www.eol.org

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EOL officials are available for advance interviews.

Cool Tools Let Public Upload Images, Observations to Massive Interactive Online Biodiversity Encyclopedia

Growing community of citizen scientists donate over 30,000 images, upload information in global science collaboration of unprecedented scale;
Now 150,000+ pages with expert-vetted content;
Earth's inventory en route to 1.8 million pages – one for each known species;
Foundations extend additional $12.5 million as project marks 2nd anniversary;
Regional EOLs being developed around the world

Over 30,000 still images and video, as well as local information about changing biodiversity, have been uploaded to the Encyclopedia of Life via new tools that let the public contribute as never before to a global online science collaboration of unprecedented scale.

Experts and citizen scientists alike have fuelled explosive growth of the interactive encyclopedia, which dedicates a Web page to each known species and will eventually contain 1.8 million pages.

More than 150,000 species pages populated with expert-verified text and/or images are now available at EOL.org, a fast-growing inventory expected to shed new light on everything from conservation strategies for endangered species to climate change and the movements of disease-bearing or invasive pests. Some experts believe it may one day even help advance human longevity.

As the 10-year project marks its 2nd anniversary, EOL officials say pages with vetted information cover 150,000 species likely to be of greatest public interest. They also announced completion of over 75% of the encyclopedia's architecture, with 1.4 million placeholder pages now in place.

To build on the progress to date, an additional grant of $10 million was announced today by the John D. and Catherine T. MacArthur Foundation, which was one of the project's earliest supporters, providing an initial grant of $10 million in 2007.

And the Alfred P. Sloan Foundation, also a founding sponsor, announced $2.5 million in additional funding.

EOL is an online environment for presenting authoritative, well-organized species information, including DNA barcodes and other genetic sequences, from diverse global sources (content providers are listed at www.eol.org/content/partners), dramatically expanding its free availability to users everywhere.

To better serve non-English speaking users, EOL partners are creating regional versions, with information and digitized literature in local languages about local plants, animals and microorganisms. The first regional EOLs have been initiated in the Netherlands, Australia and China, with discussions underway in Central America, the Arab world, Indonesia and South Africa;

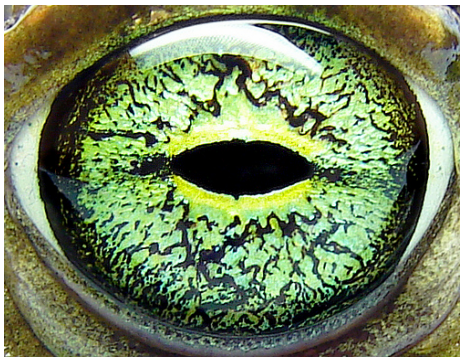
Contributors and users of what will be the ultimate online field guide are professional and citizen scientists, teachers, students, media, environmental managers, families and artists. Since its unveiling in early 2008, the site has attracted 1.8 million unique visitors from more than 200 countries.

With EOL now fully open to receive information from both specialists and the public, some 250 experts, including taxonomists, conservation biologists, graduate students and others, along with more than 1,200 citizen scientists, have already stepped forward to volunteer images, share data, or to write or curate pages.

EOL accounts are freely available and registered users can add comments or observations to a page or tag a species and search for its relatives.

Information submitted by the public, as well as images (via the photo sharing site Flickr www.flickr.com/groups/encyclopedia_of_life), appear with a yellow background until authenticated by experts. Almost 40% of the 31,000 images so far have come from five

photographers – from Portugal, Australia (2), Spain and Austria. The best of the lot, including winners of regular EOL photo contests, are showcased at http://www.flickr.com/groups/1056008@N20.



(Image of a European green toad, Bufo viridis. Credit: Matt Reinbold)

Among other newly-added interactive features: an online widget that automatically inserts links to EOL species pages into a digitized document. EOL's "NameLink" tool (http://labs.eol.org/?q=node/10/) identifies species names in a document and inserts an icon next to each that will take the reader to the relevant EOL species page.

EOL's Biodiversity Informatics Group, meanwhile, is beta testing "LifeDesks" (http://lifedesks.org) – independent online environments to facilitate communication and collaboration between scientists or organized groups of amateurs as they assemble and edit images, text, source references and other species information for EOL pages.

