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THE GBIF SCIENCE SYMPOSIUM 2011

GBIF AT 10: REAPING BENEFITS FOR SCIENCE AND SOCIETY

5 October 2011
Buenos Aires, Argentina

2011-2020
United Nations Decade on Biodiversity

PREFACE

The idea that birthed the Global Biodiversity Information Facility ten years ago remains as simple and powerful now as it was then: to make the world's biodiversity information freely and universally available for science, society and a sustainable future. It is GBIF's steadfast mission. It underpins its Secretariat in Copenhagen, a global hub, both physical and virtual, where the primary scientific data on the life of the planet is received, mobilized and served to the world. GBIF's network unites that world: the people, countries, organizations and institutions that come together to fulfil and benefit from GBIF mission.

In celebrating GBIF's ten-year anniversary, the GBIF Science Symposium 2011 provides a unique opportunity to tell the stories of how the network's Participants and partners, enabled by GBIF, made extraordinary advances that were previously impossible across a range of strategic areas, such as: building the global infrastructure for biodiversity informatics; providing seamless data exchange and networking; bringing the world's primary biodiversity into currency for science and society; weaving the worldwide social network of Participants and partners; and helping individual Participants build and grow their local, national and regional informatics capabilities and capacities.

The symposium's eight narratives trek across seven continents, from South America and Asia to Africa, Australia, Europe, Antarctica and North America. Beginning with Argentina, our host for the 18th meeting of GBIF's Governing Board (GB18), and ending with the VertNet consortium, the achievements highlight GBIF's impact on a global spectrum of constituencies. For example: a research scientist deploying GBIF-served data to explore and discover complex environmental dynamics, systems, patterns and processes; a policy maker incorporating GBIF-enabled scientific research to inform environmental solutions across social, economic, and political entities; a science minister seeing how GBIF has provided a greater return on a country's investment in its national biodiversity institutions and enterprises; or an environmental minister using GBIF data to implement smart land management, conservation strategies, and national and international reporting requirements. This sharing of success stories, lessons learned, and best practices can hone GBIF's effectiveness today and enhance its impact in the coming ten years.

As is traditional, the 2011 Ebbe Nielsen Prize winner, Jens-Christian Svenning, will usher in the GBIF Science Symposium 2011, presenting his work on the large scale dynamics between organisms and their environments, from the Ice Ages to the present day, and from Europe to the tropics. His innovative research exemplifies how GBIF-served data allows reconstruction and modelling of the effects of climate change on biodiversity and ecological macrosystems through time and across space.

