

**CODESRIA Conference on Electronic Publishing and Dissemination: 1<sup>st</sup> to 2<sup>nd</sup>  
September 2004 Dakar, Senegal.**

**Online access to the research output from and about Africa through Database aggregation and full text linking.**

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1. Background

Traditionally the main information resources and bibliographic databases available to and used by researchers, librarians and students in Africa are the same as those used in Europe and America. This information does not adequately reflect the research output of Africa and is not always relevant or appropriate. Although access to world information resources is essential; equally important is access to the local research output from the continent.

2. NISC

Realising a need in Africa for indigenous information and a local service, National Inquiry Services Centre Pty Ltd (NISC SA) opened in Grahamstown, South Africa in May 1995. NISC SA is an independent company affiliated to NISC International, Inc. in Baltimore, USA and to NISC Export Services Pvt. Ltd in Hyderabad India (NES).

NISC in South Africa is an academic journal and bibliographic database publishing company whose mission is to promote the publications and research output of Africa, within Africa and to the wider world. NISC has worked to achieve this aim by building bibliographic databases, sourcing and licensing relevant databases worldwide, and compiling and publishing database aggregations on the Internet, CD-ROM and recently also on DVD. NISC journals are available in print and online on Ingenta <http://www.ingentaselect.com> and full text reprints are available through African Journals Online at <http://www.ajol.info>.

3. Challenges of Electronic Publishing

Electronic publishing is a specialised business and requires continual software development to manage the changing technology, new hardware and new developments that arise. Each NISC has a software development team. Today the largest of these is that of NES in India. They maintain and develop such things as the search engine software and developments to promote full text linking from databases to online publications, and ensure that NISC stays abreast of new innovations in electronic publishing and is able to maintain the access no matter how the technology changes. NISC SA has invested in the development of data capture

software with built in intelligence and data validation to ensure quality database compilation. NISC SA has also been able to benefit from the software development of our publishing partners.

#### 4. Database Aggregation

In many subject fields there is no single database source for information and this applies particularly in Africa and particularly in specialist subject fields where there is a need to ensure African coverage. In our experience no database can in honesty claim to be comprehensive in coverage. To address this problem NISC compiles database aggregations and has developed software to integrate large and small databases to a single information resource. Related databases are combined and the combinations may span geography and time. Related databases with different aims and varying sizes can also be combined. The combinations enrich the information resource often offering different facets to the information and even differing points of view on the same article. Users of one database will benefit from exposure to all the databases. Each database has the opportunity to update their information quarterly and new databases can be added as they become available at the time of update.

When combining different databases there is inevitably overlap in the records and references which they contain. To prevent tedious repetitions NISC has developed Composite record building technology to limit duplication. Using fuzzy logic and our custom-developed duplicate detection software, duplicates are identified. Composite records are then compiled by combining the duplicates into a single record which retains all unique contributions from each database. Nothing is lost and the resulting records can be seen as value-added references retaining all unique keywords and all original abstracts. Users of each database benefit from the different context in which the other database compilers work and the composite records are enriched by the variant choices of keywords allocated to the same article by the different database producers.

Not only do the added keywords enhance the information value of the composite record, but each keyword added provides potential for richer retrieval. Indexing of articles in database compilation is not an exact science, but is rather an art and very open to interpretation which is inevitably affected by the subject bias or speciality of the indexer's organisation. Suppose we take as an example an article describing predation on fish by birds. An indexer from a fisheries institute will detail the fisheries related information in the article, whereas the same article indexed by an ornithologist would concentrate on information relating to birds. By combining the two we benefit from both points of view.

It is always surprising how unique each database proves to be and how little overlap there is between the databases and how composite records are often fewer than expected. For example in African Studies out of a total of 756 500 records and 19 databases there are only 42 842 composite records made up of duplicates.

#### 5. Database Aggregations with African Content

NISC bibliographic database aggregations with African content are of two types: They are either subject specific databases where African information is incorporated with major European and/or American databases (See Table 1) or they consist of multi-topic databases all of whose references are African, or of particular African relevance (See Table 2).