Under an initiative of the EOL Education Group, undergraduates at four universities – Harvard, Oregon State, the University of California-Berkeley, and the University of Wisconsin-La Crosse – are creating species pages. Under their professors' supervision, students at these institutions have prepared more than 100 fungi species pages, vetted by experts at MushroomObserver.org. Undergraduate student contributions to content partners Amphibia Web and Animal Diversity Web are also being served on EOL.

EOL has also launched a Fellows Program, oriented to postdoctoral students, graduate students and others who will contribute content from their own research and catalyze contributions from others in their scientific communities.

And at WhyReef (www.whyville.net/smmk/top/gates?source=reef), students can discover the marine life that lives in a virtual coral reef. Each species is linked to an EOL page with photos and descriptions of, for example, what eats what and other threats each may face. Students can also interact with scientists to ask questions.

"Creating a single portal to access a web page for each of the 1.8 million known species will provide a powerful tool to assist researchers and policymakers in better understanding biodiversity and discerning patterns of plant and animal behavior," says Arthur Sussman, MacArthur Vice President. "By integrating and consolidating information on species, EOL also

has the potential to accelerate scientific discovery and serve as an infrastructure for life sciences research."

Says Jesse Ausubel, Vice-President, Alfred P. Sloan Foundation: “The idea of an Encyclopedia of Life now seems so natural that people cannot believe that the EOL does not already fully exist. Even with the magic of the Internet, lots of blood, sweat and tears stand between the more than 150,000 well-represented species and the future when 1.8 million species will gaze out at us from www.eol.org. The work of growing EOL is gratifying, and the progress is visible week to week.”

“With new content and tools in place, EOL is open for business as never before. And we intend to harness the eyes and collective brainpower of hundreds of thousands of users to spot intriguing new information, share observations, and enhance EOL’s role as a leading provider of accurate and relevant biodiversity information,” says EOL Executive Director James Edwards, based at the Smithsonian Institution in Washington, DC.

“Collecting all of Earth’s species together in one place is an extremely ambitious undertaking, as only Noah knows,” adds Dr. Edwards. There are literally thousands of websites dedicated to individual aspects of biodiversity – to amphibians, plants or ants, for example, or to specific geographic areas. This unique collaboration between more than 100 leading international organizations is making vast amounts of information available in a common format, allowing users to more readily identify new species across different taxa and regions.”

Milestones in recent months:

* EOL partner The Biodiversity Heritage Library has now digitized more than 15 million pages of world biodiversity literature. Links let users access these references directly from an EOL species page. The BHL is also developing search algorithms to automatically find and extract information from digitized pages;

* In celebration of the 10-year Census of Marine Life project, which concludes in 2010, EOL is focusing on building up marine content with the goal of completing pages for 90% of known marine biodiversity – 215,000 species – by 2013;

* On May 15-16, EOL co-sponsored the Indiana Dunes National Lakeshore “BioBlitz” with the National Geographic Society and the U.S. National Park service. Over 2,000 students, along with teachers and volunteers, combed the area to record all the plants and animals observed (more than 1,700 species), with EOL-sponsored experts on hand to help participants identify, organize

and catalogue their findings via LifeDesks and upload them to the online encyclopedia;

* EOL's Biodiversity Synthesis Group has conducted 18 meetings involving hundreds of scientists from 35 countries in an effort to broaden the EOL's international reach and develop tools tailored to specific scientific interests and needs;

* A brilliant new "Preferences" feature in development will let users filter the entire EOL into a smaller version for any domain for which an index exists, such as all marine species or all the flora of Britain. This will be extremely powerful for personalizing EOL – simply paste in an index filter and with one click the user has a customized EOL with the subset of species of interest.

Early warnings of invasive species

The latest species page, published to mark the 25th anniversary of its arrival in Macedonia from the Balkans, describes an invasive moth, *Cameraria ohridella (see http://eol.org/pages/306084)*,which devastates the white-flowering ornamental horse chestnut trees popular in parks and gardens throughout Europe, leaving their leaves brown by midsummer.

Generations of children in many countries, especially Britain, associate the tree with "conkers," a game in which stringed chestnuts are hit by those of competitors to determine whose is toughest.

