the messages that interest them. Most BBS's are free-of-charge, but there are also many large BBS's that charge for their services. BBS's have grown rapidly in sophistication and popularity, and are now used by individuals, private organizations, and government agencies to disseminate information and communicate with each other.

The introduction of FidoNet in 1983, a network design that lets BBS's worldwide share messages with each other, made BBS's into a small decentralized version of the large corporate networks. Each BBS that is part of FidoNet sends some or all of its messages to another FidoNet BBS that sends the messages to all other FidoNet BBS's. Each BBS in the network can choose which message subject areas it will transfer in this way and also which ones it will accept from other BBS's. In this way a user on one FidoNet BBS can potentially have access to messages generated on another FidoNet BBS that is in another part of the world. FidoNet continues to be popular because it is not very complicated, and it is very inexpensive. For those on a shoe-string budget, and not that much time to spare, FidoNet is a good way to become part of an effective communications network.

At around the time that BBS's were getting extremely popular, commercial online services started to appear. The largest such service, CompuServe Information Service, started in 1969 as a time-sharing company, but did not offer its public services until around 1980. There are many others, such as America Online, Prodigy, Genie, and The Well. Of all the commercial services, though, the one most interesting for
environmental activists is EcoNet. This service is dedicated to bringing CMC to environmental organizations and to individuals with an environmental interest. EcoNet began in 1987, and like the rest of the on-line services, it has grown tremendously.

The Internet

Today, the largest and most interesting example of CMC is the Internet. In fact, it is the closest thing to the so-called “information superhighway.” It covers the entire world, with over two million computers connected to it in the US alone. The Internet is growing fast, too—the number of people using it is growing all the time. There is no central authority for the organization of the Internet, and anyone can join and contribute to it no matter where they are. These features make the Internet perhaps the most promising decentralizing technology of all.

The Internet did not simply spring into existence overnight, but instead grew slowly into the enormous entity it is today. The Internet gets its name from being a computer network of computer networks. It all started with one network which was later joined by other networks that all communicate with each other. A person connected to any network on the Internet (e.g., a college campus) can theoretically access information anywhere on the Internet (e.g., the Environmental Protection Agency).

Ironically, the Internet started as a military project. Specifically, in 1969, the Department of Defense formed ARPANET, a network for the Advanced Research Projects Agency (now the Defense Research Projects Agency). This network was used by government scientists to communicate with each other and share information. In
1983, ARPANET split into ARPANET and MILNET, the Military Network, and soon other networks were linked to these. These first inter-connected networks were the beginning of the Internet.

The NSFNET, created by the National Science Foundation (NSF), joined the Internet in 1986 in order to link national super-computer centers together. Because of its obsolete technology, ARPANET was retired from service in 1989, and the NSFNET became the main backbone network of the Internet. By 1991, however, the Internet was so large that the NSFNET backbone was nearing its limit. In response to this situation, IBM, MERIT, and MCI formed a nonprofit company called Advanced Networks and Services (ANS) which, during 1992, built a new backbone network to replace NSFNET. This network is called ANSNET and has thirty times the capacity of the NSFNET.

The formation of ANSNET marked the first time that federal funding did not play a significant role in the backbone of Internet. Instead, a private company assumed that role. Today there are other commercial national backbone networks in the US, including PSINet and AlterNet, which are both privately owned and maintained. These commercial parts of the Internet are not subject to the limitations on commercial activity originally imposed by the NSFNET.

Although the Internet was started by the US Department of Defense, the Internet is now much larger than it was originally intended. Only a small portion of the Internet is funded by the federal government through the NSF. Many countries outside the US have their own Internet backbone networks, making the Internet a truly

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world-wide network of networks. The Internet grew faster than anyone could have predicted at its inception, which is there weren't any plans for the possible uses of this medium. Given the popularity of the Internet today, however, this situation is changing.

The Internet is growing larger every day with more people directly connecting to the it or gaining some other form of access to the Internet through other sources. Many private Internet providers have come into existence to take advantage of this increased interest in the Internet and help provide Internet service to those who need it. There has also been an increase in the number of organizations that help non-profits get connected to the Internet, some even specializing in environmental groups. The rapid increase in the size of the Internet can best be characterized as being exponential with a rapid doubling rate (Figure 1). These numbers, however, are just the number of computers connected to the Internet—the number of users is much higher since each computer can have many users.

![Figure 1: Number of Computers Connected to the Internet](image-url)
Using the Internet

Most computer networks have the capability to send and receive electronic mail (e-mail) amongst its users, and the Internet is no exception. E-mail is one of the most useful features of the Internet and is, in fact, the most common service used by those connected to the Internet. E-mail is an extremely fast way to communicate and has the advantage of being timing-independent. The recipient of a hypothetical piece of e-mail can read the message whenever they have a chance to check their e-mail which eliminates "phone tag." E-mail combines the speed of a telephone call with the timing-independence of postal mail. A fax machine can provide the same combination, however a fax machine also needs paper and does not provide the ability to save, edit, copy, and forward messages as does e-mail. With the advent of fax-modems, this might change, but currently using a fax-modem still requires complicated optical character recognition (OCR) software and for the computer to be on when a fax is being received. Innovative techniques have been implemented to deal with these problems at the grassroots level, although such efforts are still in their early stages.

E-mail is also useful for the creation of mailing lists. A typical mailing list would consist of a list of users that would like to share e-mail with each other. Whenever one of the users sends e-mail to the list a copy of the message is sent to each member of the list. Mailing lists make it possible for a group of people interested in a common topic to share ideas with each other in a very open environment. This is also a great way to distribute action alerts as fast as possible.
The primary disadvantage with this type of communication, of course, is that it only works if the recipient bothers to check their e-mail on a regular basis—many people who have access to e-mail don’t do this. Sometimes this is because it is too expensive to check e-mail more often. Other times, someone might not feel they have enough time. This is especially true if the person isn’t very effective in using the technology. Even if a person wants to check their e-mail, however, they still have to be able to get to their e-mail to read it. This can be a problem when dial-up accounts are continuously busy, another factor contributing to people’s frustration. Another possible difficulty with e-mail is the way in which it can accumulate precipitously in your electronic mailbox. It’s easy to get into a situation where you couldn’t possibly read all the e-mail you get in a single day, but it can usually be avoided by not subscribing to too many mailing lists.

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Figure 2: Sample Internet newsgroups

In addition to e-mail, there are also newsgroups on the Internet, collectively referred to as network news, or netnews for short. Newsgroups are basically like those BBS “boards” I mentioned in the introduction—they are places where people post.
public messages on a particular topic. The growth of these newsgroups is truly amazing. According to The Internet Book, by Douglas Comer, by early 1994 there were over 6000 newsgroups divided into over 171 categories. The range of topics represented on these newsgroups is extremely wide. Figure 2 demonstrates this by listing some of the newsgroups that see the most activity at my site (selway.umt.edu).

The total traffic on netnews, meaning the size of all the new articles posted to newsgroups each day, is about twenty million characters (Comer, 1995). If a typical post is about two thousand characters, this translates into ten thousand new articles every day. No one can possibly read that many messages, so it’s necessary to be highly selective in the newsgroups you follow regularly. Fortunately, most newsgroups are very specific, so this shouldn’t be too hard.

The quality of information that passes through some of these newsgroups is really quite amazing. If you post a question to the appropriate newsgroup, you will likely get helpful answers from many different people. The culture of Internet seems to dictate that everyone helps each other when possible, and it must be seen in action to be appreciated. Once, when I was researching the effects of certain pesticides, I posted some queries on sci.environment and I received over twenty replies from people with information or with ideas on where to get the information. One woman, without even an e-mail message to warn me, sent me valuable information on the pesticides by post mail (I had included my postal address in my original query). I also received a reply from someone at Monsanto, the company that manufactures some of the chemicals I
was looking into. There are a wide variety of people participating in the newsgroups, and that makes them a valuable resource.

There are also drawbacks to newsgroups. First of all, the amount of new posts coming into a busy newsgroup can be so overwhelming that it becomes futile to try and read all the new messages. Trying to keep up with it all, you’ll probably end up frustrated and not wanting to read anything in the newsgroup at all. It requires some patience to scan through all the subjects of a busy newsgroup, looking for a relevant article, but it can be done. When a newsgroup starts getting very unwieldy in this way, however, someone in the group usually suggests that the newsgroup be split into two or more newsgroups, each with a narrower focus.

This tendency for newsgroups to become very narrowly focused can lead to another problem. If someone is on-line to meet other people and experience the diverse interests there, newsgroups that are too narrowly focused may be counter-productive to this goal. This could also a consideration for environmental groups that want to form coalitions around broad social issues, since the Internet may not be structured to allow such diverse on-line communities. However, two points need to be stressed. First, the structure of newsgroups, as places for discussion on the Internet, is determined by the users of these groups. It is possible for users to agree on a more general topic if they so choose. Second, the Internet should be used as only one tool in the communication among activists. It is not a replacement for all the conventional means of dialog, but simply a convenient method of communication for some purposes. If this is held to
then the joining together of various points of view do not necessarily have to take place on the Internet itself.

Another drawback is that the quality of information on newsgroups, although many times very good, can often be very poor. Sometimes this is a symptom of the newsgroups itself, and other times it is simply due to a few people who clutter up the newsgroup with useless information. In the former case, it is necessary to avoid that particular newsgroup. In the latter case, however, it is possible to instruct your computer to automatically screen out a certain individual’s postings. In general, though, it is usually easy to distinguish newsgroups that have a reputation for quality information and discussion, and those that do not.

Talking to other people is what the Internet is used for most often, but information retrieval is a close second. There is an incredible amount of information out there, and better ways are constantly being created to access it. Initially, your only option was to use something called FTP or file transfer protocol. You would need to know the address of the computer where your data is, the name of the file containing the data you want, and where on the remote computer the data was. A typical FTP interface is not a very user-friendly program, but it does work and it is still used very often. Actually, it’s used all the time to transfer files, except now there are more user-friendly programs that act as a buffer between us and FTP.

For example, there’s the gopher service. Gopher was invented at the University of Minnesota and sports a menu-driven interface that catalogs information on the Internet. Each gopher menu item can be either a text file, a link to another gopher
menu, or a gateway to another computer system on the Internet. The power of gopher is apparent when you realize that there are over a thousand gopher servers (computers that provide gopher menus) and each menu can provide a link to any other gopher menu in the world. It became even more useful with the addition of gopher search tools, like veronica, that allow a user to search gopher menus for a specific string of text.

There are other services out there used to search the Internet, like the Wide Area Information Service (WAIS) and the World Wide Web (WWW or Web). The Web has gotten a lot of attention lately due to its ability to let users search through hypertext for text, graphics, and sound. Hypertext is just plain text that has links attached to certain words or phrases. For instance, in a document about cars there might be the phrase “GM” which is linked to another text file revealing the history of General Motors. Included in that link might be a picture of Roger Smith and perhaps a sound clip of a comment made by a factory worker in Flint, Michigan. Unfortunately, making use of this multimedia hypertext ability requires the appropriate type of computer running the right kind of software, requirements that many people using the Internet don’t currently have. So although the use of the Web is rapidly growing, tools like gopher remain very popular.

The communications abilities of the Internet, and the ease with which it allows people all over the world to exchange information, can have a tremendous impact on our society. The television, another important medium of communications, also had an impact on our society—an impact most of would just as soon forget. But, the Internet
is a horse of a different color in the world of communications mediums, and that might make all the difference.
Medium Considerations

"The issue is no longer whether we will enter an information age. That part has been settled. We have. What is at issue is whether the information age is something that happens to us, or something that happens for us. Fortunately that decision still remains in our hands."—Dr. Tom Grundner, president of the National Public Telecomputing Network, and the founder of the Cleveland Freenet.

Many-to-Many Versus One-to-Many

The Internet, as a form of communication, is an example of a medium that is many-to-many. In a many-to-many system, anyone using the system has the ability to send information to anyone else using the system—a situation not unlike postal mail, except that the Internet is much faster and has all the benefits mentioned above due to its electronic nature. The telephone is also a many-to-many device, although again it is not as versatile as the Internet is. A fax can be considered very fast postal mail and is also many-to-many.

