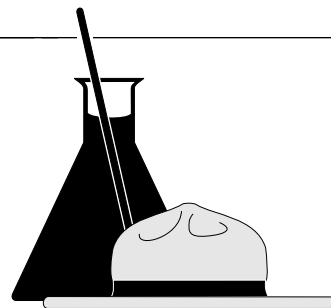


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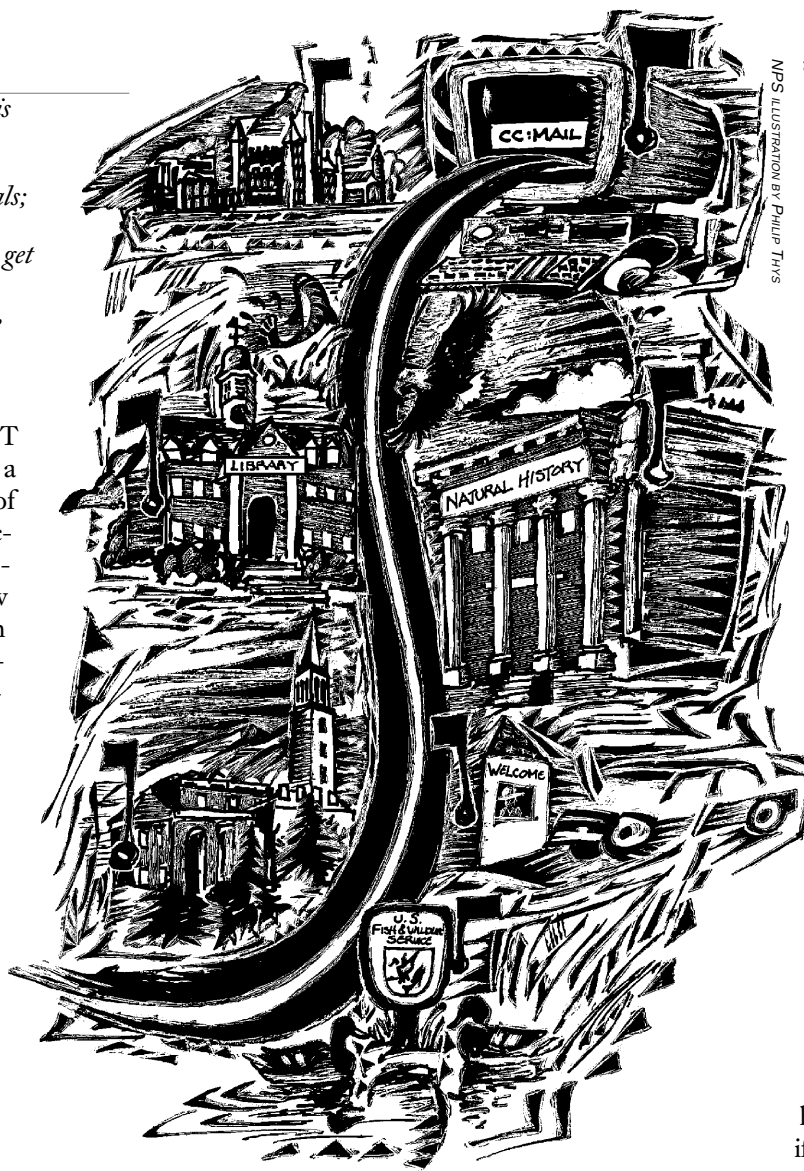
RETRIEVING BIOLOGICAL INFORMATION OVER THE INTERNET

A Primer for Resource Professionals Using cc:Mail

BY STEPHEN FETTIG

Editor's Note: This article is limited to examples for biologists, ecologists, and natural resource professionals; however, the same e-mail access routes can be used to get legal, law enforcement, geological, cultural resource, and other information over the Internet.

THE INTERNET has fast become a common part of our lives. Electronic mail (e-mail) addresses are now given out routinely in magazines and on television and radio shows allowing viewers and listeners to ask questions or send comments. Some program hosts and commercial enterprises even point computer users to multimedia World Wide Web pages—the newest and perhaps most popular way of exploring the Internet—for further information. Many state and federal government agencies also have Web pages (including the National Park Service),



The information superhighway is fast connecting land managers with universities, libraries, the Smithsonian Institution, and museums.

along with most universities and research centers around the world. Many of these Internet sites provide a great deal of interesting and useful biological information. While some NPS staff already have access to the World Wide Web and its multitude of biological resources, most park employees only have access to cc:Mail, the NPS e-mail software.

