

Broadening e-access to resources at the South African Institute for Aquatic Biodiversity (SAIAB)

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Abstract: The South African Institute for Aquatic Biodiversity (SAIAB), located in Grahamstown, houses South Africa's largest fish collection and a range of fisheries and biodiversity resources. SAIAB is a division of South Africa's National Research Foundation and is affiliated to Rhodes University. Coinciding with the opening in March 2007 of the new storage facility for the National Fish Collection, the SAIAB Information Portal was launched to provide web-based access to six inter-linked categories of the Institute's research resources. The first part of this paper focuses on the proposed widening of e-access to resources within SAIAB's Margaret Smith Library, particularly its rare books collection and back issues of publications of the Institute. The rare books, which have been stored at SAIAB since the 1950s, have recently been fully catalogued, with possible plans for digitizing selected texts of specific value. A policy decision was made in 2006 to digitize all back issues of publications of the Institute, which date back to the 1950s, and to make them available via the website. In addition, it has been proposed that the SAIAB Library play a partnership role in the initiative to digitize freshwater African fisheries and aquaculture information, and to contribute this and other African material to the IAMSLIC Aquatic Commons. The second part of the paper outlines the newly created SAIAB Information Portal, a web-based tool for enabling access to SAIAB's considerable research resources. Alongside the library window of the portal, five categories of resources are accessible electronically: the Fish Collection Database, the Image Collection, Biodiversity Informatics, Online GIS and Taxonomic Data. The steps taken to broaden e-access to SAIAB's resources create the need for new training and skills as the SAIAB librarian promotes information literacy amongst researchers using the Institute's facilities.

Introduction to the J L B Smith Institute and SAIAB

In 1946 Professor J L B Smith founded the Department of Ichthyology at Rhodes University in Grahamstown, the first such institution in South Africa. He had been a lecturer in Chemistry at Rhodes since 1923. His growing interest in the scientific study of fishes was a by-product of fishing holiday camps for students and staff at Rhodes University (Smith, M. 1969). During the 1930s he classified the fish collections of all the museums of South Africa's Eastern Province, the region surrounding Grahamstown. Smith rose to international fame in 1939 when he was asked by the Director of the East London Museum, Dr Marjorie Courtenay-Latimer, to identify an unusual fish. After a meticulous description, involving six months research in early 1939, he pronounced the specimen to be Coelacanth *Latimeria chalumnae*. He wrote up the fascinating story of the coelacanth, with subsequent finds in the West Indian Ocean, in his book *Old Fourlegs – The Story of the Coelacanth* (1956). This seminal book was subsequently translated into Afrikaans, German, French, Russian, Estonian, Slovak, Japanese and Dutch editions.

The prolific research of the husband and wife team of JLB and Margaret Smith placed South Africa firmly on the ichthyology map. *The Sea Fishes of Southern Africa* became a flagship publication. First published in 1949, it ran to a fifth edition by the mid 1960s. The Smiths developed a research speciality on the fishes of the West Indian Ocean, but worked throughout southern and eastern

Africa. During the course of his academic career, J L B Smith produced nine books (3 in Chemistry, 9 in Ichthyology) and 14 scientific papers in Chemistry and over 200 in Ichthyology (Smith, M 1969). He described over 375 fishes as new to science. He wrote over 400 popular articles relating to his work. Margaret began as an illustrator, but during the 1950s became an established ichthyologist in her own right. By the 1960s the Department of Ichthyology had become world-renowned and it boasted a very large fish specimen collection.

Soon after J L B's death early in 1968, the South African Council for Scientific and Industrial Research (CSIR) and Rhodes University decided to establish the J L B Smith Institute of Ichthyology in a newly designed facility. The CSIR had funded much of Smith's research activity since the 1940s. Margaret Smith was appointed the first director of the newly established Institute. The new building housing the Institute was finished in 1975 and officially opened in 1977. As part of the new facility, the fish collection – the largest of southern African marine fishes in the world – was arranged in an extensive new museum, a research library was established and the staff complement grew.