Television and radio are examples of one-to-many mediums, although few-to-many may be more accurate. In a one-to-many system, only one (or a few) people in the system can transmit information, everyone else can only receive it. The people on the receiving end don’t get a chance to respond to the source of information. Some TV and radio programs do offer call-ins, where people can express their views, but these are rare and the small number of people calling do not necessarily represent the viewing audience (and they’re using another medium to do it).

This is not to say that one-to-many communications are not useful. Sending information in this way is very practical when a message needs to be sent to the most people in the least amount of time, which is the case in emergencies for example. One-to-many communications, however, are centralizing technologies since control of the
information and transmission rests with the one, not with the many. This fact also
makes technologies like television, and to a lesser extent radio, unsuitable for
democratic change and airing of progressive views.

Of course, one-to-many mediums do not rule out democracy simply by virtue of
their existence. Television stations could exist for the dissemination of all ideas, giving
equal access to the public. The reason this does not happen is due to the corporate
structure of the mass media, a structure in which a few corporations have the resources
necessary to dominate radio and television. Although this model holds for both
television and radio, it is more prevalent in the area of television due to the higher costs
involved in television transmission.

Bagdikian, in a 1989 Nation article, predicted that by the turn of the century
“five to ten corporate giants will control most of the world’s important newspapers,
magazines, books, broadcast stations, movies, recordings and videocassettes.” Both
television and radio have as their primary sources institutions who profit from selling
audiences to advertisers, with this profit being their primary motive. Even disregarding
the centralizing effect of these technologies, the information available on these media is
heavily influenced by this commercial aspect. Under these circumstances it’s no
surprise that views contrary to the corporate world-view are marginalized. Progressive
organizations have consistently found it difficult to operate within this paradigm. After
all, progressive ideas generally don’t mesh too well with the profit motive.

In a commercial atmosphere, this lack of alternatives is very attractive. The
less choice viewers have, the more likely it is that they will see a particular advertiser’s
message. However, in a society that gets a large part of its information from television, such a lack of alternatives runs counter to democratic ideals, and concentrates enormous power in the hands of the already-elite segment of society. One-to-many mediums are most susceptible to this form of corruption, since it's easy for a handful of powerful corporations to dominate what most people see and hear in our society.

**CMC As Many-to-Many**

Computer-mediated communication breathed new life and possibilities into the arena of many-to-many media. BBS's are a typical example of this—users call in and leave messages for everyone else, with the knowledge that everyone has the ability to respond. In theory, it is possible to use CMC in a one-to-many fashion, but since technologies already exist to do this, there hasn’t been an incentive to use computers in this way. Computer networks have made the possibility of democratic many-to-many communication possible on a world-wide level.

Like fax machines and video recorders, CMC has a decentralizing effect on the creation and distribution of information in our society. Many grassroots organizations, for example, make use of fax networks to rapidly distribute information each other, and to concerned citizens. Information can now be easily produced and distributed to people all over the world by individuals and small organizations. The Association for Progressive Communications (APC), for instance is an organization that connects small computer networks all over the world. Large systems connected to the Internet and small systems communicating with FidoNet are all a part of the APC. This
arrangement allows very simple technology to link regions in the world where telephone quality might be poor and connectivity to other networks is lacking. For instance, a user in Fiji can send e-mail to someone in Rwanda. The message starts on the PACTOK FidoNet network which is linked to Australia (Pegasus), then is transmitted to the US (IGC), on to England (GreenNet), and finally to the KبونET in Rwanda. The trip from the Pegasus network to the IGC network would probably be done using the Internet.

To be decentralized, however, there must be great efforts to ensure that many-to-many technologies are available to everyone. Obviously, if these technologies are only concentrated in the hands of the powerful, then only the powerful will be able to take advantage of them. Fortunately, the tools required for CMC are relatively inexpensive for most grassroots organizations. All of the six environmental organizations I interviewed in Missoula, Montana, for example, have computers and they already make some use of CMC on a regular basis (see Appendix B for a list of the organizations). Computers seem to be ubiquitous pieces of equipment in even the smallest organizations, and with the addition of a modem and the right software, anyone can make use of CMC.

The Internet is a many-to-many medium, just like any other form of CMC, because everyone connected to the Internet has the ability to transmit information to everyone else who's connected. You can send messages to whom you like, be on whatever mailing lists you want to, and subscribe to whatever newsgroups interest you. Most important, however, is that fact that you are free to create your own mailing lists
and newsgroups. On the Internet you don't have to be a passive consumer of information, everyone can create and distribute information. The situation becomes even more promising for nonprofit organizations who can create gopher and Web servers to disseminate information on-line.

E-mail, newsgroups, and mailing lists all combine to give the Internet its democratic character. There is some structure, of course, to the implementation of these various services, but no central authority exists which controls access to it all. The Internet has been described as an anarchy, and in some sense it is, but there has also been a lot of effort directed at organizing the information into useful forms. Examples of this include services such as gopher, the Web, and people's efforts to organize the newsgroups into meaningful hierarchies.

The "Many" in Many-to-Many

Many-to-many communications can only fulfill their democratic potential if everyone has access to them. If not, there won't be any "many" in the many-to-many. As egalitarian as the Internet sounds, therefore, only people with access to the Internet can actually participate. For those without access, the world will be as one-sided as ever. This is vitally important to the environmental movement—after all, what good is disseminating information on the Internet, if no one will see it?

Environmental organizations do not operate in a vacuum. Instead, they operate within a broad social context that must be recognized and addressed as an important issue in its own right. The shape of the Internet is being determined now, and there is a marvelous, even unique, opportunity here to make sure that society as a whole
benefits from this technology. Unless people have universal access to the Internet, though, this won't happen, and universal access can only be realized by the hard work of those who really want to see it happen.

In addition to the question of who will have access to the Internet, there is the question of what we will find there once we’re on-line. What will the content be like? The last thing we’ll want to see is the Internet dominated by shopping malls and video games. Of these two questions, however, I feel that access deserves a bit more attention at the moment than content. If access to the Internet is ubiquitous, and if those who have access are free to publish on the Internet in the form of mailing lists, gopher servers, World Wide Web servers, etc., then content will take care of itself. Only when people's access and their ability to communicate freely is restricted in some way will the content of the Internet be severely affected.

Low cost is a necessary precursor to ubiquitous access to the Internet. It is also necessary to keep the cost of providing information on the Internet as low as possible, for by doing this we can avoid the same corruption that over-took television. Disseminating information via television is extremely expensive, and this makes television a very elite communication device. The same holds true for radio and even print media, although desktop publishing has worked wonders for the print media. As of the moment, disseminating information via the Internet is far less costly than doing the same in television, radio, or even in print (depending on the size of the endeavor, of course). For the sake of the democratic nature of the Internet, this low cost needs to be maintained in any way possible.
Achieving Universal Access

Talking about universal access and achieving it are obviously two very different things. The government is in the process of working out the details to the National Information Infrastructure (NII), the plan to upgrade the telecommunications capacity in the US (also known as the information superhighway, which I'll talk more about later). There has already been considerable debate concerning the elements of this plan, including the concept of universal access. The current legislation fails to establish guidelines for this need, and many commentators focus on this area. The technological issues involved in the deployment of the NII seem to overshadow the social factors in this debate, although the latter receive occasional lip service.

The key to providing universal access to the Internet lies in setting goals and evaluating our progress toward these goals. Heather E. Hudson, in “Toward a National Telecommunications and Information Policy: A Development-Based Vision,” suggests such a goal-oriented strategy in the pursuit of NII. She gives examples of goals to used in measuring the progress of the implementation of NII which includes the notion of universal access. In fact, she proposes this list as a means to ensure universal access as the most important aspect of NII’s implementation. The list of goals include national percentages of access to certain services and of pricing structures. However, it is not enough to simply make these goals secondary to NII’s technological goals, they must be the primary consideration in its implementation.

Although public libraries haven’t yet, they can play an important role in providing access to the Internet. In fact, the principles embodied by such groups as the
American Library Association can be incorporated in the discussion on general access to the Internet and to the regulation of information on it. These principles stress the freedom of all individuals to have access to all types of information and the role of libraries in protecting intellectual freedom. In order for public libraries to play a significant part in these issues, federal funding should be set aside for use by libraries for the purpose of providing access to, and training for using, the Internet.

Among public libraries, however, there is a great disparity between those in rural areas and those in urban areas. Public libraries in urban areas tend to have better access and more use of the Internet. In a report headed by Charles McClure in 1994, it was found that urban libraries were connected to the Internet 78.9% of the time, while rural libraries were connected 16.8% of the time. For the purpose of their study, urban libraries were defined as having a population of legal service area of 250,000 or greater, and rural libraries were defined as having a population of legal service area of 25,000 or less.

This trend, of course, is not compatible with the goal of universal access to the Internet and so it must be addressed if public libraries are to play a significant role in achieving that goal. In fact, the McClure study found that even if a public library had a connection to the Internet, only 12.7% of them provided public access terminals. Public libraries, therefore, must also be encouraged to provide more direct public access to the Internet.

Another useful entity that might play a big role in the future of Internet access is the National Public Telecomputing Network (NPTN). NPTN president, Tom
Grundner, started what are now known as freenets, CMC systems that focus on the needs of local communities. The first freenet was in Cleveland, Ohio, and now there are many more as NPTN works to establish more freenets for communities across the US. Apart from the civic-oriented services of freenets, some also provide Internet access for the community. Currently, NPTN is working towards creating a federally-funded organization, similar to the Corporation for Public Broadcasting, to support freenets in communities across the US. Hopefully, if such an organization does come into being, it won't fall prey to the same corporate involvement seen today in the Corporation for Public Broadcasting.

As the Internet has grown in popularity, groups working on diverse social, political, and environmental issues have started using it as a powerful tool to communicate with one another and to disseminate useful information. Colonizing the Internet and making the best use of it for societal change is the first step, but this issue is so vital and the timing is so critical that it's also necessary for these colonizing organizations to become informed as to the nature of the coming "information superhighway." If we want the many-to-many medium that is the Internet to live up to its potential, it's imperative that organizations such as these take an interest in the future of the Internet.

The logical first step in developing a vested interest in the Internet is to go on-line. It is encouraging, then, to note that in the past few years there has been an increase in the number of environmental organizations, as well as other progressive organizations, making use of CMC. Even in Missoula, Montana, various small environmental organizations are using it. This surge of interest in getting on-line can
be measured, and one way of doing so is to take a look at an organization that is responsible for getting more progressive organizations on-line than any other. The Institute for Global Communications (IGC) is leading the effort to colonize the Internet.
A Good Example: IGC

The History of IGC

The information concerning the history of IGC is attributable to Susan Salin’s “The Association for Progressive Communications: A Cooperative Effort Meet the Information Needs of Non-Governmental Organizations.” IGC was created in 1987 to manage EcoNet, the computer network for the environmental movement, and PeaceNet, the computer network for the global peace and social justice community. EcoNet and PeaceNet existed as separate entities before their incorporation into IGC—The Farallones Institute managed EcoNet before that. IGC was created for legal, technical, and organizational purposes. For instance, the Farallones Institute felt that it no longer had the technical expertise necessary for the growth of EcoNet. Currently, IGC is composed of four networks: PeaceNet, EcoNet, ConflictNet, and LaborNet. ConflictNet joined IGC in 1989, and LaborNet joined in 1992.

Funds for IGC have come from a variety of large foundations. The MacArthur Foundation contributed the first $60,000 to start PeaceNet, and the Pew Charitable Trust helped EcoNet get off the ground. The Ford Foundation supports IGC, and has given small to mid-size grants to them over the years. User fees enable IGC to attain a certain degree of self-sufficiency as they cover most of IGC’s costs for basic operations. Geoff Sears, IGC executive director, is responsible for fundraising, and has been pursuing money for specific projects related to each network.

IGC is a division of the Tides Foundation, a tax-exempt organization, which receives 5.5% of IGC’s revenue. This money is used by Tides to provide
bookkeeping, payroll, tax return preparation, and legal aid services to IGC. In addition, the Board of Directors of the Tides Foundation is fiscally responsible for IGC. In addition, though, IGC maintains its own advisory board which currently numbers eleven. This board, of which Geoff Sears is a member, generally discusses funding objectives and the future direction of the organization.