To many people it may come as a surprise that most Internet information is available to park personnel right now, with nothing more than our current cc:Mail system. Everyone with access to cc:Mail has access to the Internet. In reality, everyone with e-mail is already part of the Internet, although in a limited way (see side bar on page 16 explaining levels of connectivity). No new hardware, software, or computer equipment is needed to get information from computers from all over the world. Don't get your hopes up too high, however, if the only connection you have to the non-NPS world of com-

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puters is cc:Mail. If this is the case, many of the high-powered, fast, multimedia aspects of the Internet will not be available to you. But that is no reason to put off

(other Internet definitions can be found on page 17). He elaborates that a set of network conventions and common tools is employed to give the appearance of a single large network, although the linked computers actually use many different hardware and software platforms. With more than 3.5 million computers and

ACCESS TO INTERNET BY E-MAIL

Webmail and Gophermail are two ways you can retrieve information using only e-mail, the lowest level of Internet connectivity (see sidebar). Others, e.g., FTPmail, Finger, Archie, Veronica, Usenet, and Wais, will almost certainly be created in the future.

Even cc:Mail users can retrieve the text portions of Web pages by using a service known as Webmail.

acquiring useful job-related information and developing professional contacts over the Internet.

WHAT IS THE INTERNET?

Bob Rankin, author of *Accessing the Internet by e-mail: Dr. Bob's guide to offline Internet access*, defines the Internet as a sprawling collection of computer networks that spans the globe, connecting government, military, educational, and commercial institutions and private citizens to a wide range of computer services

40,000 computer networks, the Internet (Net for short) was born of an experiment in postnuclear war command communications by the U.S. Department of Defense in the 1970s. The effort eventually grew to include the National Science Foundation and several universities and advanced from there.

UNIFORM RESOURCE LOCATORS

To get information over the Internet you need to know the computer and directory in which the information resides.

These two pieces of information essentially comprise an address for the information. When these two pieces of information are preceded by an abbreviation for a specific type of resource (usually "gopher" or "http"), the string of characters is called a Uniform Resource Locator (URL).

Examples of URLs are:

<http://bluegoose.arw.r9.fws.gov/FWSHomePage.html>

gopher://huh.harvard.edu/11/collections_info/aa

It is important to remember that the difference between upper and low case letters is important in URLs, unlike with e-mail addresses. But don't worry: as with all computer systems, if you make a mistake in typing the URL, be assured that you will get an error message.

WEBMAIL

In the past 3 or 4 years, a system of moving information between computers on the Internet was created

called the World Wide Web. Unlike e-mail, which moves only text-based information across the Net, the World Wide Web (the Web or simply WWW for short) can interactively move sound, moving images, still images, and text. The multimedia documents being produced these days, with embedded links to other computer documents, are known as web pages or hypertext documents. Not all Internet computers can deliver the web pages that are now the state of the art. However, even cc:Mail users can retrieve the text portions of these more sophisticated hypertext pages (without ever seeing them) by using a service known as Webmail. The service is available at four Internet addresses (that I know of):

webmail@www.ucc.ie

webmail@curia.ucc.ie

agora@w3.org (out of service, temporarily)

agora@www.undp.org

A request for a Web page returns only the text portion of the document. While the sounds, images, and movies are not returned, the URLs for links to other Web pages are returned. These URLs can then be used to retrieve additional documents. Using cc:Mail the steps are as follows:

- (1) select "Address to person" [enter]
- (2) select "np—Internet" [enter]
- (3) type one of the Webmail addresses given above [enter]
- (4) select "End addressing" [enter]
- (5) type a subject line (optional)
- (6) in the message body, type "go" (if using one of the Webmail addresses) followed by a URL. Alternatively, use the word "send" followed by a URL if using one of the agora addresses.
- (7) F10
- (8) send message



Web pages that I have found useful are:

<http://Internet.edu/about/scientis/menu.htm>

A list of scientists working on Long-term Ecological Monitoring Network (LTER) projects and links to other LTER information;

<http://www.nfrcg.gov/home-page/htmls.html>

A National Biological Service site that gives many links to Internet resources for biologists;

<http://bluegoose.arw.r9.fws.gov/FWSHomePage.html>

The U.S. Fish and Wildlife Service home page;

<http://www.nwi.fws.gov/Welcome.html>

Information on the National Wetlands Inventory with several links to other WWW resources;

<http://nmnhwww.si.edu/departments/vert.html>

Information on the vertebrate zoology department at the Smithsonian Institution Museum of Natural History;