NISC integrates African databases with those from the rest of the world (See Table 2) to build subject specialisations which cover the subject worldwide, yet also include comprehensive African coverage. Relevant titles here are ***Fish and Fisheries Worldwide*** and ***Aquatic Biology, Aquaculture and Fisheries Resources***, both of which incorporate the FISHLIT database; ***Water Resources Worldwide*** incorporating the WATERLIT database and ***Wildlife and Ecology Studies Worldwide*** which include the Afro Tropical BIRD database.

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**Table 1 NISC Specialist Subject Titles:  
Aggregations of African, European and American bibliographic databases**

Title	African Database	Records	Databases
<b>Aquatic Biology, Aquaculture &amp; Fisheries Resources</b>	FISHLIT	1,121 899	14
<b>Fish &amp; Fisheries Worldwide</b>	FISHLIT	381 100	10
<b>Water Resources Worldwide</b>	WATERLIT	500 000 5	
<b>Wildlife &amp; Ecology Studies Worldwide</b>	BIRD	520,000	8

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NISC's 'all African databases' include ***African Studies (AFRS)*** (See Fig 1), ***South African Studies (SAS)*** (See Fig 2), ***Africa-Wide NiPAD (NISC information, Publications & African Databases) (NiPAD)*** (See Fig 3) and ***African HealthLine (AHL)***, (See Table 2).

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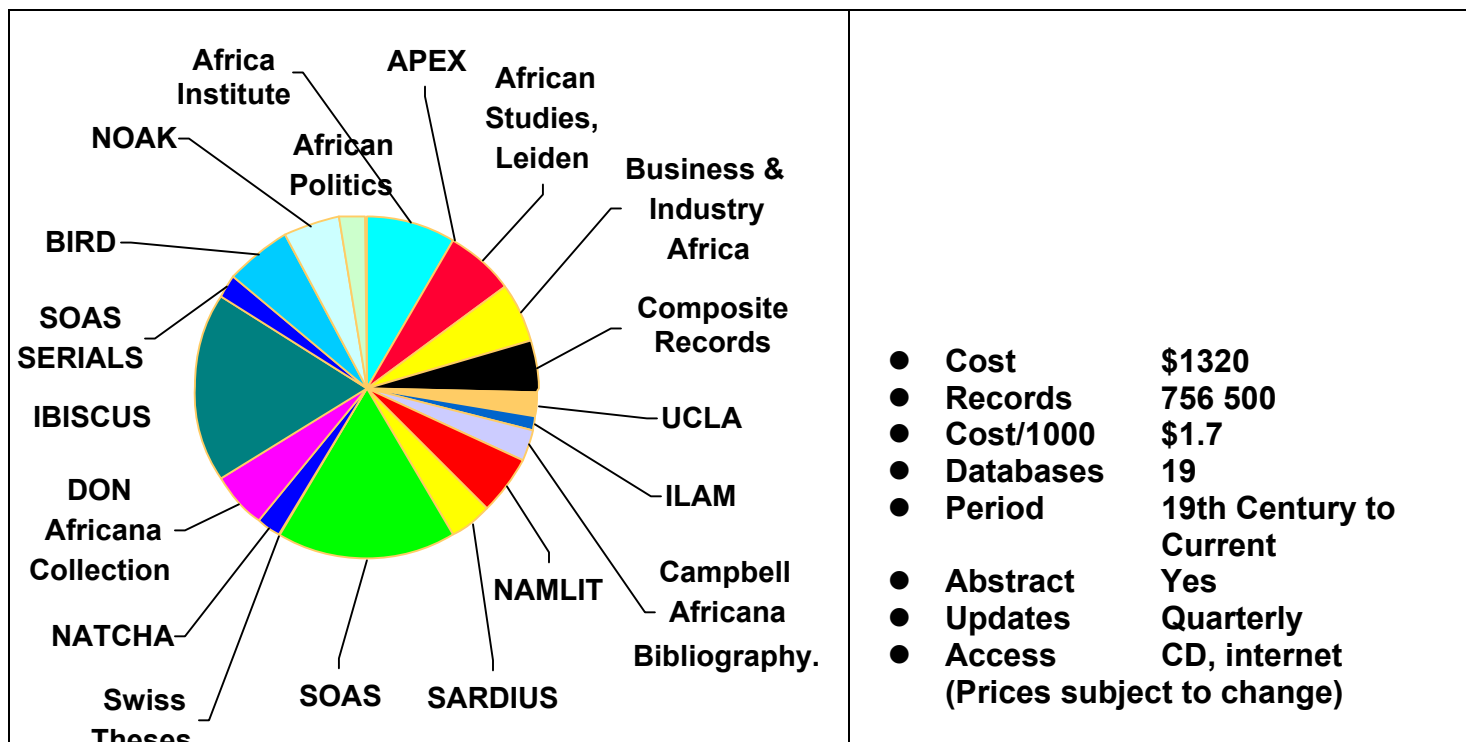
**Table 2 NISC African Titles:  
Aggregations of African and Africa-relevant bibliographic databases**

