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# Marine Turtle Newsletter

## GUEST EDITORIAL: Sea Turtles on the Internet

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A recent report released by the US Department of Commerce, "The Emerging Digital Economy" <<http://www.ecommerce.gov/emerging.htm>> gave the following examples of the growth and importance of the Internet: the number of people using the Internet world-wide increased by 250% to more than 100 million between 1996 and 1997; the number of registered domain names more than doubled to 1.5 million during the same period; traffic on the Internet has been doubling every 100 days; finally, and possibly most important to the continued existence and development of the Internet, projections of Internet-related business range to 50 billion US dollars by the end of the decade. It appears the Internet is here to stay!

### The MTN-Online

Although affordable Internet access is not universal to all readers, it is easily available to many. This situation is only likely to improve. For this reason the *Marine Turtle Newsletter* is now available in an online version <<http://www.seaturtle.org/mtn/>>. The Spanish version, *Noticiero de Tortugas Marinas* will soon follow. This initiative offers each new issue of the MTN/NTM as pages that users can browse, print and search on the World-Wide Web (WWW). In addition, complete electronic copies of recent issues are available in Adobe's Portable Document Format (PDF). These PDF files can be downloaded and viewed, searched and printed on your local computer. If printed to a laser-quality printer, readers can expect the same quality as the version normally received in the mail.

We hope that subscribers who have convenient access to the Internet will consider unsubscribing from the mail version and elect to receive the PDF version instead. Doing so will help the non-profit MTN/NTM remain a free service. Please make the effort and try it out.

Several extensions to the MTN/NTM mail subscription include the ability to: unsubscribe online as well as update mailing information; receive each new PDF issue via e-mail; or register to receive an e-mail notice whenever the MTN/NTM-Online has been updated. Readers may also elect to receive updates whenever back-issues are archived online, an ongoing project with the goal of having every issue of the MTN/NTM available electronically.

Other services available from the MTN-Online include: a Users Guide; a brief review of the history and mission of the MTN/NTM; an Online Registration form to collect subscriber information; Instructions for Authors; the ability to do an author/title-keyword Search of all online issue indices; simple online form interfaces for submitting Announcements, Job/Volunteer Listings, News and Legal Briefs, Letters to the Editors, and Recent Publications. Information submitted to the MTN/NTM regarding recent publications will also be forwarded to the Archie Carr Center for Sea Turtle Research in a standard format for inclusion in the Sea Turtle Online Bibliography (see below).

As this issue went to press (1 June 1998) the MTN-Online has had over 1,500 visitors from more than 24 countries. More than 600 PDF issues have been downloaded, 35 people have registered as users, and 22 have joined the PDF e-mail list. Please explore the MTN-Online, register as a user and try the PDF version.

With the availability of the *Marine Turtle Newsletter* on the WWW, it is time for a review of sea turtle resources on the Internet. What else is available?

### **Important Sea Turtle Resources**

Of an estimated 320 million pages on the WWW (Lawrence & Giles 1998), there are several hundred relevant to sea turtles. It is easy to see how one might get lost in the seemingly endless sea of the WWW. The following is not meant to be an exhaustive review, it simply touches on some of the sites with which I am most familiar. A complete list of the sites mentioned here and many more are available at:

<<http://www.seaturtle.org/>>. In addition, if you are reading this article on the MTN-Online, you can click on the addresses provided to visit each site.

### **Key Resources**

Two of the best sea turtle resources available on the Internet were also among the first to appear. These are CTURTLE and the Sea Turtle Online Bibliography established by the Archie Carr Center for Sea Turtle Research <<http://nervm.nerdc.ufl.edu/~accstr/>> at the University of Florida. These are extremely useful to all involved with marine turtles.

CTURTLE is an unmoderated LISTSERV e-mail network provided to facilitate communication between those interested in sea turtle biology and conservation. It acts as a forum for open discussion and instructions for subscribing are available at: <<http://nervm.nerdc.ufl.edu/~accstr/cturtle.html>>. The Sea Turtle Online Bibliography is one of many databases in the University of Florida's LUIS system. It contains numerous citations from recognized bibliographic sources as well as "grey literature". These cover all aspects of sea turtle biology, conservation and management. Instructions for accessing the Sea Turtle Online Bibliography via WebLUIS, TN3270 and VT100 are available on the Bibliography homepage <<http://nervm.nerdc.ufl.edu/~accstr/biblio.html>>.

### **General Sea Turtle Information**

There are a few sources of general sea turtle information available, but this is an area generally lacking in its quality and completeness. The Office of Protected Resources of the National Marine Fisheries Service <[http://kingfish.ssp.nmfs.gov/tmcintyr/prot\\_res.html](http://kingfish.ssp.nmfs.gov/tmcintyr/prot_res.html)> and Sea World/Busch Gardens <[http://www.seaworld.org/Sea\\_Turtle/stindex.html](http://www.seaworld.org/Sea_Turtle/stindex.html)> are good places to start. The former contains a general overview of each species while the latter has a very informative encyclopedia-style index of sea turtle terminology.

One of the most complete sites is EuroTurtle <<http://www.exeter.ac.uk/telematics/EuroTurtle/>> affiliated with Kings College, MEDASSET and Exeter University, UK. EuroTurtle provides a comprehensive review of most species, including morphology and distribution, and includes lots of good material for children. In addition, an area for university student use is being developed.

### **Specific Sea Turtle Information**

There are many sites that focus on specific species or aspects of sea turtle research and conservation. One of the best known, and probably the first sea turtle site on the WWW is Turtle Trax <<http://www.turtles.org/>>. Focusing on a community of green sea turtles in Hawaii, Turtle Trax contains a great deal of information related to fibropapillomatosis as well as being a good educational resource for school children.