In 1980, the Institute was established as a National Museum, independent of Rhodes University and yet closely tied to it. A complimentary development was the founding of a new Department of Ichthyology and Fisheries Science at Rhodes University. When the illustrious Margaret Smith retired as Director of the J L B Smith Institute in 1982, a brochure produced in her honour described the transition of the Institute under her 14-year directorship 'from a classical taxonomic research unit to an Institute integrally involved in national and international research programmes on biological systematics, zoogeography, morphology, ecology and fisheries management and fish culture.' (Anonymous 1982).

Pote (1996) provides a detailed overview of major activities and landmarks of the Institute during the 1980s and 1990s under the directorship of Dr Mike Bruton. The Institute received donations of substantial fish collections to augment its already famous collection; conferences, publications and commissioned research signalled its growing national and southern African profile as a museum and research centre in both marine and freshwater fisheries science and aquaculture. The early 1990s saw the Institute initiate its 'JAGO Expedition', the first ever submersible research dives off South Africa. As a result of business funding, the Institute was able to begin running FISHLIT, its own computerised bibliographic information service, on in-house computers. In 1992, the national Foundation for Research Development and Rhodes University funded the installation of a local area network to link FISHLIT with users on campus, and at other institutions. In 1995 FISHLIT was sold to the National Information Services Organisation (NISC) and the Institute librarian, Margaret Crampton, moved to become the manager of NISC SA in Grahamstown.

Dr Paul Skelton, who had been Curator: Freshwater Fishes, succeeded Mike Burton as Director of the Institute in 1995. Under Skelton, the J L B Smith Institute was transferred to the National Research Foundation of South Africa in 1999 and was re-constituted as the South African Institute for Aquatic Biodiversity (SAIAB). As the new name indicated, the Institute was recognised as a leading national facility in the new post-apartheid political dispensation. SAIAB's Vision Statement commits it to 'Serving Africa's needs in understanding fisheries and aquatic environments'. According to its Mission Statement, the Institute strives to be 'an interactive hub ... generating, disseminating and applying knowledge to understanding and solving problems on the conservation and wise use of African fishes and aquatic biodiversity.' (<http://www.saiab.ru.ac.za>)

SAIAB has continued to be one of the leading aquatic research institutes in southern Africa, with a high profile across a number of fields. The Institute's Programmes Unit manages multi-disciplinary, multi-partner research projects in marine and inland systems. SAIAB's research and partnership activities are serviced by the Margaret Smith Library, with its extensive holdings on

fisheries and aquaculture, and by the National Fish Collection, the largest in Africa. The Institute's Communications Unit aims to disseminate research findings and promote public awareness and understanding of fishes, conservation and the use of aquatic environments.

SAIAB's Margaret Smith Library

From its inception in the late 1960s, the Margaret Smith Library has been a facility shared between SAIAB and Rhodes University. It currently houses approximately

- 5 290 books
- 1 970 journal titles 46 current subscriptions 236 titles received on exchange agreements and donations
- 30 000 items in a reprint collection dating back to 1842
- 206 books in its Rare Books Collection
- Microform collection

The Rhodes University Library uses the Millennium system (Innovative Interfaces) and, as a branch library, the SAIAB library is part of this system. The acquisition, cataloguing, and processing of all new books and journals is centralized at the Rhodes Library.

As a shared facility with the Rhodes Library, the SAIAB Library has access to online electronic information resources which include Academic Search Premier (via EBSCOhost, ScienceDirect, SpringerLink and a range of others, providing full text access to an ever increasing number of journals. The recently established e-repository of postgraduate theses, available on the Rhodes Library website adds to the growing range of e-resources. (<http://www.ru.ac.za/library>)

In addition to the existing research resources via the Rhodes University web page, SAIAB is currently embarking on two projects that are specifically aimed at broadening access to two sets of Institute-specific resources: the Institute's rare book collection and SAIAB's institutional publications.

The rare book collection at SAIAB

There are 206 items in SAIAB's rare book collection, which was mostly built up in the 1950s due to the concerted efforts of J L B Smith. The earliest publication dates back to 1546, but most of the items were produced in the 18th and 19th centuries. The literature spans ichthyology and natural history texts relating to a number of regions of Africa, and to countries such as Ceylon, Japan, the British Isles, Malaysia, Scandinavia, the United States and Spain. Authors of note in the collection include Cuvier, Bloch, Bleeker, Boulenger, Day, La Cedepe, Willughby and Yarrell. There are volumes containing exquisite illustrations. Recognising their value, the Library stores the rare books separately and only allows them to be consulted in the Library. Visiting national and international researchers have commented positively on the value of the collection.