Title	Number of Records	Databases
• <b>African HealthLine</b>	641 200	14
• <b>African Studies</b>	756 500	19
• <b>South African Studies</b>	960 800	17
• <b>Africa-Wide, NiPAD</b>	almost 2 million	38 NEW

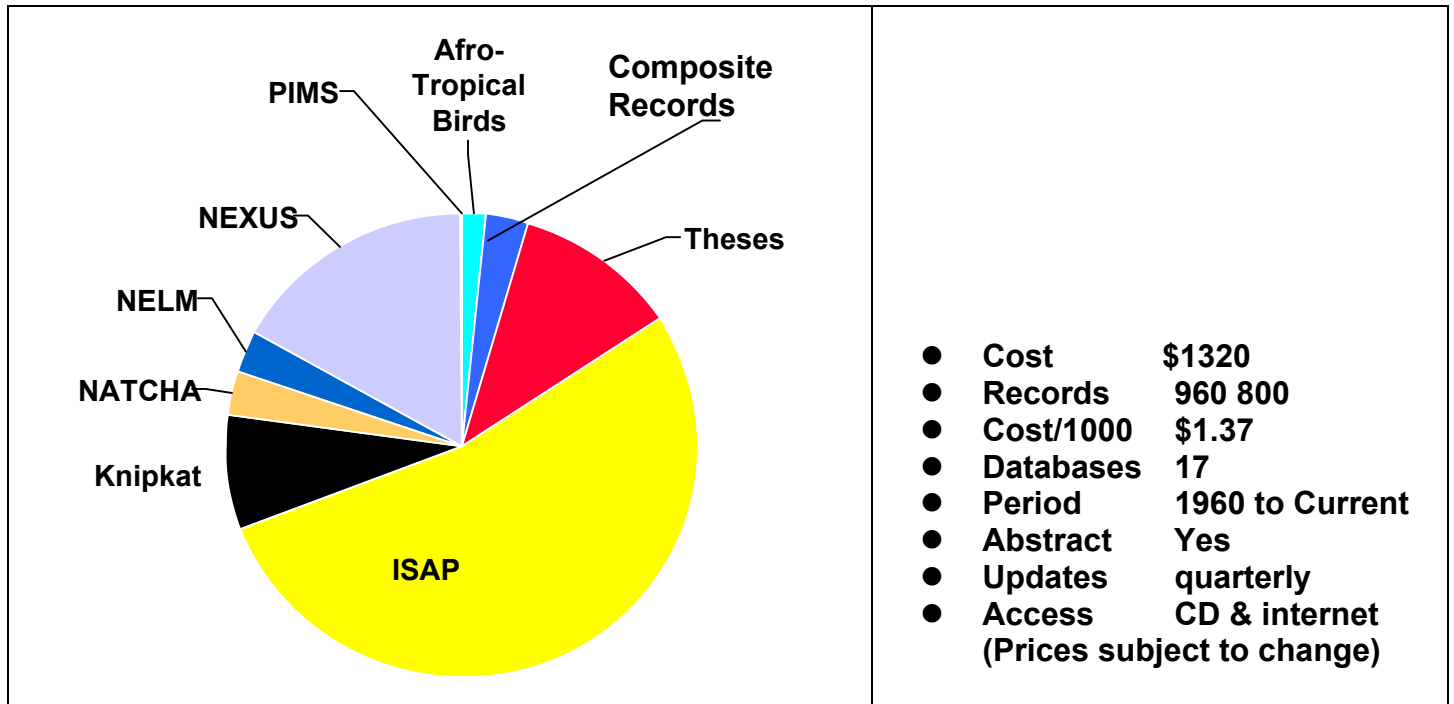
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In 2004 NISC released a new and important database aggregation: ***Africa-wide NiPAD (NISC information Publications and African Databases)*** (See Fig 3). ***NiPAD*** was compiled by combining the databases of our existing products ***African Studies*** (See Fig 1) with ***South African Studies databases*** (See Fig 2). New databases were added, and duplicates converted to composite records. The result is a most comprehensive African information resource. Details of the databases included in this collection are listed in Appendix 1 and the relative proportions of the major databases are shown graphically in Figs 1 and 2.