The four networks that comprise IGC are actually part of one large network. In other words, the IGC network looks the same no matter which of the four you belong to. An EcoNet user and a PeaceNet user, for example, both have access to the same information when they log in to the IGC network. So why is there any differentiation at all? First, EcoNet and PeaceNet existed before IGC, and have a name recognition that ties in with their established user base. For marketing purposes, the names EcoNet and PeaceNet carry a lot of weight. Establishing separate types of user accounts also seems to create a sense of community within each of those groups. An environmental activist, for example, might feel more inclined to join EcoNet than PeaceNet. The users of the IGC network who are registered EcoNet users form an on-line environmental community.

The Growth of IGC

The IGC network has experienced continuous growth since its inception in all four networks as shown in Figure 3 (source: Jillaine Smith, Acting Eastern Office Director of IGC). Overall, the IGC network experienced a seventeen percent increase in its number of users in 1994, from 8,934 in January, 1994 to 10,426 in December, 1994. Of these 1,492 new users, 605 joined PeaceNet, 353 joined EcoNet, 329 joined
ConflictNet, and 205 joined LaborNet. In terms of absolute figures, PeaceNet is the one network most responsible for this growth, however, ConflictNet and LaborNet have grown fastest relative to their size one year ago. ConflictNet increased in size by 73% and LaborNet by 99%.

![Figure 3: The growth of IGC](image)

PeaceNet has always had more users than any of the other three networks, and it currently has 48% of them. EcoNet has forty percent of the users, followed by ConflictNet with eight percent, and LaborNet with four percent (see Figure 4, source: Jillaine Smith). It seems clear that the relatively large number of users of PeaceNet and EcoNet are due to their large user bases that existed prior to becoming part of IGC. The figures for the number of users on each network can be misleading, though, since a given username might represent a group of people or even a whole organization. The constituency for each network may also differ. ConflictNet, for instance, caters mostly to conflict resolution professionals and not to activists.
For a user of one of IGC's four networks, however, there is much more here than meets the eye. IGC is the United States node of a worldwide network of networks called the Association for Progressive Communications (APC). APC began formally as an organization in 1990, but by then seven networks were already part of it. It started with IGC and GreenNet (the United Kingdom network) in 1987 when these two progressive networks joined together to allow their users to share their collective resources. In 1988 Canada's network, Web, joined with IGC and GreenNet. In 1989 four more networks joined in—NordNet in Sweden, Nicaragua in Nicaragua, AlterNex in Brazil, and Pegasus in Australia. Together, these seven networks formally founded APC.

Today, there are nineteen APC member networks in the world (see Figure 5). In addition to these, there are 38 partner networks scattered across the globe. The difference between a member network and a partner network is that member networks form the backbone of APC. They are connected via telephone networks and the

Figure 4: Users on each of IGC's networks
Internet. Partner networks are smaller nodes that connect to the member networks (and thus to each other) using less complicated technology (for example, PACTOK, which links small Pacific island countries to Pegasus, uses FidoNet).

<table>
<thead>
<tr>
<th>AlterNex (Brazil)</th>
<th>IGC (USA)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Antenna (Netherlands)</td>
<td>LaNeta (Mexico)</td>
</tr>
<tr>
<td>Chasque (Uruguay)</td>
<td>Nicarao (Nicaragua)</td>
</tr>
<tr>
<td>ColNodo (Columbia)</td>
<td>NordNet (Sweden)</td>
</tr>
<tr>
<td>ComLink e.V. (Germany)</td>
<td>Pegasus (Australia)</td>
</tr>
<tr>
<td>Ecuanex (Ecuador)</td>
<td>PlaNet (New Zealand)</td>
</tr>
<tr>
<td>GlasNet (Russia)</td>
<td>SangoNet (South Africa)</td>
</tr>
<tr>
<td>GLUK (Ukraine)</td>
<td>Wamani (Argentina)</td>
</tr>
<tr>
<td>GreenNet (England)</td>
<td>Web (Canada)</td>
</tr>
<tr>
<td>Histria (Slovenija)</td>
<td></td>
</tr>
</tbody>
</table>

**Figure 5: APC Member Networks**

**Using the IGC Network**

So, what type of services are available to you if you join, say, EcoNet? First and foremost, you get the ability to send and receive e-mail. You can exchange e-mail with any other member of an IGC network, with any member of the APC networks, and even with anyone who has an Internet address. That last part is important. As I've already discussed, the Internet is a big place, and being able to exchange e-mail with people on the Internet opens up a whole world of possibilities. The IGC networks also provide fax and telex services, so you can send these kinds of documents straight from your computer.

In addition to e-mail, the IGC networks (and APC) maintain a large selection of electronic conferences (see Figure 6). These conferences are equivalent to the netnews I mentioned earlier—public places where people post messages and receive public replies. The list of conferences is enormous. The last time I checked, the list of
conferences included 3730 netnews conferences, 1033 APC conferences, 258 BitNet and Internet mailing lists, and thirteen FidoNet conferences. This gives us a grand total of 5034 conferences from which to choose. Of course, the number of conferences is changing all the time as new ones are added and unused ones are removed. The number of conferences can be deceptive, however, because many of these conferences, although not in use, have not yet been deleted. Even removing the obsolete conferences, however, there is still an amazing amount of material to choose from.

<table>
<thead>
<tr>
<th>Conference</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>dev.worldbank</td>
<td>News and discussion of World Bank activities and their impact on the environment, development and economics of the world, especially third world countries.</td>
</tr>
<tr>
<td>ef.journal</td>
<td>This conference contains sample articles from the Earth First Journal, as well as other information about Earth First!</td>
</tr>
<tr>
<td>env.education</td>
<td>List of selected publications, events &amp; awards of interest to environmental educators.</td>
</tr>
<tr>
<td>env.justice</td>
<td>Information and discussion about environmental justice issues facing people and communities of color.</td>
</tr>
<tr>
<td>env.letters</td>
<td>Sample letters to politicians, corporations, bureaucracies, world bank etc. on environmental and indigenous issues as such letters are needed.</td>
</tr>
<tr>
<td>env.marine</td>
<td>Information and discussion about the marine environment, including seas, creatures that inhabit them and impact of humankind on marine life.</td>
</tr>
<tr>
<td>haz.pesticides</td>
<td>Information and discussion about the use of pesticides and their impact on health and the environment.</td>
</tr>
<tr>
<td>toxics.rachel</td>
<td>Library of RACHEL's Hazardous Waste Newsletter, published by the Environmental Research Foundation.</td>
</tr>
</tbody>
</table>

**Figure 6: Sample EcoNet conferences**

With all those conferences, it's easy to get lost in tons of information on EcoNet, but the solution is to make sure you're focused. No one can be expected to read all the new messages coming into every conference, so the trick is to select only the conferences that are of particular interest to you. The conference service at IGC includes an option that lets you create a "regular conference list." If you use this option, you can create a list of conferences that interest you and that you can scan quickly for new messages.
The two most prolific sets of conferences are the APC conferences and netnews, and there are three times as many netnews newsgroups as there are APC conferences. With a figure like that, why would you even bother with the APC conferences? Well, each set of conferences has its advantages. The APC conferences, although fewer in number, tend to have much more focused subject areas. In fact, quite a few of the APC conferences are sponsored by organizations that belong to an IGC network. For example, Rainforest Action Network and Pesticide Action Network both offer conferences relating to the activities of their organizations.

Netnews newsgroups, on the other hand, are more nebulous in their topics, but usually have a much higher participation rate due to the sheer number of people who have access to them. Anyone with Internet access (including IGC users) can participate in the netnews newsgroups, but APC conferences can only be accessed by people with accounts on IGC (or another APC member). In my case, I use both sets of conferences depending on which I need. If I have a nebulous question that could benefit from a very wide readership, I use netnews. If I want information about a very specific topic I'll go to an APC conference.

In addition to e-mail and conferences, there are also many on-line databases available to IGC users (see Figure 7). These databases include directories, news services, newsletters, bibliographies, library catalogs, and other resources. If you need to find information about a particular person, an organization, or people concerned with a certain issue, you can check out the user directory which let's you quickly find
users of any of the IGC networks. If you prefer to remain anonymous and not be listed in the directory, you can get an anonymous account.

<table>
<thead>
<tr>
<th>EDF Directory of Scientists</th>
<th>The Multinational Monitor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rocky Mtn. Environmental Directory</td>
<td>Sierra Club Newsletter</td>
</tr>
<tr>
<td>Environmental Education Funders</td>
<td>The Earth Times</td>
</tr>
<tr>
<td>People of Color Environmental Groups Directory</td>
<td>Events Calendar</td>
</tr>
<tr>
<td>NWF Conservation Directory</td>
<td>UN List of National Parks and Protected Areas</td>
</tr>
<tr>
<td>Greenpeace Press Releases</td>
<td>Final Agenda 21 from the UN Conference on Environment and Development</td>
</tr>
<tr>
<td>Greenpeace Toxic Trade Updates</td>
<td>USDA Current Research Information System</td>
</tr>
<tr>
<td>Pesticide Information Service</td>
<td>RACHEL's Hazardous Waste News</td>
</tr>
</tbody>
</table>

**Figure 7: Sample IGC Databases**

The Internet plays a large role in IGC's and the APC's operations. Eleven of the APC member networks are Internet hosts (AlterNex, GlasNet, GLUK, GreenNet, Histria, IGC, NordNet, Pegasus, PlaNet, SangoNet, Web), so these networks can directly communicate with each other over the Internet. This means that information is exchanged between these networks as fast as it is generated, speeding up the operation of the APC in general. IGC's direct connection to the Internet allows IGC users to make use of all the Internet's resources—exchanging e-mail with anyone on the Internet, connecting to other computers on the Internet, and using information services like gopher and the Web. It also works the other way. If you have access to the Internet and you an account with EcoNet, you can get to EcoNet directly via the Internet instead of dialing in.

IGC operates its own gopher on the Internet (*gopher.igc.apc.org*). This gopher contains information pertaining to EcoNet, PeaceNet, ConflictNet, and LaborNet. Many of the environmental organizations on EcoNet are represented on the gopher (see Figure 8), either publishing their newsletters there or giving other types of information.
Anyone with access to the Internet can make use of the information on the IGC gopher, which makes it a valuable resource for environmental activists and organizations online.

<table>
<thead>
<tr>
<th>Alaska Boreal Forest Council</th>
<th>Greens/Green Party</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alaska Wilderness League</td>
<td>Hunger Project - Africa Prize for Leadership</td>
</tr>
<tr>
<td>American Rivers</td>
<td>Indigenous Environmental Network</td>
</tr>
<tr>
<td>American Wind Energy Association</td>
<td>Institute for Agriculture and Trade Policy</td>
</tr>
<tr>
<td>Center for Third World Organizing</td>
<td>Institute for Social and Economic Studies</td>
</tr>
<tr>
<td>Earth First!</td>
<td>International Arctic Project</td>
</tr>
<tr>
<td>Earth Force</td>
<td>League of Conservation Voters</td>
</tr>
<tr>
<td>Earth Negotiations Bulletin</td>
<td>Natural Resources Defense Council</td>
</tr>
<tr>
<td>Environmental Defense Fund</td>
<td>Pesticide Action Network North America</td>
</tr>
<tr>
<td>Environmental Law Alliance Worldwide</td>
<td>Rainforest Action Network</td>
</tr>
<tr>
<td>Environmental Research Foundation</td>
<td>Sierra Club Action Alerts</td>
</tr>
<tr>
<td>Global Rivers Environmental Education Network</td>
<td>Taiga Rescue Network</td>
</tr>
<tr>
<td>Goldman Environmental Foundation</td>
<td>Urban Habitat Project of the Earth Island Institute</td>
</tr>
<tr>
<td>Green Means</td>
<td>Women's Environment &amp; Development Organization</td>
</tr>
<tr>
<td>GreenDisk</td>
<td>Women's Organizations On-Line</td>
</tr>
<tr>
<td>Greenpeace</td>
<td>Worldwatch Institute</td>
</tr>
</tbody>
</table>

**Figure 8: Some organizations on the IGC gopher**

In addition to their gopher, IGC has a Web site ([http://www.igc.apc.org](http://www.igc.apc.org)). They have put many of their resources here, including a pointer to other environmental Web sites. Jillaine Smith, IGC acting eastern office director, is currently in the process of helping organizations publish their own materials on IGC's Web site. Once an organization puts their information on the IGC Web site, anyone browsing the Web has access to it. The information can be in the form of text and graphics, and it can be linked to other Web sites.