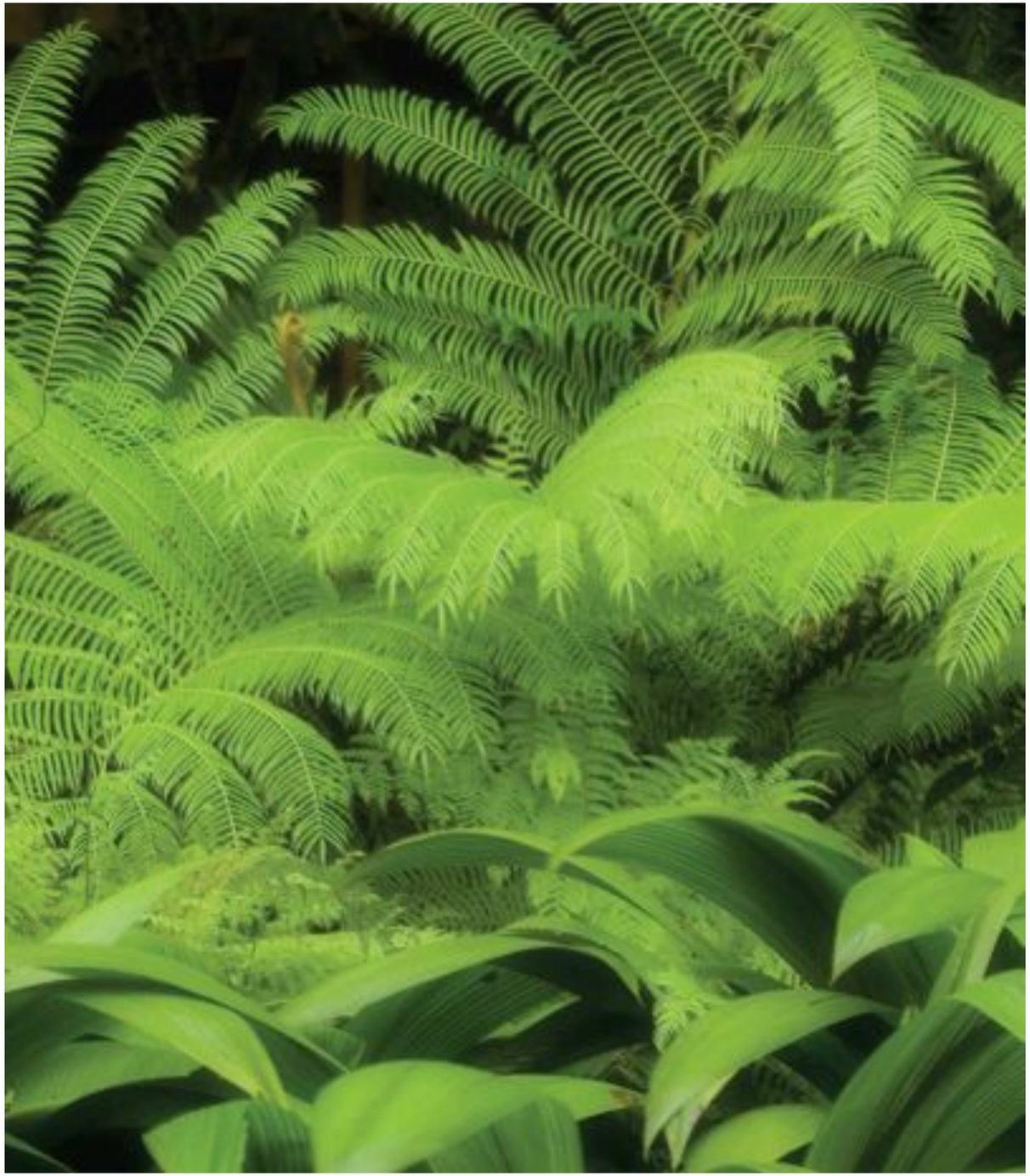
Ten years on, through scholarship and achievements engendered by the GBIF community, we toast the enduring power and success of the GBIF idea.

LEONARD KRISHTALKA

Chair, GBIF Science Committee
Director, Biodiversity Institute
University of Kansas
Lawrence, Kansas, USA

PROGRAMME

09:00 – 09:10	Symposium introduction and welcoming remarks Leonard Krishtalka Chair, GBIF Science Committee Marta Rovira President of CONICET Argentina
09:10 – 10:00	GBIF Ebbe Nielsen Prize Winner 2011 Presenter: Jens-Christian Svenning Department of Biological Sciences Aarhus University, Denmark
10:00 – 10:30	GBIF and ten years of biodiversity informatics in Argentina Presenters: Edgardo Romero, Martín Ramírez
10:30 – 11:00	Developing a biodiversity information facility for ecological sustainability and economic growth: the Indian initiative Presenter: V.B. Mathur
11:00 – 11:20	Coffee Break
11:20 – 11:50	The South Africa Biodiversity Advisor: in support of the user Presenter: Selwyn Willoughby
11:50 – 12:20	The Atlas of Living Australia — a national biodiversity information facility Presenter: Donald Hobern
12:20 – 12:50	GBIF Spain Presenter: Francisco Pando
12:50 – 14:00	Lunch
14:00 – 14:30	SEP–CEPDEC: Lessons learned from a contribution to GBIF outreach in Africa, Indian Ocean and South-East Asia Presenters: Eric Chenin, Pierre Radji
14:30 – 15:00	An overview of Antarctic biodiversity networks Presenter: Bruno Danis
15:00 – 15:30	Building a data sharing community: VertNet Presenter: David Bloom
15:30 – 15:45	Coffee Break
15:45 – 16:30	Panel discussion



GBIF EBBE NIELSEN PRIZE WINNER 2011

JENS-CHRISTIAN SVENNING

Department of
Biological Sciences
Aarhus University
Denmark

THE EBBE NIELSEN PRIZE

The prize honours the memory of Ebbe Nielsen, an inspirational leader in the fields of biosystematics and biodiversity informatics, who died in 2001 whilst en route to GBIF's first Governing Board meeting.

It is awarded annually to a promising researcher who combines biosystematics and biological diversity informatics research that supports the objectives of GBIF in an exciting and novel way.