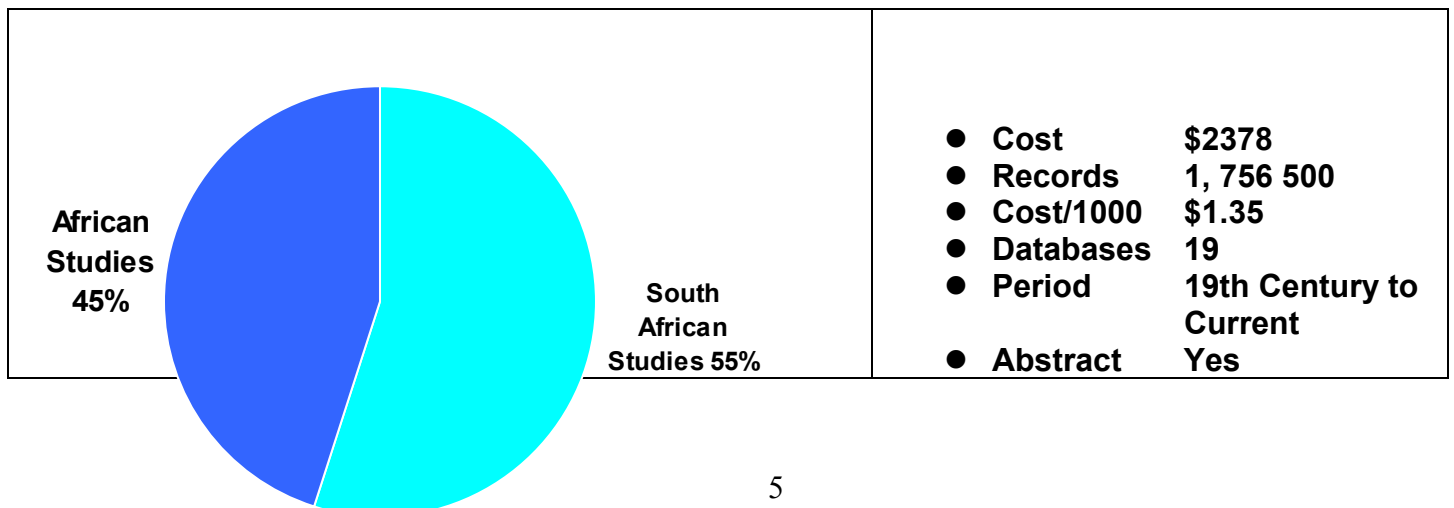
**Fig 1 African Studies**  
**African Multi-disciplinary Information: Social and Natural Sciences, History, Politics, and Law, Economics, Development and More**



**Fig 2 South African Studies (SAS)**  
**Access to Published South African Documents, Journal Articles, Books, Theses and Current Research**



**Fig 3 Africa-Wide NiPAD = SAS + AFRS.**  
**Database contributions from African Studies (AFRS) (45%) and South African Studies (SAS) (55%)**



- |  |   |
|--|---|
|  | <ul style="list-style-type: none"> <li>● <b>Updates</b>      <b>quarterly</b></li> <li>● <b>Access</b>        <b>Internet</b></li> </ul> <p><b>(Prices subject to change)</b></p> |
|--|---|