IGC's stated goal is to provide "computer networking tools for international communication and information exchange...dedicated solely to environmental preservation, peace, and human rights." So, is IGC succeeding in its goal? Well, that depends on who you talk to. The organizations that are already connected to EcoNet,
for example, are enjoying the benefits that the connection offers them, but there are many grassroots groups that aren’t connected yet, either due to cost, lack of time, or lack of motivation. IGC seems to understand the necessity of avoiding an imbalance caused by a lack of grassroots participation in their networks, since they’ve worked with many grassroots groups before. There is also a need for them to pursue larger mainstream groups, however, because of the resources such groups have to offer the networks. For example, there’s the Conservation Directory provided by the National Wildlife Federation.

Part of the problem in getting grassroots organizations connected is the cost, but according to Jillaine Smith, there’s a more fundamental issue at work:

Probably the biggest challenge I’ve encountered is not so much the cost involved in the subscription, but the fact that turnover is often incredibly high, or volunteers are the ones who know how to use EcoNet and then they leave. The challenge is getting the folks “at the top” to buy into the use and value of the network. They tend to hang around longer, and if they don’t use it themselves, but understand the value of it, at least they make it a priority for other staff to use. But it’s often not the people at the top who really understand the value of the nets. So that’s a challenge. But one that more and more organizations seem to be meeting.

If the Internet is to succeed as a tool for social change, a wide variety of interests must be represented on-line. This is why it is so important to get grassroots organizations on-line as effectively as possible. Some of the possible obstacles to moving on-line are people’s attitudes, the cost of getting on-line, and the ability to use CMC effectively.
Moving On-line

“Despite its current (and perhaps in some areas permanent) insufficiencies, we should go to cyberspace with hope. Groundless hope, like unconditional love, may be the only kind that counts”—John Perry Barlow, co-founder of the Electronic Frontier Foundation

In an effort to better understand some of the issues surrounding the movement of environmental organizations on-line, I surveyed six environmental groups in Missoula, Montana. The groups were chosen at random, but they do a good job of representing Missoula. A list of the organizations surveyed, the questions asked, and all of their responses can be found in Appendix B.

Attitudes

Among the obstacles to getting more environmental organizations on-line, and having them make effective use of being on-line, is people’s attitudes towards CMC. There are some who believe that computer technology is one of the malevolent byproducts of industrial society, and that environmental groups should therefore avoid it. This attitude may stem from the fact that computer technology is grounded in the profit motives of huge corporations, and that those who benefit most from computer technology are the ones who already represent the elite in our society. Other concerns include the environmental or social consequences of computers.

As far as the former concern goes, it is a good idea to be concerned with the environmental impacts of building computers—in the same way that we are concerned about the impacts of the automobile and the airplane. The environmental consequences of these technologies must be addressed, but it might not be prudent to suggest that environmental activists give up all forms of fossil fuel powered vehicles. Such abstinence could provide an even greater advantage to those who abuse the planet.
In much the same way, it may be unwise to suggest that environmental organizations not make the best use of computer-mediated communications to advance their causes. However, while making the most of this technology we should attempt to make the industry as "green" as possible. As users of computer technology, we should take some interest in making sure that the manufacture and use of these items is as environmentally friendly as possible. For example, the EPA has created the Energy Star program. Any computer equipment meeting these energy efficiency standards gets an Energy Star label.

As an example of the fear of the more societal impacts of computer technology take the following passage written by Franklin Saige (Saige, 1995):

...I would have to become like my friends in the ecology movement, connected to computer networks in order to exchange information and get organized. I see technology encouraging in them precisely the way of relating to lived experience that has brought about the crises they seek to alleviate. My strategy for exiting the information superhighway is simply never to enter it. The only "direct action" I can take is to live a real life, in real time, without viewing or networking or overconsuming anything. No input, no output. And I am going to tell anyone who will listen that real life, in a real community, in real reality, is better than the virtual reality of the information superhighway any day of the week.

This passage exemplifies the attitudes of many who turn their backs on CMC in general and the Internet in particular. Saige is correct when he states that nothing could replace real life in a real community, however, the existence of CMC does not in any way need to keep anyone away from real communities. Some people, of course, might withdraw into an electronic world, but this does not mean that CMC and local communities are mutually exclusive entities. In fact, CMC can be used to strengthen local communities, as demonstrated by Dr. Tom Grundner public-access community networks—FreeNets. It is possible to use CMC as a tool for social change, and at the
same time be vigilant to any unwanted changes that CMC might bring. And it is important to be vigilant. Just look at where television has gone after all the initial hype about how it was going to change the world for the better.

The fact that the medium of television, after being touted as a powerful progressive and educational tool turned out so poorly, supports the argument that technology produced by the powers-that-be cannot be used to tip the scales against them. Many people feel that since the production of computers and related technology is hopelessly entwined in the consumption orientation of American society, we cannot use computers without supporting a corporate sponsored paradigm. Essentially, this argument maintains that computers are a centralizing force in our society, and it has been put forth, for example, by Jerry Mander in his book *In the Absence of the Sacred*. In his chapter on computers, he writes:

This is a *hot idea*: we take their invention and use a kind of jiujitsu to turn it against its creators. Tempting, but it fails to reckon with the intrinsic aspects of computers that will inevitably result in centralization. The issue is confused at the outset by the fact that computers have the look of a small-scale democratic technology. People have them at home and find them empowering for themselves and their organizations. They are helpful in many ways and offer considerable personal control, unlike non-yielding technologies like television. Small social and political groups find computers valuable for information storage, networking, processing mailing lists, preparing clean copy, maintaining membership lists, keeping accounts, and so on. Yet all this begs the question. The real issue is not whether computers can benefit you or your group; the question is who benefits most from the existence of computers in society? The answer suggests that, for all of their small-scale benefits, the largest institutions have far more to gain, and they know it.

Mander’s question, “who benefits most,” is not easy to answer, because there is more than one way in which people are benefiting from computers. It is true that computer technology gives large corporations enormous power. Do corporations make profit hand-over-fist from computer technology? Of course they do. Do corporations
use computer technology to further their own ends? Yes, indeed. But as corporations proceed to reap their profits, something else is happening. CMC is allowing people to communicate more freely than ever before, and may prove to be an important tool for democracy.

As I mentioned earlier, I interviewed six representatives of local environmental organizations in Missoula, Montana, asking them questions related to their use of CMC and the Internet. All six of these organizations are making use of CMC in one form or another. Without exception, their attitude towards CMC was that of a tool to be used in the most beneficial way possible. Computers are seen as standard pieces of office equipment, and, as one of the respondents put it, he believes that e-mail will soon become as standard a means of communication as the telephone. No one I interviewed saw computers as inherently dangerous in any way, although some expressed some concern that employees might waste time fooling around with CMC. In contrast, they all felt that CMC was a valuable, and in some cases even an essential, part of their work.

The ways in which computers decentralize the generation and dissemination of information are quite evident, in much the same way as do the video recorder and the fax machine. This may be able to offset the centralizing effects that Mander discusses. Computer manufacturer's of the world might get richer selling us their computers, but those computers will be used in CMC systems that give us the ability to freely communicate with one another cheaply and quickly.
CMC represents an opportunity. At the user level, computer technology and especially CMC could promote the decentralization of information production and distribution. The turning-the-tables scenario that Mander painted can happen, but it might not be easy. In any event, there will be no deus ex machina that wipes computer technology from the planet, so our choice is how to put it to best use. The consequences of not using it should be apparent—as one of the respondents in my survey put it, she felt compelled to use CMC effectively, because the environmental movement’s opponents are already using it in this way. *The Greenpeace Guide to Anti-Environmental Organizations*, for example, lists the following organizations, all of which have electronic bulletin board systems.

- Blue Ribbon Coalition (“preserving our natural resources for the public instead of from the public”)
- National Inholders Association (“Parks are like aspirin. Two can be helpful, but a hundred will put you in the hospital.”)
- Sahara Club (Greenpeace is “a bunch of lying, evil, cretinous, scum-sucking, larcenous, vile, money-grubbing bastards.”)

One unfortunate development that shapes peoples’ attitudes toward CMC is the information superhighway. All of the representatives I interviewed in Missoula had heard of the information superhighway, but their feelings about it varied. Concern was expressed over its depersonalizing nature, but there was also excitement about the opportunities it presented for bridging an information gap in our society. One respondent suggested that access to global information might serve to disempower people in a local setting—to empower these people local information needs to be made.
accessible. In cases where people are experiencing the same problems, however, sharing global information would probably help.

There is some confusion in the way people perceive the information superhighway, but it is important to understand that CMC, the Internet, and the information superhighway are not synonymous. The information superhighway is industry’s vision of the nation’s telecommunications infrastructure in the 21st century. You should be concerned with that vision (something I’ll get to in the next section), but the Internet is still evolving and no one has a crystal ball powerful enough to see where it’s going.

There’s also been much written about the idea of virtual communities, some cite it as a virtue, while others claim that there is no such thing and that to suggest otherwise helps to destroy real communities. Some take this argument further and claim that the whole of the Internet is simply a virtual existence, and therefore (and this conclusion isn’t exactly foregone, of course) has little value compared with “real reality.” With real life being undermined at every turn, how can we tolerate this poor virtual substitute?

Well, I can understand the importance of this question, but really, there’s nothing virtual about e-mail. There’s nothing virtual about the information to be had on-line, and there’s nothing virtual in one’s ability to disseminate information. I’m often amused when people suggest that the Internet is virtual reality. If it is then so is the postal service and the telephone. Are the paper letters I send to my friend more real than my electronic correspondence with him? We can accomplish many of the
same things in either medium. Is a conversation virtual by virtue of the fact that both parties can only see what the other is typing? Well, that would render my current communication with the reader virtual.

Getting back to communities, however, I can see where the term “virtual community” can apply to a community not occupying a physical space. Of course, this is not anything new or unique to CMC, but the Internet does allow this type of information sharing to take place on a much larger scale, and much faster too. For me, the discussion comparing virtual communities and physical communities is about as useful as wondering how many angels can dance on the head of a pin. More useful would be looking at the nature of virtual communities as entities in and of themselves. I think most people realize that virtual communities are not a replacement for real communities, but they are valid social constructs in their own right.

The term “virtual” in “virtual community” refers to the geographic separation among the individuals participating in long-distance electronic communication. In all other regards, the interactions that take place among these interested parties are as real as any other. One important feature of on-line communities, however, is that (like some physical counterparts) it attracts people with common interests. An example of this would be the conferences on EcoNet. This is one of the primary reasons why electronic community building is very important for environmental activists. This binding people together using CMC is a powerful force, because people who feel part of a larger movement, more connected to something substantial, are also more likely to feel empowered in their actions.
Paying For It

So, assuming that you want to get on-line to enjoy whatever benefits can be had in doing so, what kind of obstacles will stand in your way. The most fundamental issue here would have to be cost—if it costs too much money to get on-line it just won’t happen. There are many different flavors of connection out there. Since the Internet has gained in popularity (surely an understatement), an incredible number of service providers have sprung up, seemingly out of nowhere. Trying to decide what type of connection to get can be frustrating, but, of course, it’s worth it in the long run.

The first requirement to get on-line is a computer and a modem. This requirement may sound trivial to some, but there are many small grassroots organizations for which getting a computer and a modem is a major expense. If all you wanted to use the computer for were CMC and perhaps a little word processing, then $1500 should buy you a decent low-end model. The modem will cost about $120—there are cheaper models, but it’s not wise to skimp on the modem. So, $1620 later, you’re ready to get on-line. Now, that’s the minimum you need, but most organizations would also want to get a printer, so why not just make it an even $2000?

You have a computer and a modem, so let’s say you want to join EcoNet. There’s a $15 startup fee which provides you with appropriate software and a manual. We’ll assume for the moment that you have a PC with Windows, and that you want to use the nifty graphical software that EcoNet sports for use with Windows. There is no charge for this software (called InterACT) currently, but you’d probably do well to get
the manual for it which costs $10. So, you're all ready to go for a small start-up fee of $25.

After the one-time start-up fee, however, there are the recurring costs to consider. There's a straight $12.50 charge per month to use EcoNet. For that $12.50 you get six hours of free time on-line a month, but anything over that costs $1 an hour.