<http://nmnhwww.si.edu/nmnhweb.html>

The home page for the Smithsonian's natural history museum;

<http://straylight.tamu.edu/bene/bene.html>

The site of the Biodiversity and Ecosystems Network webserver. This is one site where you can learn of e-mail lists related to biodiversity topics;

http://florawww.eeb.uconn.edu/FAM_DESC/fdlist.htm

An index of detailed plant family descriptions

By following other URL links you can, for example, retrieve family descriptions of the Rubiaceae at...

http://florawww.eeb.uconn.edu/fam_desc/Rubiaceae.htm

or the Ericaceae at...

http://florawww.eeb.uconn.edu/fam_desc/Ericaceae.htm

<http://www.aps.edu/HTMLPages/WERP.html>

Background information on the New Mexico Museum of Natural History Water Ecology Research Project;

<http://envirolink.org/enviroweb.html>

Links to many Web pages, including the Endangered Species Act On-Line, Environmental Legal Documents, and the Frog Information Server;

<http://ash.lab.r1.fws.gov/usfwslab.html>

Links to many wildlife related Web pages, including summaries of natural resource protection laws, such as the Lacey Act, the Migratory Bird Treaty Act, the Endangered Species Act, and others. A link to a list of endangered species is also included;

<http://envirolink.org/florida/other.html>

South Florida environmental resources; and

<http://www.satelnat.org/manatee/facts.html>

Facts about manatee biology and natural history.

GOPHERMAIL

Gopher provides menus or indexes of available text information in list form. It was named after the Minnesota Golden Gophers of the University of Minnesota where the software was first created. Items in each list are either titles for other menus or names of text documents. Menus do not just apply to one computer. Rather, a

Gopher menu on a computer in Seattle, Washington, may have list information for dozens of computers around the world.

To get a Gopher menu, send an e-mail message to one of the following addresses:

gophermail@calvin.edu
gopher@ucmp1.berkeley.edu
gopher@mercury.forestry.umn.edu
gopher@pip.shsu.edu
gopher@solaris.ims.ac.jp
gophermail@ncc.go.jp

Using cc:Mail, the steps are as follows:

- (1) select "Address to person" [enter]
- (2) select "np—Internet" [enter]
- (3) type one of the addresses above [enter]
- (4) select "End addressing" [enter]
- (5) type a subject line (optional)
- (6) type "help" in the message area
- (7) F10
- (8) send message

If you have a specific gopher URL that you want to reach (such as "gopher://sunsite.unc.edu/1m/./pub/academic/biology/ecology+evolution/bioguide/bioguide.item"), use one of the Webmail addresses from the table or place the computer host name in the subject line, as follows:

gopher.micro.umn.edu

Main gopher menu at the University of Minnesota;

muse.bio.cornell.edu

Biodiversity and biology menu at Cornell University;

biodiversity.ups.edu

Another biodiversity gopher menu;

gopher.epa.gov

Environmental Protection Agency Gopher menu; and

marvel.loc.gov

Library of Congress.

Gophermail will return a menu. When you select a document by placing an "X" before the document name and return the message to Gophermail, that document



will be sent to you. Whereas items that will take you to additional menus end with a forward slash ("/"), document names do not. By selecting a menu name with an

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“X” and sending the message, Gophermail will connect to the appropriate computer anywhere in the world and give you a new menu. That can be done iteratively until you give up, or find the information you are looking for. Because there are no rules as to which computers hold which information, you may find the same information on several computers, or you may not find what you are looking for.

CAUTION

Accessing the World Wide Web using e-mail is a lot like getting a transcript of a television program by U.S. mail: you get text and stage directions, but no images or sounds. Often the message needs reformatting. The servers providing these access services get extremely heavy use. Thus, expect a full day or more for a response. If you do not get a response in 4 or 5 days, resend your request. It helps to avoid sending requests during regular business hours when Internet use is staggering at many sites. Consider sending your requests at the end of your work day or at the end of a work week, so the server can process the request overnight or over a weekend. If you are at a site where the telephone lines give cc:Mail problems when large messages are delivered, consider sending only one request at a time. Reply messages are frequently more than one page and can often be several pages. Finally, these Internet-by-e-mail services are provided free of charge to all Internet users, worldwide, but can be costly to the providers. Thus, changes, cancellations, and interruptions to the services can and do occur.

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Steve Fettig is a NPS Biologist stationed at Bandelier National Monument, New Mexico. You may have guessed that his e-mail address is “stephen_fettig@nps.gov”.