NiPAD is a collection of close to 40 databases and almost 2 million records, integrated together for the first time. NiPAD offers unprecedented access to information on all aspects of African research. Databases include information from books, journal articles, theses, reports, grey literature, pamphlets and more. Databases are sourced from Africa, Europe and the USA. There are too many databases in NiPAD for a graphic illustration, but Fig 3 shows that 45% of the records are contributed from African Studies and 55% are from the South African Studies collection. The relative contributions of the different databases are graphically illustrated Figs 1 and 2. In this paper this database collection on NiPAD will be used to demonstrate the techniques used by NISC to serve information retrieval and dissemination.

## 6. Search and retrieval software and features

NISC has developed an intelligent, powerful, user friendly search interface and, by using the power of the internet. NISC offers links from citations and abstracts to the full text, at the click of a button.

On BiblioLine a user can search all databases simultaneously, or choose one, or a selection of databases. This is another example of the power, functionality and flexibility of database aggregation.

Online searches are made on the NISC BiblioLine service. Search levels include BiblioLine Basic and BiblioLine Pro, and the choice of Quick, Advanced and Expert search caters for the different needs and levels of search requirements. A search strategy will be carried from one search level to another.

With database aggregation, comes variation between databases in spelling conventions and keyword choices. NISC has developed PIC Variant Searching to address this. When doing a search, variants of words are automatically searched including Plurals, International Spelling Variants and the variations in Compound words. Type one and all will be retrieved. This is a valuable feature when, for example, Americans are using databases with English spelling and visa versa. It is also helpful for second language English speakers and novice searchers. As an example; type fibre glass and retrieve glassfiber, fiber-glass, fibre glasses, glass-fibers etc. To help with difficulties experienced with Author names NISC has introduced a 'sounds like' option. This feature can be switched off if not required.

A help box pops up highlighting miss-spellings and suggesting assistance with searches that have zero results. Tips for searching are offered. The search term and its variants are highlighted in the retrieved references so that the reason for retrieval is clear. Relevant tips for searching are indicated when required.

## 7. Retrieved Records

The retrieved records: references or 'hits' are listed in publication date order, but can be sorted almost instantly by such things as author, journal, and language.

If related words appear in the references these can be clicked on and the new word can be added to the search strategy and new references can be located by doing a lateral search and new records added to those already retrieved.

Reference lists can be produced so easily using marked records from the list. Records can also be ranked by relevance as an option. There is often a feature to view new records since the last update using a saved search strategy. The records can be viewed, displayed, printed or downloaded as a short reference to indicate retrieval success, a basic bibliographic reference or with all keywords and with or without abstracts.

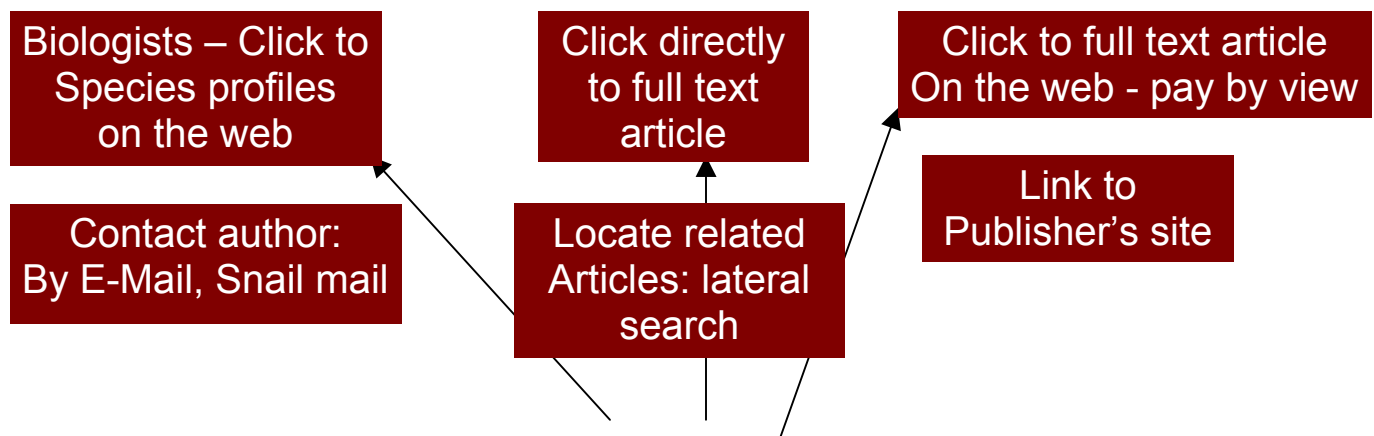
New downloading functionality for BiblioLine subscribers includes e-mailing results to a friend or the librarian, printing results, saving results to a file and exporting results to Database Managers for example ProCite, Reference Manager and EndNote.