Now, the amount of time a person, or organization, spends on-line is very dependent on that user's needs. If you like to cruise around the Internet, searching for information, then thirty hours a month on-line is probably a realistic figure. That might sound like a lot, but believe me, it isn't. On the other hand, if you just want to check your e-mail, a few conferences maybe, and then logout, you don't need that much time at all. Using EcoNet for cruising the Internet simply isn't cost-effective, so let's assume for the moment that you're going to choose the latter course. This is a perfectly reasonable choice, evidenced by the fact that all of the local environmental groups I talked to fall into this use category, and half of them subscribe to EcoNet.

IGC tries very hard to make the use of EcoNet as quick and painless as possible. One of the ways to minimize the amount of time you spend on-line is to read your e-mail and compose messages you'd like to send off-line. EcoNet's software allows you to do this. First you connect to EcoNet, download all your new e-mail to your personal computer, and disconnect from EcoNet. Once you're off-line, and the meter isn't ticking, you can read your e-mail and compose new messages or replies at your leisure. When you're done composing e-mail messages that you'd like to send, you re-connect to EcoNet and send all your e-mail at one time. Reading and
composing messages off-line this way can save a lot of time, but currently EcoNet provides no way to do the same thing for conferences. You can still compose messages off-line that you intend to post to conferences, but you can’t automatically download all the new messages in conferences you’re interested in.

OK, so let’s say you’re going to be a very conscientious user, and you’ll use all the modern conveniences to minimize your time on-line. And maybe you’ll check a few conferences, too. If you want to use e-mail as a standard means of communication, you should check it once per day. After all, what good is communicating via such a fast medium if you don’t check it regularly? If you’re good at it, you can do all you need to do on EcoNet in about ten minutes. That’s about three and a half hours a month. That’s still within the free six hours you get for $12.50 a month. Unfortunately, though, there’s are other costs involved. Everything we’ve calculated so far are the costs IGC charges you to use EcoNet, but there’s still the matter of calling IGC’s computers with your modem.

If you call EcoNet directly via their modems in San Francisco or Menlo Park, there is no extra charge from EcoNet. This is also true if you access EcoNet through the Internet, although in that case you’ll have to be paying someone else for an Internet connection anyway. Let’s assume, though, that you don’t live in San Francisco and that you don’t have an Internet connection already. If you live in Washington, DC, Baltimore, New York City, New Jersey, Boston, Portland, or Eugene, Oregon, you can gain access for $1 an hour. Do you live in one of those places? I don’t, but if you do, then that’s an extra $3.50 per month to access EcoNet for a grand total of $16 per
month. As for myself, I live in Missoula, Montana (not one of the places listed above). If I limit myself to 2400 baud (a very slow modem speed) and only use EcoNet in the evenings and on weekends, I can get away with an extra $2 per hour, or a grand total of $19.50 per month.

Actually, in real life, I’m a student at the University of Montana which means I get free (if you don’t count my tuition, that is) access to the Internet. Many students across the country have this type of access, and EcoNet has discounted prices for students to take advantage of this. Now, $19.50 seems pretty reasonable, but remember that this is just for some quick-and-dirty e-mailing. Using any on-line databases on a regular basis, or poking around the Internet in general, will entail spending much more time on-line. For those wanting this type of service, EcoNet is probably a poor choice, since spending thirty hours on-line each month will cost an EcoNet user close to $100 a month.

So, what’s the take-home message here? A service like EcoNet can be a wonderful resource for environmental activists, but the costs can be prohibitive depending on how it is used and where it is used from. If you are in San Francisco, EcoNet is the obvious choice no matter how you use it. If not, and if you plan on spending much time on-line, you’re probably better off subscribing to a generic Internet service provider. It must be remembered, though, that EcoNet is a service. EcoNet gives you access to the Internet, but it also gives you a lot more—databases, unique conferences, etc. You won’t get these by subscribing to a generic Internet provider, but then again, you can normally get unlimited usage for about $20 a month.
And, once you’re connected to the Internet, you will have access to some of EcoNet’s resource via IGC’s gopher.

**Using It**

Once an organization gets on-line it’s important that they make good use of this resource. The environmental organizations I interviewed use their on-line access for e-mail, getting information, and disseminating information. E-mail is the single most common use of CMC, and many of these organizations chose to go on-line for this cheap and fast means of communication. Only about half of the organizations checked their e-mail regularly enough for it to be considered a major means of communication for them.

Getting information from on-line sources is a very common activity among the environmentalists I interviewed, although a complaint I heard often is that the information is too disorganized and hard to find on-line. Another comment was that the information on-line would become much more useful once more organizations get on-line. This has the potential of a catch-22 situation, but it seems like many organizations are going on-line today anyway. And, as more do, the potential for sharing information becomes greater. For a grassroots organization, however, the most useful information can usually be found locally, in on-line legislative databases. As community-access CMC systems get more popular, as evidenced by the growth of the FreeNets, there will be much more of this type of information on-line.

In some ways getting information and disseminating information are flip sides of the same coin. After all, one person’s disseminated information is often very useful
to someone else. There are many ways to disseminate information on the Internet, and some are more complex than others. The simplest way is to simply create a list of e-mail addresses that you want to send an alert out to. Important messages can be broadcast to everyone on the list, all at once, at very little cost. This type of network can also be used through faxes, as one of the organizations I interviewed does, although e-mail is certainly cheaper.

The e-mail method is good for a small list of people you know, but sometimes you might want to announce something publicly. The easiest way to do this is by posting messages to appropriate newsgroups. For example, the Environmental Research Foundation (ERF) regularly posts their *Rachel's Environment & Health Weekly* on Internet newsgroups and also on EcoNet. Women's Voices for the Earth (WVE) recently used newsgroups on the Internet and EcoNet to publicize one of their upcoming conferences. It was very inexpensive to do, took very little time, and was quick to generate interest from the on-line community.

EcoNet and many Internet service providers allow you to set up mailing lists to distribute information to people who subscribe to them. This is similar to setting up a mailing list except that people can subscribe and unsubscribe themselves at will. *Rachel's* is also distributed this way, which gives people a choice on how they want to access it. Another example would be the EnviroLink mailing list which is distributed to over 400,000 people in 93 countries, and is sponsored by the EnviroLink Network.

You can also use a gopher service or the Web to create a place on the Internet where people can go to find out more information about what you do. Many
organizations are starting to do this, either putting their information on a site that someone else operates or creating their own. As an example of the former, many environmental organizations have information about themselves listed on the EcoNet gopher. Figure 9 lists some organizations that have their own Web sites, along with their addresses. Although setting up a gopher or a Web site does take some effort, it does allow you to reach a very large audience, and the Web allows images and sound as well.

Now that I've highlighted the ways in which an environmental organization could use the Internet for their benefit, let me talk about why it might not be that easy for some. None of the organizations I interviewed were doing more than posting occasional alerts on newsgroups or subscribing to a mailing list. One of the problems in many organizations is that once they get Internet access, or subscribe to some on-line service, they don't use it as constructively as they could. One of the reasons for this is that people in the organization may not feel like they have the time to devote to learning how to use e-mail and other electronic tools. Half of the organizations I interviewed have this problem. In many organizations that have a limited number of staff, this can be a real problem, and can prevent the organizations from getting on-line in the first place. How can a small grassroots organization justify the time needed to get on-line effectively when they feel that they barely have enough staff and time to devote to their current projects?
Figure 9: Sample Environmental Web Sites

Justifying any new undertaking has to be a decision that the organization, as a whole, comes to. It’s simply a matter of comparing the costs and the benefits of getting on-line. Can the organization afford to get on-line? How would the organization’s objectives be furthered by connecting to the Internet? None of the organizations I talked to saw cost as a real barrier, but I do know of some instances when just buying a computer can be problem. As far as furthering an organization’s objectives goes, all of the organizations said that CMC helped them a great deal.

It is obviously important not to underestimate the usefulness of the Internet, but it’s also necessary not to underestimate the Internet’s ability to monopolize people’s time. The Internet, as I’ve already described, gives powerful communications, and data retrieval ability at a relatively low cost. However, it can also swallow people’s time as they “surf” the Internet, looking for interesting and useful information. An
informed decision is the best one, and to this end an environmental organization wishing to go on-line should seek out other environmental organizations that are already on-line. See how they manage it, and how they evaluated different options in getting on-line.

The worst thing to happen would be for an organization to get access to the Internet, and then just not use it. You would think this wouldn’t happen, since people tend to value what they pay for, but it actually does happen often. For example, about 25% of IGC subscribers never use their account in a typical month. Sometimes, at the time the decision to go on-line is made, one person in the organization stands out as the proponent of the idea. This person is then counted on to handle everything related to using the Internet, from e-mail to information retrieval. But, what happens if this person leaves? In many instances, unfortunately, the Internet potential is left idle.

At other times, the organization may underestimate the time and resource commitment needed to go on-line, and then let it fall into disuse afterwards. If an environmental organization decides to go on-line, then the biggest mistake is going in with one foot dragging behind. It is important that electronic communication is embraced by everyone in the organization, and that everyone at least makes an effort to learn how to use it. This goes especially for the people in the top positions of the organization, because if they are motivated, then the people under them will likely be motivated as well. People in charge of an organization tend to be there longer too, so they can impart their Internet knowledge and motivation onto incoming staff members.
This ensures that once the “Internet person,” or “EcoNet person” leaves, they don’t leave a cyber-vacuum.

All the organization I talked to in Missoula are “on the edge” in this regard. They loom precariously close to a cyber-vacuum. The surest way to avoid this cyber-vacuum syndrome, besides the general suggestions already mentioned, is to institutionalize CMC in an organization. The Internet shouldn’t only be mentioned in connection with the latest e-mail received. For an environmental organization just beginning to use the Internet, this access should be a topic of conversation in its own right. What use can be made of Internet access? Is our Internet address on our letterhead and business cards? At the same time, however, using the Internet must be considered just a tool, not an end in its own right. Ultimately, the Internet needs to be used as just one more communications tool, albeit a powerful one, in the range of tools available to an environmental activist.

The key thing in all of this is to generate some momentum in the use and appreciation for the Internet. Although it may seem like an arduous chore at first, the time taken for everyone in an organization to become familiar with electronic communications is a very sound investment.
The Future of the Internet

"If you want to understand a new technology, ask yourself how it would be used in the hands of the criminal, the policeman, and the politician."—William Gibson

The National Information Infrastructure

I’ve already discussed some of the practical reasons why an environmental organization would want to make the move onto the Internet, either through a service like EcoNet or otherwise. When I say practical, I mean in terms of the direct advantages an organization might get by being on-line—getting information, disseminating information, cheap communications, etc. But there’s another, more urgent reason, for progressive organizations to get on-line. Without greater participation on the part of people working for social change, the future of the Internet could be grim. And the benefits we take for granted today might be gone tomorrow.

There is a vision for the new, improved Internet, namely the National Information Infrastructure (NII) proposed by the Clinton Administration. On September 15th, 1993, the National Telecommunications and Information Administration (NTIA) released a report entitled The National Information Infrastructure: Agenda for Action. This report outlines the general goals and principles for the NII, which has since become known as the “information superhighway.” The implementation of the Agenda is being left to the Information Infrastructure Task Force (IITF), a group formed by the Administration for just that purpose.

Most of the groups I interviewed didn’t know what the NII was, although most had heard of the information superhighway. It’s important, however, to cut through some of the rhetoric surrounding this, and look at what’s really happening. The
Clinton Administration is pushing the NII in a major way, claiming that it will work technological miracles on our society. The Executive Summary of the NTIA report says that:

The benefits of the NII for the nation are immense. An advanced information infrastructure will enable U.S. firms to compete and win in the global economy, generating good jobs for the American people and economic growth for the nation. As importantly, the NII can transform the lives of the American people—ameliorating the constraints of geography, disability, and economic status—giving all Americans a fair opportunity to go as far as their talents and ambitions will take them.

Of course, this all sounds dangerously familiar. The standard rhetoric about “jobs” usually translates into more profits for multinational corporations, and the American dream, referenced at the end, is wearing just a tad thin. Still, everyone agrees that the NII has enormous potential to change our lives, although not everyone agrees on what these changes should be, and indeed what they can be. That “as importantly,” phrase sounds a bit stale to me, too, and I’m not the only one worried that furthering democratic ideals in this country isn’t exactly the Administration’s top priority.