The winner of the 2011 Ebbe Nielsen Prize, Professor Jens-Christian Svenning is head of the Ecoinformatics and Biodiversity Group, Department of Biological Sciences at Aarhus University, Denmark. He has authored 81 peer-reviewed papers in scientific journals, as well as several popular science publications and educational textbooks. Svenning is deputy editor-in-chief of Ecography and associate editor of the Journal of Biogeography. He is a member of the Royal Danish Academy of Sciences and Letters.

ON CLIMATE AND EARTH'S BIODIVERSITY – INSIGHTS FROM ECOINFORMATICS STUDIES

09:10 – 10:00

Understanding the links between climate and Earth's rich biodiversity is one of the main challenges for science. It is clear that future climate change constitutes a major threat to biodiversity, but our current understanding of the climate sensitivity of biodiversity is very incomplete. The same applies to even the basic roles climate plays in the evolution, ecology and geography of biodiversity. The massive increases in the availability of geospatial biodiversity and environmental data in combination with creative informatics approaches (ecoinformatics) offer new opportunities for making headway on these key issues. Svenning will discuss how such approaches are leading to new insights into the links between climate and biodiversity, with special focus on biodiversity's sensitivity to climate change. He will provide examples of new progress on the long-lasting legacies of paleoclimatic changes on current biodiversity patterns, on the role of climate in controlling tropical species distributions, and on assessing the scope for local buffering of climate-change effects on biotic assemblages. The conservation implications will be summarized and discussed. He will end by outlining key possibilities and challenges for further progress.

ARGENTINA

EDGARDO ROMERO

Edgardo Romero is Director of the Bernardino Rivadavia Natural Sciences Museum of Argentina (Museo Argentino de Ciencias Naturales Bernardino Rivadavia, or MACN), based in Buenos Aires, and professor at the University of Buenos Aires. He is also Principal Investigator of CONICET, an Argentine government agency which directs and co-ordinates most of the scientific and technical research in the country. Romero is head of the Argentine delegation to the GBIF Governing Board. He specializes in angiosperm paleobotany.

MARTÍN RAMÍREZ

Martín Ramírez is General Curator of MACN, independent researcher for CONICET and Adjunct Professor at the University of Buenos Aires. He is also the node manager for GBIF Argentina. His area of research is systematics and taxonomy of spiders and phylogenetic methodology.

GBIF AND 10 YEARS OF BIODIVERSITY INFORMATICS IN ARGENTINA

10:00 – 10:30

Argentina became an Associate Participant of GBIF in March 2002, just one year after the facility came into existence. The Argentine Network of Collections was built up with seed money from GBIF to assist with training in curation, use of IT tools, standards and georeferencing. Other national institutions including the National Scientific and Technical Research Council (CONICET) and the Ministry of Science and Technology soon became involved in biodiversity informatics.

In 2007, Argentina became a Voting Participant, and by 2009 had developed a national biodiversity information system, the Sistema Nacional de Datos Biológicos (SNDB), which includes an online data portal, and provides funding to digitize collections. To date, some hundred collections, involving more than five million individual records, have been digitized.

Biodiversity occurrence data, whose mobilization has been greatly assisted by Argentina's participation in GBIF, have been used for a wide variety of applications in Argentina. They include:

- Determination of areas of endemism
- Recommendations for protected areas in Patagonia
- Delineation of important areas for conservation of birds
- Assessments of the flora of southern South America
- The biodiversity information system of the National Parks Administration.

Through further integration of the participant institutions of SNDB, and using GBIF resources, the distribution of data and products to a wide community of users in Argentina is envisaged, as well as the enrichment of primary biodiversity data using feedback from users.

INDIA

V.B. MATHUR

Vinod Mathur is the Dean of the Faculty of Wildlife Sciences at the Wildlife Institute of India, located in Dehradun. He is also Deputy Vice-Chair of the IUCN-World Commission on Protected Areas (Asia); Deputy Coordinator, Wildlife Conservation and Management, for the International Union of Forest Research Organizations (IUFRO); and a member of the International Association of Impact Assessment (IAIA). Mathur currently serves as a member of several committees of the Ministry of Environment and Forests, Government of India.

*DEVELOPING A BIODIVERSITY INFORMATION FACILITY FOR ECOLOGICAL SUSTAINABILITY AND ECONOMIC GROWTH: THE INDIAN INITIATIVE**

10:30 – 11:00

Efficient access to and use of biodiversity data is critical for effective conservation and sustainable development, nowhere more so than in a mega-biodiverse nation such as India. The information about India's rich and varied biological resources currently exists in isolated and heterogeneous forms and formats, and often locked up in individual and institutional domains. The nation lacks a conducive framework for discovery, publication and use of this data for meeting both conservation and developmental imperatives.