(Image of Cameraria ohridella: Credit David C. Lees)

Though the damage to leaves does not kill the tree, the moths' dramatically quick migration through Europe is touching off alarms in North America and Asia, where the insect could easily thrive once introduced.

Experts say the moth may also be evolving, in some places now infesting sycamore as well as horse chestnut trees.

"Like the opening of Pandora's box, this moth, first discovered in Macedonia in 1984, has spread like wildfire after a probable accidental release near Vienna in 1989," says page author and curator David Lees of the Natural History Museum, London and INRA, Paris. "It is now more

or less throughout Europe and poses a threat to ecosystems in Southeast Asia, North America and elsewhere – wherever the beautiful horse chestnut trees occur."

"An important ornamental tree is being devastated, one all too obvious in parks at this time of year," says Dr. Lees.

Like the "most wanted" posters in post offices, EOL will facilitate public recognition and awareness of such invasive species through detailed descriptions and maps, helping to slow their global spread and enable more rapid and effective remedial measures.

(Image of horse chestnut tree damage by Cameraria ohridella: Credit David C. Lees)

It is also expected to help map the present locations and movements of human disease vectors such as crows and mosquitoes and the shifting ranges of species due to climate change.

Unraveling secrets of long life

Scientists are equipping EOL for use in finding patterns within biodiversity lifespan and other life history data that could help explain, for example, why certain species, even those within the same family, live longer than others, opening promising new avenues of research into human aging.

Holly Miller, who leads the biology of aging portal at the Marine Biological Laboratory, Woods Hole, Massachusetts, says work is underway to relate EOL species information to medically relevant concepts – eventually allowing researchers to cluster and extract valuable aging-related insights.

Funded by the Ellison Medical Foundation, the effort will dramatically expand the number and kinds of organisms traditionally examined in aging research.

The benefit of using diverse species for such research can be seen in a recent report that certain butterflies that feed on fruit live longer than related species, leading to new investigations into the role played by genes, amino acids and food sources in the aging process.

Meanwhile, the lifespan of a Latin American bat (*Tadarida brasiliensis*, *www.eol.org/pages/327954*), curiously long compared to mice relatives of a similar size, may be the result of its body's ability to maintain a more stable physiological condition that mitigates cellular protein damage (see report at www.fasebj.org/cgi/content/abstract/23/7/2317).

"Most species have not been studied in a medically-relevant way," Dr. Miller says. "EOL is simplifying such research by creating a handy reference for the scientific and common names of species, body size, age of reproduction, habitat, geographic location and temperature and more, all of which could be relevant to unraveling longevity's secrets."

Says James Hanken, Director, Harvard Museum of Comparative Zoology and chair of the EOL Steering Committee: "The Encyclopedia of Life is one of the most vital and ambitious human endeavors ever undertaken. By enabling researchers from around the world to communicate and share research data, the EOL will make a lasting contribution to our fundamental understanding of life on earth."

Background

The EOL Steering Committee is comprised of senior authorities from Harvard University, Smithsonian Institution, the Field Museum of Chicago, the Marine Biological Laboratory at Woods Hole, the Biodiversity Heritage Library consortium, the Missouri Botanical Garden, and the MacArthur and Sloan Foundations.

The EOL Institutional Council contains more than 25 institutions from around the world and provides EOL with global perspectives and outreach capabilities. The Distinguished Advisory Board consists of 13 global leaders from the scientific and policy communities.

Technology giants, including Adobe, Microsoft and the Wikimedia Foundation, are providing active support.

Says Dr. Edwards: "EOL works with hundreds of content partners, all of which rely on the world's taxonomists, the scientists who study and name species. It is only through their heroic efforts that a resource like the EOL could even be contemplated."

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John D. and Catherine T. MacArthur Foundation (www.macfound.org)
The John D. and Catherine T. MacArthur Foundation supports creative people and effective institutions committed to building a more just, verdant and peaceful world. In 2007, MacArthur was one of the earliest supporters of EOL, providing an initial grant of $10 million.

Alfred P. Sloan Foundation (www.sloan.org)
The Alfred P. Sloan Foundation makes grants in science, technology and the quality of American life. Sloan's support for the Encyclopedia of Life melds its interests in environmental science with its interest in universal access to recorded knowledge.