Some Concerns Over the NII

One of the groups concerned with these issues is the Electronic Privacy Information Center (EPIC) in Washington, DC. EPIC was established in 1994 to focus public attention on emerging privacy issues relating to the NII, and is sponsored by the Fund for Constitutional Government (FCG) and Computer Professionals for Social Responsibility (CPSR). CPSR itself, founded in 1981 by a group of computer scientists concerned about the use of computers in nuclear weapon systems, works to
direct public attention to critical choices concerning the applications of information
technology and how those choices affect society.

The first area of potential trouble is in the designing of the NII itself. In a recent report on the status of the NII, CPSR raised the following concerns:

- The NII may fail to provide universal access.
- A small number of companies may dominate the network and exert undue influence on its design and operation.
- There is a danger that carriers will control content on the NII.
- NII services may emphasize commerce at the expense of communication.
- Public access to government information may be restricted.
- The NII may fail to protect individual privacy.

Without universal access, our information society will be divided into the information have and have-nots. It might seem silly to worry about information equity when we still are horribly behind in dealing with economic equity in our society, but it's pretty clear that a deficiency in the former will only make the latter worse. Now, anyone talking about the development of the NII will at least give universal access lip service, but it will require much effort to actually achieve. Not only must everyone have affordable access to the NII, but they must also know how to use it. Knowing how to use it, in turn, depends on making it easy to use and providing training to those who need it.

But access isn't just being able to turn on a computer and see information flowing across a screen. There are different kinds of access, ranging from e-mail to video conferencing. Ultimately, everyone should have access to the full range of features available on the NII, but conventional wisdom seems to dictate that "high-end" features, like video conferencing, are services that need to be in place now for "high-
end” type of people, while more basic services are what we need to focus on for people that just want any kind of access. Of course, these are all economic decisions, motivated, at least in part, by greed and profit. But if corporate executives want to feel special by having access to high-tech features, so be it. The concern here is that the resources devoted to these pursuits might take some of the wind out of the sails of those who are trying to ensure universal access.

So who is making the decisions on where the resources go and who has access to what? In most industries today we can see how a small number of companies can come to establish a virtual monopoly. There is a real danger that a small number of companies may come to dominate the NII network. If this were to happen, public-interest concerns might logically fall by the wayside, to be replaced by purely profit-driven motives. For example, it’s actually quite likely that redlining will take place, where poor neighborhoods will be passed up by the new network, because they won’t offer the prospect of good returns on the initial investment.

One of the things that makes the future of the NII attractive is the idea that many different viewpoints may be expressed on the network and be accessible by everyone. There is a danger that carriers (that provide access to the network) will seek to control the content of the medium as well. This isn’t happening currently, but it’s likely if only a handful of corporations eventually wind up being the carriers for the NII. Especially important is to limit the ability of corporations to act as carriers for the network and as information providers at the same time. And as CPSR puts it,

The economic history of the United States provides convincing evidence that it is difficult to provide an equitable marketplace for content providers when single companies are allowed to control both carrier and content.
There are other dangers to content as well, though it still boils down to carriers controlling what is sent across the network. On February 2nd, Senator Jim Exon (D-NE) introduced S.314, the Communications Decency Act of 1995, in the United States Senate. This bill is an effort to eradicate digital pornography by making all telecommunications providers liable for the content of anything sent through their networks. This would have the effect of making such providers police their own networks, censoring messages in an attempt to avoid liability from messages deemed "obscene, lewd, lascivious, filthy, or indecent." A carrier that transmits such information could face up to two years in jail and tens of thousands of dollars in fines. The upshot of all of this is that freedom of speech and privacy would be sacrificed on the NII.

One of the most valuable uses for information networks today seems to be communication between users. However, some of the designers of the NII are business people who are hypnotized by the prospects offered by thousands of electronic consumers—they want electronic malls, video on demand services, etc. As valuable as those services might be to some, they can't be what drives the design of the NII. It should be recognized that communication is the first priority, and selling information is secondary.

Speaking of selling information, many government agencies have taken to selling information to private companies. It would certainly be ironic if the public were opened up to all the information on the NII at the same time that public information has been priced out of the range of the typical citizen. Charles White, in
"Information Technology and the Informed Citizen: New Challenges for the Government and Libraries," has this to say:

The federal government spends in excess of $6 billion on information dissemination (OTA, 1988). In an era of budgetary reductions, and the likely expansion of electronic information products, how much can the government afford to pay for dissemination, and how much will it transfer to commercial database vendors? Will such a transfer mean relatively high user access fees, the elimination of low-profit databases that serve only specialized needs, copyright and similar controls over the public information such vendors sell, undue self-interested influence over the delivery of public information, and the concentration of information delivery services in a limited number of commercial vendors?

One of the more exciting features of the NII, in my opinion, is the public’s access to more government information and their ability to communicate their ideas more effectively to government. Given the large increase in public apathy toward the political process, this aspect of the NII should be given top priority—and it would if the political forces in our country truly believed the rhetoric concerning our democracy.

**Issues of Privacy**

In addition to all the concerns over access and content, the future of our privacy is also of paramount importance. Four of the six organizations I interviewed expressed concern over the security of transmitted messages, and would not feel safe sending confidential material by e-mail. For CMC to be effective as a means of communication, privacy must be assured. Computers, in general, have threatened to erode our privacy a great deal, and computer networks need to be monitored very carefully in this respect. According to CPSR,

Using the NII, government agencies and private companies would have unprecedented opportunities to gather and disseminate information about individuals. If no protections are built into the infrastructure to guard against abuse, such data collection threatens to erode the rights of citizens. Similarly, if the network itself does not protect the privacy of its users, they will be unable to communicate freely.
The government recently launched two initiatives, both an attack on people’s privacy, that directly affect the development of the NII. The first of these is the Clipper chip, announced by the government in February, 1994.

Before I talk about Clipper, though, I need to describe encryption. Without getting into too much technical detail, encryption is a method by which data can be encoded into a secret form that only someone with the proper “key” can decode and read. Without the proper key, the data remains a meaningless jumble. The data to be encrypted can be the text of an e-mail message, a graphic image, a computer program, and just about anything that can be transmitted electronically. Any code, of course, can theoretically be broken, but advances in cryptographic science have devised encryption schemes that are virtually impossible to break.

The FBI and the National Security Agency (NSA, a super-secret military intelligence agency responsible for intercepting foreign government communications and breaking the codes that protect such transmissions) both have their reasons to fear the spreading of technology that would enable anyone to easily encrypt messages that they don’t have the ability to decrypt and read. The standard reason they give is that this ability would be used by criminals, terrorists, and other bad guys to send secret messages that could not be deciphered. Wire-tapping would become meaningless, because conversations (through special phone equipment) and computer data, even if intercepted, would be meaningless without the proper keys.

Because of the implications for how the FBI and the NSA conduct their business, they have been the primary advocates of the Clipper system, technically
specified as the “Escrowed Encryption Standard.” It consists of an encryption method (called Skipjack) devised by the NSA, and the outlines of a key-escrow system to be used with the chip. The Clipper chip itself is used to encrypt voice transmissions, while an analogous chip, Capstone, would be used to encrypt computer data. Government “escrow agents” would hold the keys to every chip so that law enforcement agencies could be ensured access to any encrypted messages that were created by those chips.

What this all boils down to is that the government is trying to entrench an encryption standard that they have a back door into. A corollary to this is that the government certainly does not want an encryption standard to spread that they don’t have a way into. The White House still fully supports this effort and is committed to making the Clipper chip a federal standard for voice networks. AT&T, one of the few voices in industry to support Clipper, is busily producing telephone equipment containing Clipper technology for government use. Over 10,000 Clipper-equipped telephone units have already been purchased by the law enforcement community. If the Clipper chip continues to be the government standard, it could force all those who need to access government data to also use the Clipper chip. This “voluntary” standard is being marketed very aggressively indeed.

But there are other methods of encryption that exist besides Clipper. In 1991, Phil Zimmermann created a program called Pretty Good Privacy (PGP) to encrypt messages, and published it as free software. He summarized his reasons for releasing it as follows:
...In the Information Age, cryptography affects the power relationship between government and its people. The Government knows this all too well, as evidenced by their recent policy initiatives for the Clipper chip, which would give the Government a back door into all our private communications—an Orwellian "wiretap chip" built into all our telephones, fax machines and computer networks. PGP strikes a blow against such dark trends, and has become a crystal nucleus for the growth of the Crypto Revolution, a new political movement for privacy and civil liberties in the Information Age. This government has done all they can to stop the emergence of a worldwide encryption standard that they don't have a back door into. And that same government has placed me under criminal investigation for unleashing this free software on the world. If indicted and convicted, I would face 41 to 51 months in a federal prison.

Clearly, this is no trifling matter for the powers that be, but Zimmermann goes on to say that despite government pressure, PGP has become the most widely used software in the world for e-mail encryption. The government's current ban on the export of cryptography technology is what lies behind Zimmermann's prosecution, since PGP has made appearances all over the world (even though Zimmermann claims that he had no connection with its overseas distribution).

As if pushing the Clipper chip and discouraging other, more secure, means of encryption wasn't enough, the FBI has also pushed its "Wiretap Bill" through congress. This bill requires that every carrier, from small BBS's that charge fees to large services like America Online and Prodigy, must ensure that its equipment allow for interception of a communication concurrent with a transmission and provide call identifying information to a remote government facility. The court could impose civil fines of up to $10,000 per day for non-compliance. To pay for the mandated re-designs, the bill authorizes $500,000,000 for fiscal years 1995 through 1998. EPIC highlights the dangerous precedent that the bill sets:

...the pending bill represents a fundamental change in the law's approach to electronic surveillance and police powers generally. The legislation would, for the first time, mandate that our means of communications must be designed to facilitate government interception.
Lest you think this is all some strange Orwellian scheme that can't see the light of day, the FBI has already started to implement it. According to a recent report by EPIC, the FBI, on February 23, issued a Federal Register Notice on the “Implementation of the Communications Assistance for Law Enforcement Act.”

According to the notice, there is now a Telecommunications Industry Liaison Unit in the Engineering Section, Information Resources Division of the FBI to work with industry on the implementation of the new wiretap compliance requirements.

The FBI is expected to publish estimated wiretap capacity requirements in the Federal Register by October 28, 1995. Carriers will then have three years to redesign the nation's phone system so that all networks have the capability to:

- Isolate a particular electronic communication
- Isolate call-identifying information
- Deliver intercepted information to a remote government monitoring location
- Deliver information to the government without disclosing the government's activity

Now, I think it should be clear that this new digital telephony law represents a dangerous erosion of our privacy. The FBI has a long history of domestic surveillance, but the current initiatives go far beyond what's been done in the past. They're setting legal precedents by asserting that private companies and individuals must work to facilitate government surveillance. Marc Rotenberg, director of CPSR and an adjunct professor at Georgetown University Law Center, had the following to say about Clipper, and it could also be said of the new digital telephony law:

...currently there is no legal basis—in statute, the Constitution or anywhere else—that supports the premise which underlies the Clipper proposal. As the law currently stands, surveillance is not a design goal. General Motors would have a stronger legal basis for building cars that could go no faster than 65 miles per hour than AT&T does in marketing a commercial telephone that has a built-in wiretap capability.
The digital telephony law also bodes ill for the future of cryptography, and it strengthens the case against the Clipper chip. After all, what good is a wiretap if all you get is information encrypted and virtually unbreakable? FBI director, Louis Freeh, has the answer: “Powerful encryption threatens to make worthless the access assured by the new digital [telephony] law.” This is a statement he made before the Senate Judiciary Committee on February 14th, 1995. He’s also hinted at the idea of prohibiting all types of cryptography except Clipper if powerful encryption does indeed get in the way of wiretapping.

Yes, there are certainly many roadblocks being erected, standing in the way of a truly amazing communications revolution. The Internet is the closest thing we have today to the NII—we can learn much by studying it, but its future is in jeopardy. All the attacks on our privacy and freedoms that I’ve mentioned threaten to undo many of the previous successes of the Internet. Many people consider the Internet to be a very useful tool in their everyday lives, and, it at least some respects, it can be used as a model for a democratic, not an oppressive, new medium.
To Be Continued...

“More than any other time in history, mankind faces a crossroads. One path leads to despair and utter hopelessness. The other, to total extinction. Let us pray we have the wisdom to choose correctly.”—Woody Allen, “My Speech to the Graduates”

We do stand at a crossroads, and we just might have a better future to look forward to, a future that we can have a hand in shaping. I’ve looked at what makes the Internet important, and I discussed the future of the Internet. We know what some people are planning for the Internet (or the NII), and we can use this knowledge to shape a future that we’d like instead. The future of CMC can be filled with electronic shopping malls, or it can be a place where progressive ideas can be shared with everyone.