Biodiversity informatics is the cornerstone of environmental, economic and social well-being. India has embarked on an initiative to establish a biodiversity information facility (INBIF) in line with GBIF's operational principles and network architecture. INBIF's vision is to contribute towards ecological sustainability and economic growth, through increasing and improving the discovery, accessibility, completeness and utility of existing and new biodiversity data and information. The INBIF mission is to promote and enable free and open access to Indian biodiversity data through a distributed and internet-based network of data custodians and publishers to underpin science, conservation and sustainable development. To address challenges in the field of biodiversity information, INBIF has five broad and integrated strategic initiatives : (i) serving biodiversity data: content for science and society; (ii) building, consolidating and expanding informatics infrastructure; (iii) strategic partnerships: engagement and cooperation; (iv) capacity and networking; and (v) governance and networking.

INBIF is actively collaborating with other countries and regions, to benefit from experience elsewhere in the area of biodiversity informatics. The Atlas of Living Australia is acting as mentor, sharing expertise on understanding the needs of data users, and strategies for demand-driven digitization and publishing. INBIF is collaborating with Norway on investigating innovative ways to capture and publish camera trap data, and with South Africa to promote publishing of biodiversity data from environmental impact assessments.

As part of INBIF's activities, India plans to develop a 'National Biodiversity Information Outlook (NBIO)' – a tool for use by biodiversity stakeholders, data custodians/ publishers and users to foster, further and harmonize the progress in biodiversity informatics. INBIF's operationalization is spread over a five-year period (2011-2016) at an estimated cost of US$ 10 million. The key challenges for INBIF lie in garnering funding from both national and international sources and in channelling human capacity (existing and potential) to make the INBIF operational.

* This presentation was co-authored by Hem Pande, Joint Secretary, Ministry of Environment and Forests, Government of India, and Head of Delegation to the GBIF Governing Board.

SOUTH AFRICA

SELWYN WILLOUGHBY

Selwyn Willoughby is director for Biodiversity Information Management at the South African National Biodiversity Institute (SANBI). He is responsible for overseeing the monitoring of the status and trends in biodiversity and for the South African Biodiversity Information Facility (SABIF). Willoughby developed the Biodiversity Information Policy Framework, which provides a national framework for responsible and accountable sharing and use of biodiversity information.

THE BIODIVERSITY ADVISOR: IN SUPPORT OF THE USER

11:20 – 11:50

In 2010, the International Year of Biodiversity, the South African National Biodiversity Institute launched the Biodiversity Advisor portal. The aim of the portal is to provide free and open access to biodiversity information, in particular to support research, planning, decision-making, policy formulation and monitoring activities.

The South African node, the South African Biodiversity Information Facility (SABIF), actively engaged with the GBIF network and secretariat to implement best practices in mobilizing biodiversity data in the country. The outcome of this engagement not only benefited the SABIF programme and its associated scientists, but provided a firm foundation to extend our delivery of biodiversity information and tools to users beyond the scientific community. Through our involvement in GBIF we could draw on available resources to assist in the development of the Biodiversity Advisor, ranging from conceptual design to practical implementation.

The Biodiversity Advisor provides not just access to data, but also advice on how to include biodiversity information in areas such as spatial planning, biodiversity planning and land-use decision making, such as in Environmental Impact Assessments (EIAs). A measure of success of any initiative is its ability to meet the demands of its users.

With this in mind, the Biodiversity Advisor will be updated to include new tools such as the GBIF Environmental Impact Assessment Primary Biodiversity Data Publishing Tool, which is piloted in South Africa, and a coal mining and biodiversity decision support tool. The Advisor will also strengthen its support and content on biodiversity monitoring.

Overall, South Africa's participation in GBIF has resulted in an increase in available biodiversity data, and this has supported the development of the Biodiversity Advisor, thus advancing understanding of the constraints and opportunities in using biodiversity data.

AUSTRALIA

DONALD HOBERN

Donald Hobern has been Director of the Atlas of Living Australia since 2007. Prior to this, he was Deputy Director for Informatics at the GBIF Secretariat. Between 2008 and 2010 he was Chair of TDWG Biodiversity Information Standards, the international standards organization for biodiversity data. Hobern has a background in software development and web architecture, including 16 years working for IBM in the UK, the US and New Zealand. He has a life-long passion for natural history and is an active lepidopterist.