From the start of 2006, the complete collection was included on the OPAC catalogue. Plans for digitization are at a very early stage, but the principle has been approved. The most appropriate texts for scanning will need to be selected. SAIAB does not have the necessary and expensive scanning equipment. There is the possibility of working in co-operation with Digital Imaging South Africa (DISA), which has received funding from the Mellon Foundation for various digitization projects in South Africa (Peters 2007). Increased knowledge of the collection will increase usage and therefore a usage policy will need to be developed in order to maintain the security of the collection (RBMS Security Committee 2006).

SAIAB's institutional publications

SAIAB's institutional publications originated in the 1950s and include Bulletins, Special Publications, Occasional Papers, Investigational Reports, and a Newsletter.

The Rhodes University Department of Ichthyology began publishing an Ichthyological Bulletin in 1956, producing 33 bulletins by the time of J L B Smith's death in 1968. In 1969, with the creation of the new Institute, this Bulletin was re-named the J L B Smith Institute of Ichthyology Bulletin, and Numbers 34 to 72 were published between 1972 and 2001. In 2002, following the formation of the South African Institute for Aquatic Biodiversity, the Bulletin was re-named the Smithiana Bulletin, in honour of J L B and Margaret Smith, with Number 1 published in 2003.

The Rhodes University Department of Ichthyology began publishing a Special Publications series in 1967. The following year it was re-named the J L B Smith Institute of Ichthyology Special Publication, which continued through 66 Numbers to 2001. Continuing the series, the first issue of Smithiana Special Publication was produced in 2002.

In addition, the Department of Ichthyology produced 15 Occasional Papers between 1964 and 1968, all of them written by J L B Smith himself.

The Investigational Report series consists of field trip reports and some report submissions for commissioned research. Finally, there is the *Ichthos Newsletter*, a more popular information source with news and reports on research trips. Number 1 was published in October 1982 and Number 75 was the last to be published, in 2005.

During the 1950s and 1960s it appeared that Smith and other local researchers used institutional publications to publish and disseminate their prolific research, in addition to publishing in conventional scientific journals. Many of the institutional publications contained valuable descriptions of new species and notes from collection expeditions.

Believing that these institutional publications are valuable resources, and knowing that they have not been widely distributed and are not widely accessible, the SAIAB management accepted a proposal from the library to digitize them. Since the start of the project in December 2006, progress in scanning with the current equipment (HP ScanJet 5590) and limited staffing has been slow to date. There are plans to purchase a superior scanner to hasten the digitization progress. The institutional publications will in time become available in PDF format via a link on SAIAB's Information Portal, searchable by author, title and keyword

Alongside plans to broaden e-access to its rare books collection and its institutional publications, there is the prospect of a new digitization project which flows from SAIAB's participation in an African information sharing network since 2002.

SAIAB's proposed contribution to the Aquatic Commons

The Aquatic Commons repository was established by the International Association of Aquatic and Marine Science Libraries and Information Centres (IAMS LIC) in 2006. The Aquatic Commons is 'intended to facilitate the exchange of scientific research related to the marine/aquatic environments by providing a searchable, Web-accessible repository for digital documents', aimed particularly at promoting access to 'valuable traditional knowledge, local scientific information and government reports [that] exist throughout the developing world', but are not widely distributed (Fisheries and

Aquaculture Department, Food and Agriculture Organisation 2007). Further information is obtainable from <http://www.iamslc.org/index.php?section=147>.