Environmental organizations have a great deal to gain from a free Internet. An Internet that everyone has access to, and one in which people can communicate freely and with privacy. Many environmental organizations, even small ones, are already aware of the benefits to be had in going on-line, but it is necessary to understand that these benefits are not at all guaranteed. By going on-line, however, environmental organizations make themselves part of a growing CMC community. This is the first step in gaining some insight in what’s at stake in the future of the Internet, and being able to do something about it.

One example of the exciting possibilities that the Internet offers us comes from my own experience in getting information through it. On February 9th, 1995, President Ernesto Zedillo ordered the Mexican army to capture Zapatista rebel leader Subcomandante Marcos. As a result of the army’s efforts to take over “Zapatista” towns, thousands of villagers fled their villages into the Lacandon jungle. In the
months that followed, human rights abuses where documented by groups such as Amnesty International, and the jungle itself was in danger of being harmed.

Throughout all of this, the mainstream media in the US was disturbingly silent. Nothing was said about the plight of the Indians in the jungles. Nothing was said about the condition in which the Mexican army left the villages, homes destroyed and food stuffs ruined. Nothing was said about the lack of food and shelter in the jungle that left many of the refugees weak and sick, including many children and pregnant women. Just about the only news about Mexico to be seen were the stories about Mexico’s economic crisis and the US aid package concocted to deal with it.

With the news blackout in full swing, it was very hard to get information on what was going on in Mexico, but those of us who were most concerned did manage to find out what was going on. We received reports every day from the Associated Press and Reuters. We received stories from Mexican newspapers like La Jornada. We read first-hand accounts of the plight of the Indians. We received communications directly from Subcomandante Marcos. We even had transcripts of Voice of America radio programs covering the situation in Mexico. All of this information reached us via the Internet.

If it was not for the Internet, we would have been much less well informed. I received many pages worth of information every day in the form of e-mail. The situation in Mexico was also discussed on a few Internet newsgroups, and alerts were posted to PeaceNet conferences. As a result of some of the action appeals that went out over the Internet, people faxed President Zedillo asking him for a peaceful
resolution to the conflict and for the withdrawal of the Mexican army. His office received so many faxes that the fax machine had to be shut down.

This example highlights the tremendous potential of the Internet. Unfortunately, this example did not go unnoticed by other concerned parties. In the middle of all this action, the Washington Post ran an article claiming that the Internet had to be better controlled lest “liberal” forces exploit it for propaganda purposes. Given the current Administration’s drive to control security on the Internet, perhaps that warning didn’t fall on deaf ears. The ability of the Internet to foster this type of information sharing can be expected from such a widely distributed CMC system, but that isn’t to say that such a system can’t be turned into something less-than-ideal.

Based on the survey I conducted, and on my general observations, many environmentalists understand the utility of the Internet, but not many understand the threats to this medium. There are two reasons, however, why we should be concerned about these threats. First of all, the freedom to communicate on the Internet is what makes it useful. Second, implementing a CMC system that genuinely informs people and encourages them in democratic practices is something that can only be seen as a positive development for the environmental movement as a whole.

Fortunately, there are already initiatives taking place that can help make the future of the Internet bright. Organizations like the Electronic Frontiers Foundation and Computer Professionals for Social Responsibility have taken a keen interest in the development of the Internet. In particular, they want CMC to be used to empower people, and not simply to increase the pace of our consumer society. Both of these
organizations have focused on discussing the implications of the National Information Infrastructure, and on privacy rights in the information age.

As far as universal access is concerned, there is vast room for improvement in the area of public library involvement, and there are people working on that. Community-based systems, such as the FreeNets, are an attractive alternative to large national services that might not have the incentive to offer service to everyone. FreeNets also help keep people acting locally, giving them access to local information.

Dr. Tom Grundner is spearheading the effort to make FreeNets the standard way of accessing the Internet.

On April 17th, 1995, the Cyberspace Society was launched. Part of the charter for this society reads thus:

For the most part, people get their reading of these events through the corporate-dominated media. The larger pattern of events is intentionally concealed by this media, whose owners tend to be the same corporate forces engineering the changes. Internet provides a unique vehicle for "going around" the mass media and providing for ourselves an independent means of sharing information and views. Unfortunately, the democratic openness of Internet itself is also under attack by these same forces, who seem determined to restrict freedom of expression on Internet, and replace the participatory Internet culture with yet another corporate-controlled, commercialized, mass-media channel.

The society plans on working to prevent this from happening by organizing the people on the Internet into a political force. Only time will tell if they are to be successful.

So, there is hope to be found in Cyberspace. In the end, we don’t have to accept computer technology as it’s handed to us. Rather, we have an obligation to make sure that such technology is used for the benefit of our society, and not to its detriment. This holds especially now, when such a new and potentially useful medium
such as the Internet is in its early stages. The many-to-many nature of the Internet holds the promise of more democratic communication in our society, but only if everyone has access to it, and if the communications on the Internet are allowed to be open and free. Environmental organizations, representing progressive forces in our society, should have a role in all of this, and the first step is the colonization of the Internet. The next step is developing a better understanding of the threats to the Internet so that we can do something about it.

For many organizations, cost does not seem to be the major factor determining whether they go on-line, but commitment of time and other resources is. Organizations such as IGC have played a major role in getting progressive organizations on-line, and as more environmental organizations move on-line, it will become more attractive for others to do so. In the Northwest, for example, the Brainerd and Bullitt Foundations are funding "an online communications project that allows the environmental community to work more productively, collaboratively, and cost-effectively." They plan to have at least 3,000 activists in the Northwest on-line by 1998.

Eventually, the time will come when a service such as e-mail will become a standard means of communication. Eventually, the Internet will be looked at as just another tool that activists can make use of to whatever they happen to be doing. We're living in a time of transition, between the awkward first steps into CMC and whatever the future may hold. As confusing as this time may be, it's vitally important to forge ahead and stake a claim to the Internet. Unless we do so, our future might be just handed to us, and we might not like what we receive.
Appendix A: Internet Environmental Resources

What follows is a list of environmental resources of note on the Internet. A thorough test has not been done on each one, so no guarantees are made on the quality of information. If you need information on how to get on-line and how to use on-line resources, there are scores of books dedicated to just that topic. Two excellent examples of this genre that come to mind are Richard Wiggin’s *The Internet for Everyone*, and Ed Krol’s *The Whole Internet*.

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| Name: Campaign for Peace and Democracy | Type: Gopher        | URL: gopher://gopher.igc.apc.org |
| Name: Cardiff Earth First!         | Type: World Wide Web    | URL: http://www.cm.cf.ac.uk |
| Name: Center for Aquatic Ecology   | Type: World Wide Web    | URL: http://denrl.igis.uiuc.edu |
| Name: Center for Biodiversity      | Type: World Wide Web    | URL: http://denrl.igis.uiuc.edu |
| Name: Center for Ecological Health Research | Type: World Wide Web | URL: http://ice.ucdavis.edu |
| Name: Center for Economic Entomology | Type: World Wide Web   | URL: http://denrl.igis.uiuc.edu |
| Name: Center for Global Regional Environmental Research | Type: World Wide Web | URL: http://www.cgrer.uiowa.edu/ |
| Name: Center for Third World Organizing | Type: Gopher          | URL: gopher://gopher.igc.apc.org |
| Name: CLEAN                        | Type: Gopher            | URL: gopher://envirolink.org |
| Name: Cooperative Institute for Research in Environmental Sciences | Type: World Wide Web | URL: http://cires.colorado.edu |
| Name: Center for Policy Alternatives | Type: Gopher            | URL: gopher://gopher.crest.org |
| Name: Center for Renewable Energy and Sustainable Technology | Type: World Wide Web | URL: http://solstice.crest.org |
Name: Center for Wildlife Ecology
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Name: Conflict Resolution Center, International
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Name: Conservation Volunteers of Northern Ireland
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Name: EarthWatch
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Name: EcoNet
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Name: EcoTrust
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URL: http://www.well.com

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Name: Environmental Hazards Management Institute
Type: World Wide Web
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Name: Environmental Health Center- Nat. Safety Council
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Name: Environmental Protection Agency (EPA)
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URL: http://www.epa.gov

Name: Environmental Research Foundation
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URL: gopher://ftp.std.com

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URL: http://www.erim.org

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<td>Type: World Wide Web</td>
<td>URL: <a href="http://www.sierraclub.org">http://www.sierraclub.org</a></td>
</tr>
<tr>
<td>Name: Sierra Student Coalition</td>
<td>Type: World Wide Web</td>
<td>URL: <a href="http://ssc.org">http://ssc.org</a></td>
</tr>
<tr>
<td>Name: Student Environmental Action Coalition</td>
<td>Type: Gopher</td>
<td>URL: gopher://ecosys.drdr.virginia.edu</td>
</tr>
<tr>
<td>Name: Students for Environmental and Ecological Diversity</td>
<td>Type: World Wide Web</td>
<td>URL: <a href="http://pubweb.acns.nwu.edu">http://pubweb.acns.nwu.edu</a></td>
</tr>
<tr>
<td>Name: Suisim Marsh Natural History Association</td>
<td>Type: World Wide Web</td>
<td>URL: <a href="http://community.net">http://community.net</a></td>
</tr>
<tr>
<td>Name: TAGER</td>
<td>Type: World Wide Web</td>
<td>URL: <a href="http://www.chattanooga.net">http://www.chattanooga.net</a></td>
</tr>
<tr>
<td>Name: Taiga Rescue Network</td>
<td>Type: Gopher</td>
<td>URL: gopher://gopher.igc.apc.org</td>
</tr>
<tr>
<td>Name: Tellus Institute for Resource and Environmental Strategies</td>
<td>Type: World Wide Web</td>
<td>URL: <a href="http://www.channel1.com">http://www.channel1.com</a></td>
</tr>
<tr>
<td>Name: The Center for Civic Networking (CCN)</td>
<td>Type: Gopher</td>
<td>URL: gopher://world.std.com</td>
</tr>
<tr>
<td>Name</td>
<td>Type</td>
<td>URL</td>
</tr>
<tr>
<td>-------------------------------------------</td>
<td>--------------</td>
<td>----------------------------</td>
</tr>
<tr>
<td>The Smithsonian</td>
<td>Gopher</td>
<td>gopher://envirolink.org</td>
</tr>
<tr>
<td>Sustainable Communities Network</td>
<td>World Wide Web</td>
<td><a href="http://www.cfn.cs.dal.ca">http://www.cfn.cs.dal.ca</a></td>
</tr>
<tr>
<td>The Together Foundation</td>
<td>Gopher</td>
<td>gopher://gopher.together.org</td>
</tr>
<tr>
<td>University Alliance to Protect James Bay</td>
<td>Gopher</td>
<td>gopher://envirolink.org</td>
</tr>
<tr>
<td>U.S. Institute of Peace</td>
<td>Gopher</td>
<td>gopher://gopher.igc.apc.org</td>
</tr>
<tr>
<td>Vegetarian Resource Group</td>
<td>Gopher</td>
<td>gopher://envirolink.org</td>
</tr>
<tr>
<td>Western Pennsylvania Conservancy</td>
<td>Gopher</td>
<td>gopher://envirolink.org</td>
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<tr>
<td>Wild Earth</td>
<td>Gopher</td>
<td>gopher://envirolink.org</td>
</tr>
<tr>
<td>Wilderness Society</td>
<td>World Wide Web</td>
<td><a href="http://town.hall.org">http://town.hall.org</a></td>
</tr>
<tr>
<td>World Conservation Monitoring Centre</td>
<td>World Wide Web</td>
<td><a href="http://www.wcmc.org.uk">http://www.wcmc.org.uk</a></td>
</tr>
<tr>
<td>World Watch</td>
<td>Gopher</td>
<td>gopher://envirolink.org</td>
</tr>
<tr>
<td>Women of Color Resource Center</td>
<td>Gopher</td>
<td>gopher://gopher.igc.apc.org</td>
</tr>
<tr>
<td>World Heritage</td>
<td>Gopher</td>
<td>gopher://hpb.hwc.ca</td>
</tr>
<tr>
<td>Zero Population Growth</td>
<td>Gopher</td>
<td>gopher://envirolink.org</td>
</tr>
</tbody>
</table>
Appendix B: The Survey

I would like to thank the following organizations and individuals for taking the time to participate in the survey.