THE ATLAS OF LIVING AUSTRALIA – A NATIONAL BIODIVERSITY INFORMATION FACILITY

11:50 – 12:20

The Atlas of Living Australia is a collaboration between Australian natural history collections and research agencies to organize the country's biodiversity data. The project has been funded by the federal government and aims to provide essential infrastructure to support research, policy and education.

The ALA team surveyed national needs for access to biodiversity information in research, planning, conservation, education and amateur natural history to set the priorities for the data, tools and services to be delivered. In addition, the ALA worked with each ALA partner institution or organization to document its collections, existing databases and research interests, and to plan joint activities to improve delivery and management of biodiversity data.

Following these requirements, the ALA partners have succeeded in integrating data from an expanding number of faunal collections, herbaria, research centres, government agencies, resource management groups and citizen science groups. Key products include: a comprehensive checklist of species recorded in Australia; over 23 million records from specimens or observations; rich tools for mapping species distributions and exploring the environments in which they occur; improved access to images, literature, identification keys, barcode sequences and other information for each species; data management software for citizen science groups; significantly improved capability within collections for imaging specimens; projects to engage volunteers in databasing specimens; data quality tools; and processes for handling data on species of conservation or biosecurity concern.

The ALA is serving as Australia's National Biodiversity Information Facility, acting as the national node for GBIF, and also a node or partner in the Encyclopedia of Life (EOL), Biodiversity Heritage Library (BHL), Barcode of Life Database (BOLD), Catalogue of Life (CoL) and Morphbank. The development of this combined infrastructure is encouraging many other organizations and agencies to adopt the ALA as their data management system.

SPAIN

FRANCISCO PANDO

Francisco Pando is a researcher at the Spanish National Science Council (CSIC) in Madrid. He is the manager of the Spanish GBIF node and Chair of the GBIF Participant Node Managers Committee. Pando has previously been keeper of the cryptogamic collections (a taxonomic group that includes seedless plants and plant-like organisms such as mosses, lichens and fungi), at the Royal Botanical Garden in Madrid.

GBIF SPAIN

12:20 – 12:50

Eight years after its inception, GBIF Spain is a consolidated network of people and organizations (research institutes, collections, projects, public agencies, associations) actively engaged in the mobilization, publication and use of biodiversity data.

At the core of this endeavour is the GBIF.ES Coordination Unit (the node), whose mission is to support biodiversity-oriented centres, projects and associations to fulfil their objectives and help them to share their data. We place emphasis on, and are very active in, training, digitization tools, hosting data, documenting metadata and international networking, especially with Latin America.

GBIF has been very important and useful for Spain in building at speed the national biodiversity network in several respects: the concept (distributed network), the technology (e.g. DIGIR, TAPIR, Darwin Core, the portal), and the procedures (good practices).

GBIF and the Spanish node provide an efficient way to:

- Make the data produced by biodiversity projects accessible, producing a better return of investment.
- Put the investment on natural history collections to work by unlocking the information they contain.
- Provide a platform that allows very relevant issues, both scientific and societal, to be tackled in a way that will save millions of euros by avoiding the need to collect information that already exists – i.e. information that is available but not accessible.
- Support the science that underlies sound conservation and management; and conversely get into the scientific channels the research that is produced as part of management and conservation efforts.

GBIF Spain is recognized as a key component of the National Biodiversity and Conservation Strategy (it is a member of the National Committee), and of LifeWatch.

SUD EXPERT PLANTES (SEP)

ERIC CHENIN

Eric Chenin is the Initiative Manager for Sud Expert Plantes. He is also manager of the GBIF French node, which is hosted by the Institut de Recherche pour le Développement (IRD), in Orléans. Chenin is an engineer by training and has extensive experience in informatics.

PIERRE RADJI

Pierre Radji is Administrative and Technical Director and Curator of the Botanical Garden and Herbarium of Togo, located at the University of Lomé. He is also the node manager of GBIF Togo. In his role as the Director or the Botanical Garden, Radji liaises with 289 botanical gardens on five continents.

SEP-CEPDEC: LESSONS LEARNED FROM A CONTRIBUTION TO GBIF OUTREACH IN AFRICA, INDIAN OCEAN AND SOUTH-EAST ASIA

14:00 – 14:30

Sud Expert Plantes (SEP) is a French initiative aimed at helping the efforts of 22 developing countries in Africa, Asia and the Indian Ocean to gain knowledge of, preserve and sustainably use their plants.