Since 2002, the SAIAB Library has worked with the FAO Fisheries Library to establish a hub designed to enhance access to fisheries and aquaculture resources for researchers in Africa. The project has gone through various phases of information sharing and co-operation (Shaw and Collins 2006). Further contact through AFRIAMSLIC has increased potential for communication and co-operation. Much of the literature produced in Africa is in the form of research reports and reports to funding and development agencies. There is often important material that is not published in peer-reviewed literature and not indexed in conventional formats. At the AFRIAMSLIC conference at Accra in October 2005 it was proposed that the SAIAB Library should play a partnership role in the initiative to digitize freshwater African fisheries and aquaculture information. As SAIAB makes new contacts and research agreements with other partners elsewhere in Africa, it is vital for the SAIAB Library to be proactive to ensure that research reports are made accessible for digitization. The SAIAB Library hopes to build on its capacity and make a significant contribution of African aquatic and fisheries resource material to the Aquatic Commons.

In creating a web-based Information Portal during 2007, SAIAB has taken important steps towards broadening e-access to its resources. The SAIAB Library has been centrally involved in these developments.

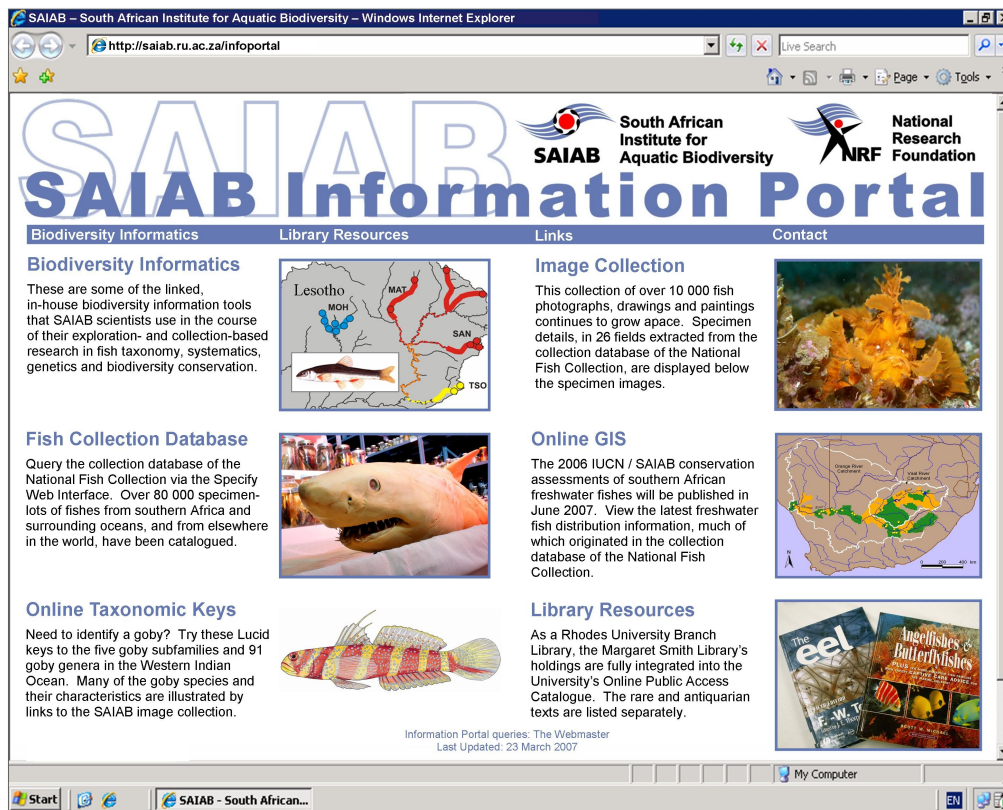
The SAIAB Information Portal

SAIAB's appointment of an information management specialist in 2006 was an important precondition for the development of the SAIAB Information Portal which was launched in March 2007 with the official opening of the new National Fish Collection Facility. Complementing the new building, SAIAB is giving new expression through the Information Portal to its mission to promote open access to its considerable resources, including those of the Margaret Smith Library. Willem Coetzer (2007a and 2007b) has recently provided an overview of the development of the Information Portal and this section of my paper draws on his writing, as well as the contributions of individual scientists at SAIAB who have been involved with the development of the Portal.