Alliance for the Wild Rockies
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E-mail: bryony@selway.umt.edu

The questions that were asked as part of the survey are listed on the following pages, followed by the range of answers received. The survey was meant to be anonymous, so there is not intended to be any indication as to which organizations gave which responses. If any more information is needed regarding the survey, please contact the author.
1) Does your organization use computer networks? For example, the Internet, EcoNet, America Online, CompuServe. What factors were involved in the decision to go, or not to go, on-line?

• Yes, EcoNet. E-mail will become a standard means of communication and it’s simply more productive to make us it.

• Yes, EcoNet. Very cost effective to do outreach

• Yes, organization’s internal network and an employee’s personal account on WestNet and America Online.

• Yes, employee’s personal Internet account, and we also make use of a local legislative network. It’s a quick way to get information.

• Yes, employee’s personal Internet account and a private fax network. It cuts down on paper use, it’s inexpensive and fast, and the opposition is very effective at using this technology.

• Yes, EcoNet. It’s easy to communicate via e-mail.

2) If you are on-line, how do you use the access that you have? How much does it cost you? How often do you use it? What is the limiting factor in how often you use it? Is it useful for your work? How many people use computer networks in your organization?

• Communication between chapters, receiving messages, subscribing to mailing lists, alerts will be distributed this way in the future. Cost is about $12.50 per month. It is used about an hour a month. The limiting factor is need. Cost isn’t a factor, because e-mail is the cheapest way to communicate. It is very useful. Only one, perhaps two, people use it.

• Distribution of press releases and action alerts, e-mail. Cost is about $15 to $20 per month. Information distribution, about once a month; check e-mail about once a week; send e-mail about once a month. The limiting factor is time, we need to hire a person to do this, but we don’t have the funds. It is useful for our work. Only one person uses it.

• E-mail between people in coalition and other activists, disseminate information, action alerts, information exchange on mailing lists, distribute newsletter. No cost to use internal network, America Online is about $9.95 per month. It is used about twice per day. The limiting factor is the time needed to do other work. It is very useful, to the point of being “addicted to e-mail.” Only one person uses it.
• Getting information from various on-line sources. No cost for using employee’s Internet account, and no cost for local legislative information besides nominal phone charges. It is used about once every other week. The limiting factor in its use is need. It is useful. Only one, perhaps two, people use it.

• Correspondence with the board of directors and other activists, disseminating alerts and notices, broadcast faxing. No cost besides nominal phone charges. It is used every day. The limiting factor is that the line is sometimes too busy to get through. It is very useful. Only one person uses it.

• E-mail for quick notes, since long-distance communication this way is cheap. It costs about $15 or so per month. It is used about once per day to once every two days. The limiting factor is the use of the office computers for other business. It is useful for communication. About three people use it regularly.

3) If you are not on-line, are you considering going on-line in the future? If so, what will you be waiting for. If not, why?

• Not applicable.

• Not applicable.

• Not applicable.

• We are waiting for a recent grant to come through which will give us computers and fax modems. Then the organization will get its own EcoNet account.

• We are too busy right now to look into different options in going on-line, but it’s something we want to do.

• Not applicable.

4) What are your perceptions of the information available on-line?

• There’s not a lot of need for information on-line. Most of our information comes from snail-mail. It will become more useful as more organizations get on-line.

• We get legislative updates on bills. In general, some of the information seems worthless and is annoying to have to sift through. It’s especially annoying when you read an e-mail only to discover that you need to follow it up with a phone call anyway.
• There's a lot of information, but it's not very well organized so it's hard to find specific information. Legislative information is the most useful thing we get online.

• There an overwhelming quantity of information, but most it seems pretty good. We're generally excited to be able to information in this way, especially legislative updates. Some of the information out there, however, is very extraneous and can be a waste of time. It could be very confusing, unless the staff makes a commitment to learn how to use it effectively.

• We get good information on-line, especially from mailing lists.

• We mostly get GIS information on-line. We want to explore it more, but we are limited by time.

5) Do you have any concerns that computer networking may in some way be detrimental to your organization? If yes, how so?

• It could be abused by the staff, that is they could overuse it for personal reasons. Security is a possible worry too. Basically the same issues as with a telephone.

• No.

• Not really, although we wouldn't send confidential information by e-mail, because of the fear of security.

• No.

• We're worried about privacy—that our opposition might tap into our communications. Also, we don't want to get so wrapped up in e-mail that we lose touch with meeting real people at the grassroots level.

• Hopefully, it won't eat up people's time if they start using it like a television. If that happens, the phone bill might be a problem.

6) Do you know what the Clipper chip is? If yes, what are your feelings about it?

• Yes. The chip is a knee-jerk reaction by the government, symptomatic of their need for control. It's a good thing that the "hacker community" is taking a stand against it, and that many corporations don't like it either. I don't think it can succeed.

• No.
• Yes. I definitely mistrust the eavesdropping ability of this. It could be abused. I don’t know much about the debate.

• No.

• No.

• No.

7) Do you know what the National Information Infrastructure is? If yes, what are your feelings about it?

• Yes. It’s a vision that contains many unresolved concerns. It will probably be a long time before it becomes a reality. Will it become private?

• No.

• Yes. We should all be concerned about this, however the consequences need to be made more clear. There should be no information elite, so there needs to be very wide access to it. Buyers and sellers should not censor the content. Senator Exon’s bill is bad news.

• No.

• No.

• No.

8) Have you heard about the information superhighway? If yes, what are your feelings about it?

• Yes. It seems very large and vague. Perhaps it’s the “information revolution,” or “cyberspace.”

• Yes. It is too big and overwhelming. It’s exciting to think about the availability of information and of being connected to it all, but it is a potential Pandora’s Box. It could further isolate people from nature.

• Yes. Basically, it’s the NII.

• Yes. I have good feelings about it, but there’s a lot of rhetoric surrounding it, and it’s hard to understand all the implications involved. It could be a great equalizer, but it could also generate more power for big business.
• Yes. It could be a positive thing, but it's also very scary. It seems very technical and hard to tap into. The global scale of it could disempower people—it's better to empower people with local information. However, global communication is good when it allows people with the same problems to share information.

• Yes. It seems very idea-oriented and impractical. In general, though, it seems like the natural progression of technology. Ethical judgments of people are ultimately more important than the technology itself.

9) Do you know what cryptography is? Encryption? PGP?

• Yes. Yes. No. We don’t have much need for security here, but this is something that an organization like IGC should be concerned with.

• No. No. No.

• Yes. Yes. Yes. Phil Zimmermann is great, and PGP is an excellent way for people to use secure e-mail.

• No. No. No.

• No. No. No.

• No. No. No.

10) How many people work in your organization (full-time, part-time, and volunteers)? What is your budget?

• Two full-time, one part-time, and some volunteers in some chapters. About $100,000; one-third of which is membership.

• Five full-time (one intern and one position split between two people), one part-time, and about twenty volunteers. About $235,000.

• One full-time and about five volunteers. About $10,000.

• Three full-time, one part-time, and three or four volunteers. About $200,000; forty percent of which is membership.

• One full-time and about twenty volunteers. About $30,000.

• Eight part-time and twelve or so volunteers. About $450,000.
# Glossary

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
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<tbody>
<tr>
<td>APC</td>
<td>Association for Progressive Computing. An extensive global computer network dedicated specifically to serving non-governmental organizations and citizen activists working for social change.</td>
</tr>
<tr>
<td>backbone network</td>
<td>Used to refer to a central network to which many other networks are connected.</td>
</tr>
<tr>
<td>bandwidth</td>
<td>The capacity of a network. Network systems need higher bandwidth for audio or video than for e-mail services.</td>
</tr>
<tr>
<td>BBS</td>
<td>Bulletin Board System. A computer system that allows its users to send public and private messages to each other and often offer other services such as file transfer.</td>
</tr>
<tr>
<td>Capstone</td>
<td>The computer chip that would be used in implementing the Clipper system for data communications.</td>
</tr>
<tr>
<td>Clipper chip</td>
<td>The computer chip that would be used in implementing the Clipper system for voice communications.</td>
</tr>
<tr>
<td>Clipper system</td>
<td>The Escrowed Encryption Standard. A government-proposed encryption standard that would ensure law enforcement agency access to encrypted data.</td>
</tr>
<tr>
<td>CMC</td>
<td>Computer-Mediated Communication. A type of communication that takes place by sending information from one computer to another.</td>
</tr>
<tr>
<td>colonize</td>
<td>To migrate to and settle in.</td>
</tr>
<tr>
<td>CPSR</td>
<td>Computer Professionals for Social Responsibility. An organization founded in 1981 that works to direct public attention to critical choices concerning the applications of information technology and how those choices affect society.</td>
</tr>
<tr>
<td>e-mail</td>
<td>Abbreviation for electronic mail. A service that allows people to send electronic messages to each other. Many systems also allow a person to attach files to their message.</td>
</tr>
<tr>
<td>encrypt</td>
<td>To translate data into a coded form.</td>
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<tr>
<td>EPIC</td>
<td>Electronic Privacy Information Center. An organization established in 1994 to focus public attention on emerging privacy issues relating to the NII.</td>
</tr>
<tr>
<td>FidoNet</td>
<td>A network design that lets BBSs all over the world share messages with one another.</td>
</tr>
</tbody>
</table>
FreeNet: One of a number of community-oriented BBS's around the world. Many FreeNets are connected to the Internet.

FTP: File Transfer Protocol. The Internet service used to transfer files from one computer to another.

Gopher: The name of an Internet browsing service in which all information is organized into a hierarchy of menus.

home page: The initial page of information seen at a particular Web site.

HTTP: HyperText Transport Protocol. The protocol used to access a World Wide Web document. The term http is usually seen by a user in the URL.

hypertext: A system for storing pages of textual information that each contain embedded references to other pages of information.

IGC: Institute for Global Communications. An organization that operates four international computer networks: PeaceNet, EcoNet, ConflictNet, and LaborNet. IGC is committed to progressive social change.

information superhighway: Popular term used to refer to the emerging national information infrastructure in the United States. This term is sometimes used to refer to the Internet.

Internet: The world-wide network of networks that connects individuals, organizations, and government agencies all over the world, and acts as a single large network.

LISTSERV: A program that maintains a list of electronic mail addresses.

mailing list: An electronic mail address that includes a list of recipients.

many-to-many: A type of communications medium in which everyone in the system can communicate with everyone else in the system.

modem: A device used to transmit digital information from one computer to another using analog phone lines.

multimedia: A term describing any facility that can display text, graphics, images, and sounds.

NII: National Information Infrastructure. The emerging information infrastructure in the United States. The Internet is usually considered the first part of this.

netnews: Abbreviation for network news, the Internet distributed discussion list system.

news article: An individual message that appears on a netnews newsgroup.
<table>
<thead>
<tr>
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<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>newsgroup</td>
<td>One of the many topic-oriented message public message areas in netnews. A user can subscribe to whatever newsgroup s/he wants to.</td>
</tr>
<tr>
<td>one-to-many</td>
<td>A type of communications medium in which the receivers of information in a system cannot send anything back to the transmitters of that information.</td>
</tr>
<tr>
<td>PGP</td>
<td>Pretty Good Privacy. A computer program written by Phil Zimmermann that can encrypt messages sent by electronic mail so that only the sender and receiver can read the message.</td>
</tr>
<tr>
<td>protocol</td>
<td>The rules two or more computers must follow to exchange messages and data.</td>
</tr>
<tr>
<td>Internet service</td>
<td>Also provider. An organization that offers Internet access to individuals and organizations.</td>
</tr>
<tr>
<td>provider</td>
<td>Surfing the Internet: A phrase meaning to use Internet services to browse information.</td>
</tr>
<tr>
<td>sysop</td>
<td>System Operator. The manager of a BBS.</td>
</tr>
<tr>
<td>URL</td>
<td>Uniform Resource Locator. A unique name used by Web browsers to identify and fetch a given page of information on the Internet.</td>
</tr>
<tr>
<td>World Wide Web</td>
<td>Also WWW or Web. An Internet service that organizes information using multimedia. Each document can contain links to images, audio, or other documents.</td>
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</table>
Bibliography And Sources