Some other sites that provide focused information include: Drexel University's Leatherback Task Force <<http://www.coas.drexel.edu/enviro/leatherback/core.html>>; the Glasgow University Turtle Conservation Project <<http://www.gla.ac.uk/Acad/IBLS/DEEB/cyprus/turtle.html>>; the Sea Turtle Protection Society of Greece <<http://www.compulink.gr/stps/>>; Project TAMAR in Brazil <<http://www.ongba.org.br/org/tamar/home.html>>; the Temperature-Dependent Sex Determination in Reptiles pages at the University of Canberra <<http://aerg.canberra.edu.au/pub/aerg/tsd/tsdindex.htm>>; and the University of Florida, College of Veterinary Medicine's Fibropapilloma Page <<http://www.vetmed.ufl.edu/sacs/wildlife/fibpap.html>>.

## Education

Most sea turtle related educational materials on the Internet, like EuroTurtle, are primarily directed at younger children. Sites that do a wonderful job of stimulating young (and old) minds are those that not only provide information but also a chance to interact, either with project researchers or just with data alone. A good example is the Baja, Mexico, sea turtle tracking research of Wallace J. Nichols and Jeffrey Seminoff of the University of Arizona. They have made telemetric tracking data available through a mailing list primarily to school children who are encouraged to track and follow the turtles on their own. These data and others have been incorporated into sites like Turtle Trax and those of the Caribbean Conservation Corporation (CCC) Sea Turtle Survival League <<http://www.cccturtle.org/>> as educational aides. Another site to pique the interest is Sea Turtle Postage Stamps of the World <<http://www.2xtreme.net/nlinsley/>> compiled by Nancy Linsley and George Balazs.

## Conservation

Conservation organizations such as CCC have probably done the best job of adapting to the new online environment. Other conservation sites with a sea turtle focus include: Earthwatch <<http://www.earthwatch.org/>>; Earth Island Institute's Sea Turtle Restoration Project <<http://www.igc.apc.org/ei/strp/strpindx.html>>; and the World Conservation Monitoring Centre <<http://www.wcmc.org.uk/>>. These sites tend to be the most interactive, allowing visitors to "get involved".

## Services

There are an ever growing number of services on the Internet that sea turtle researchers and conservationists may find useful, including: TRAFFIC <<http://www.traffic.org/>>; HERPMED's list of herpetology and sea turtle related links <<http://www.xmission.com/~gastown/herpmed/>>; the Ocean Resources Foundation newsletter, Currents <<http://www.orf.org/>>; and the French Ministry of Environment's marine turtle index page, available in both French and English <<http://www.biop7.jussieu.fr/DNP>>, to mention just a few. A progressive step was the almost complete handling of all registration activities via the WWW for the 18th International Symposium on Sea Turtle Biology and Conservation <<http://ola.icmyl.unam.mx/Tortugas/>> hosted by the Mazatlán Research Station of the Instituto de Ciencias del Mar y Limnología <<http://ola.icmyl.unam.mx/>>. Another type of service that will hopefully be repeated for other species is Ken Dodd's most complete Bibliography of the Loggerhead Sea Turtle <<http://www.flmnh.ufl.edu/natsci/herpetology/herpetology.htm>>.

A good general tool for scientific searches is AltaVista <<http://www.altavista.digital.com/>>. More topically specific search engines include those like the US Environmental Protection Agency's Federal Register Environmental Documents page <<http://www.epa.gov/docs/fedrgstr/>> which allows users to search a database of environment-related regulations published in the US Federal Register. A good site for those seeking research funding is the National Science Foundation's FastLane <<http://www.fastlane.nsf.gov/>> which facilitates submission of research proposals and status inquiries.

## The Future

What does the future hold for sea turtles on the Internet? Hopefully there will be many more "interactive" sites that will allow users to get involved and excited about sea turtle conservation and biology. There are a few sites that go to great lengths to keep up-to-date, but there are many more that are just set-up and then forgotten about. Sites, with frequently revised news and project updates, constitute the bulk of "interactive" efforts regarding sea turtles. There is much more that can be done, including projects similar to those of Nichols and Seminoff that share data with children as an education tool. So far, most of these efforts have been in a conservation context.

Research interests have not been well represented on the Internet and information regarding certain regions, species and topics has been particularly lacking. There has been discussion of an online Passive Integrated Transponder (PIT) database that would allow users to instantly retrieve contact information when they encounter a turtle that has been PIT tagged. Such projects should be encouraged and implemented as quickly as possible. There is also great potential for the creation of other databases, such as for tracking flipper tags, strandings and nesting events. Or, imagine being able to specify a particular species, size range, or geographic extent and receive a graphical map of all telemetric tracking data for your query. Such products are already available on the WWW in other subject areas <<http://mapindex.nos.noaa.gov/>> <<http://www.esri.com/>>.

Finally, the Internet has great utility as a collaborative tool. It can be, and has been, used to speed communication between researchers and conservationists alike, but there is much more that can be done. CTURTLE and the 18th International Symposium on Sea Turtle Biology and Conservation website are excellent examples. Besides providing valuable information, the symposium website also allowed participants to register and submit paper and poster abstracts online, which are still available for visitors to browse. This same sharing of information can be accomplished with research and manuscript preparation or for electronic dissemination of materials and reports that many interested people would usually never see.

Currently available technologies, and the many more emerging everyday, can be used to facilitate collaboration and distribution efforts around the world. It is time their power was brought to bear in helping us solve many of the elusive problems we face in the study and conservation of sea turtles.

LAWRENCE, S. & C.L. GILES. 1998. Searching the World Wide Web. *Science* 280:98-100.