Online open access to digitized resources requires a web-based interface. During 2006-2007, the SAIAB Information Portal was designed as an integrated web-access tool. The SAIAB librarian was involved in decisions about design and content. As the information management specialist, Willem Coetzer, puts it, 'The web tools that constitute the SAIAB Information Portal are typical of websites that embrace the Web 2.0 philosophy. Instead of being isolated information silos or pages of impenetrable text, Web 2.0 websites are seen as sources of content and functionality: [computing platforms](#) that serve [web applications](#) to [end-users](#).' (2007a: 5) The Portal raises the profile of the SAIAB library and its resources as one of the six categories of this 'public window' into SAIAB's National Fish Collection and related resources. In addition to a link to the library, the Portal provides direct online access to the following resources:

- Fish Collection Database
- Image Collection
- Biodiversity Informatics
- Online GIS
- Online Taxonomic Keys

The Information Portal home page (<http://saiab.ru.ac.za/infoportal/>) is portrayed below:



The National Fish Collection, begun by JLB Smith in the 1940s, currently has about 80 000 lots of fish specimens (containing at least 650 000 individual fish specimens) from southern Africa and surrounding oceans, and from elsewhere in the world. As well as adult and larval specimens preserved in propanol and ethanol, the collection and associated material consists of preparations of genetic material, cleared and stained preparations, dry skins and skeletons, otoliths, X-rays, photographs, drawings and paintings of fishes. About 7500 species in about 400 families are represented in the collection, depending on which classification is used. An average of 2000 jars are added to the collection annually. SAIAB's is the largest of South Africa's three museum fish collections, the other two being the Iziko Museum in Cape Town and the Albany Museum, also in Grahamstown (Gon 2007).

The Fish Collection Database has been developed through a number of historical phases. The first began in 1986 with a Dbase III database, designed by Leonard Compagno, a senior scientist at the Institute. The information was migrated to Fish Net in 1992. This was a custom-designed system built on Advanced Pick Version 6, designed by Information Systems personnel at Rhodes University (Gon and Wertlen, 1996). From 2001, the Fish Collection began to be organised according to Specify, a database programme developed by the University of Kansas Natural History Museum and Biodiversity Research Centre. Specify is open access software, used by a number of Natural History Museums around the world to organise and manage their specimen collections. A major advantage of the Specify database software is that it uses a built-in web interface that used Java Server Pages (JSP) and generates a standard HTML template into which the newly added database text or image is inserted (Coetzer 2007a).

The Fish Collection search page is illustrated below:

The SAIAB Image Collection contains over 10 000 fish photographs, drawings and paintings. The web interface to the SAIAB Image Collection is designed in the same way as the Fish Collection, except that this application was built using ASP.NET (Microsoft's Active Server Pages add-on to the Internet Information Services web server software). One of the benefits of the web interface is that interested members of the public can submit their images to the Collection via the web interface. The online Image Collection is therefore dynamic and interactive, and fruitfully crosses the boundaries between professional research and public participation in gathering and storing images.

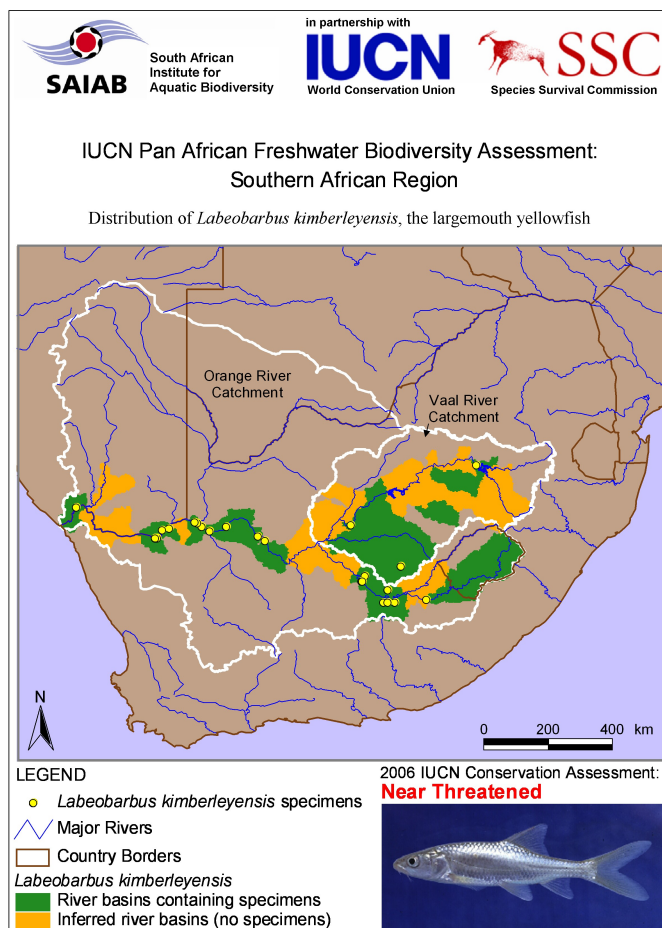
The Image Collection search page is illustrated below:

The emphasis on Biodiversity Informatics as a third set of resources in the Information Portal places SAIAB firmly in the worldwide trend of highlighting the importance of biodiversity in our ecologically fragile and connected world. The purpose of this emphasis in the Information Portal is to make structured scientific information about biodiversity available on the internet, communicating the specific resources developed by SAIAB as a biodiversity research institute.

SAIAB is a node of the South African Biodiversity Information Facility (SABIF) (<http://www.sabif.ac.za>), the local chapter of the Global Biodiversity Information Facility (GBIF) (<http://www.gbif.org>).

The Online GIS component of the SAIAB Information Portal provides freshwater fish distribution patterns and data. This GIS project of 2006 was a joint one with the World Conservation Union (IUCN) and other South African scientists to analyse biodiversity information about the conservations status of all southern African's freshwater fish and other freshwater species. More than 50 000 fish specimen records were plotted on maps and correlated with field knowledge of SAIAB scientists, who also categorised 354 freshwater fish species according to the threat of extinction. Much of the information came from the SAIAB National Fish Collection and the Albany Museum in Grahamstown. (Coetzer 2007b).

Here is an example of a distribution map generated during the course of the 2006 IUCN / SAIAB freshwater conservation assessment project:



The fifth component of the Information Portal contains a limited number of online taxonomic keys. Traditionally these have been published in hardcopy formats. An example of an online key used on the Information Portal is the Orange River Fishes Online Taxonomic Key. This key was adapted by Roger Bills of SAIAB, from a key originally written by Paul Skelton. The key was transcribed, with permission, into a Lucid key (<http://www.lucidcentral.org/>) by Willem Coetzer.

Implications for the role of the librarian

The exciting development of the SAIAB Information Portal highlights the need for continuing training and development of the SAIAB librarian in the field of information literacy. Participation in the development of the Information Portal has provided exposure to information systems and web design. These developments have highlighted the need for the SAIAB librarian to be better equipped to assist researchers use all six aspects of the portal, not just the library resources. The librarian will need to develop and apply knowledge of Specify, GIS and other specialisations to assist researchers with guided information navigation. In addition to the traditional custodian role, the librarian needs to become better equipped – a continuing process – to navigate the ‘data deluge’ and promote information literacy (Parker 2005, Valiela & Martinetto 2005, Gabaldón and Replinger 2006, Carlson 2006, Peters 2007).

Information literacy is not only a pre-requisite for effective and informed research; it is a vital pre-requisite for citizens to create new knowledge and participate in today’s information-intensive societies. As Bundy (2004) puts it, people who are information literate are ‘able to recognise their need for information, and then able to identify, locate, access and synthesise, evaluate and apply the needed information.’ Information literacy is vital for lifelong learning.

Conclusion

The South African Institute of Aquatic Biodiversity is a significant national research organisation and natural history museum, which has a long history since the 1940s of promoting research, contact and networking in sub-Saharan Africa. Alongside its substantial access to e-resources via Rhodes University, the SAIAB Library is taking concrete steps to broaden access to its rare book collection and the substantial collection of SAIAB’s institutional publications. In addition, there is SAIAB’s proposed partnership role in the initiative to digitize freshwater African fisheries and aquaculture information, and to contribute this and other African material to the IAMSLIC Aquatic Commons. The creation of SAIAB’s web-based Information Portal during 2006-7 has added further dimensions to the librarian’s role in the organisation, categorisation, design and navigation of electronic resources. The broadening of e-access to resources at SAIAB, including those of the Margaret Smith Library, requires a diversification of librarianship skills and training in the promotion of information literacy.

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