SEP and GBIF joined forces in these countries to raise awareness of the importance of biodiversity information, promote GBIF participation, help participant countries organize their biodiversity information networks, and encourage mobilization of country-hosted data and use of the GBIF portal.

A sub-programme of GBIF's CEPDEC (Capacity Enhancement Project for Developing Countries), with strong involvement of the targeted developing countries, SEP-CEPDEC addressed the issues of information standards, management, sharing and use.

Several obstacles prevent countries of the South from efficiently managing, sharing and using biodiversity data: chiefly, the lack or scarcity of awareness, technical skills, know-how and internet access.

SEP-CEPDEC attempted to reduce these obstacles with five technical training sessions on collections digitization, connection to GBIF and examples of data uses, as well as national and regional workshops on various aspects of data sharing and use.

In two years, four more countries have become members, and more are expected to join soon. In each member country, operational nodes have been set up, and a total of more than 25,000 data records have been published through the GBIF network.

A new phase is being set up for the period 2012-2016, with the aim of promoting wider membership and harnessing databases for research, decision-making and efficient biodiversity management, preservation and use.

SCIENTIFIC COMMITTEE ON ANTARCTIC RESEARCH-MARINE BIODIVERSITY INFORMATION NETWORK (SCAR-MARBIN)

BRUNO DANIS

Bruno Danis is a marine biologist from the Royal Belgian Institute of Natural Sciences, who has spent a large part of his professional career working on biodiversity databases. Since 2005, he has been working on SCAR-MarBIN – a database to keep track of marine life and biodiversity in Antarctica. Danis is also managing the Antarctic Biodiversity Information Facility (ANTABIF).

AN OVERVIEW OF ANTARCTIC BIODIVERSITY NETWORKS

14:30 – 15:00

The new Antarctic Biodiversity Information Facility (ANTABIF) has become a vital and practicable support for an international mechanism to exchange scientific data. Its approach allows the integration of large data volumes and helps today's biologists to cope with a 'data deluge', using new techniques and technologies recently developed in the field of biodiversity informatics.

Biodiversity science is data intensive, and requires an interdisciplinary, scalable approach to address complex systemic problems such as environmental change and its impact on marine ecosystems.

Scientists involved in ANTABIF and SCAR-MarBIN sought to collect, curate, and provide data during the timeframe of the International Polar Year, helping to bring positive attention to Antarctic biodiversity. The project has provided experience of data exchange between databases through the internet and data publishing strategies; and it is now building upon GBIF-supported standards, protocols and informatics tools.

SCAR-MarBIN is based on a vision of discoverable, open, linked, useful and safe data, and demonstrates the need for a rapid socio-technical evolution in the overall science data interface.

VERTNET

DAVID BLOOM

David Bloom is the project coordinator for VertNet, a global museum database of vertebrate natural history collections. Bloom has been working with museums, collections, and the public for nearly 20 years. His work is focused on bringing museums and the public together to build community, promote knowledge of the natural world, and drive informed research, decision-making, and education.

BUILDING A DATA SHARING COMMUNITY: VERTNET

15:00 – 15:30

Since the inception of MaNIS (information network on mammals) in 2001, and continuing with the subsequent vertebrate networks (HerpNET, ORNIS, FishNet covering reptiles and amphibians, birds and fish respectively), participation included a commitment to publish data through the GBIF network. Members of these communities have worked closely with GBIF to strengthen the data sharing community, develop publishing tools and provide training around the world.

The vertebrate networks invested heavily in the cultivation of communities that shared expertise in addition to large quantities of published data. These communities overcame early scepticism and have changed the culture of data sharing in the biodiversity domain. The success of these community networks has surpassed expectations, driving new developments to keep up with growing demands for participation.

Known collectively as VertNet, the networks now facilitate hundreds of museum collections and observational organizations that together contribute over 85 million records to the VertNet and GBIF data portals. With new funding from the US National Science Foundation, VertNet is creating a single, integrated data portal that uses cloud-based computing for a fast, scalable, and sustainable data platform. VertNet will build on the existing communities to enhance data quality, discovery and visualization.

Photo sources:
ANDEEP3 expedition, 2004/2005
Australian National Insect Collection
David Bloom, VertNet
fotolia.com
Greg Basco – deepgreenphotography.com
istockphoto.com
1999 PhotoDisc Inc.