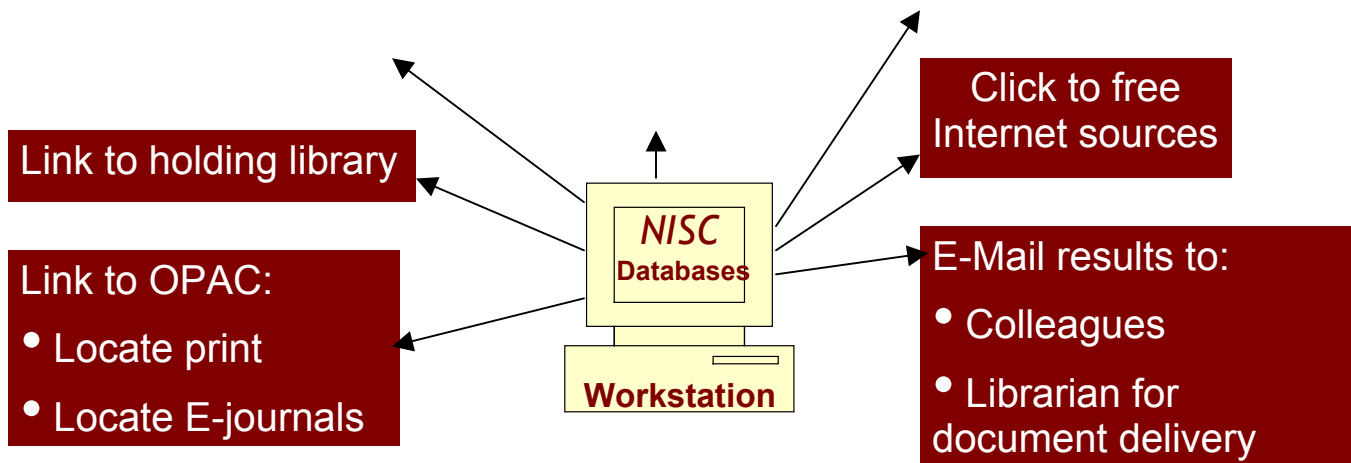
## 8. Full text location and Full text linking

Bibliographic databases are a powerful tool for the location of relevant full text articles pertaining to a particular information need. **The combination of well indexed databases and a well crafted search strategy will retrieve simply and efficiently the exact references required.** The relevant selection is made at the time of the search from what can often be a massive collection of records.

With the proliferation of online publications the value of bibliographic databases remains as a way of locating and accessing exactly the publications required, from whichever online site they are located. There is now the extra functionality of direct linking to the online article from a selection box which gives a choice of options from online vendors or publisher's web sites or freely available publications (See Fig 4). The database record will indicate as far as possible whether articles are only available in print, and locality, or whether they are to be found freely on the internet or in a journal aggregation where subscription payment is required.

**Fig 4 Bibliographic Databases embed the links; full text is a click away**





**Database linking functionality is the key:  
Locate relevant documents for sound research**

There is a tendency to believe that online information is comprehensive and all embracing. Powerful as online information is, it as yet offers part of what is available, and much of the publication record is still only available in print. This is particularly true in Africa and very important for the serious researcher. NISC databases offer many routes to the published record in full text and uniquely combine access to both print and online, wherever it is.

Researchers and librarians use a variety of different routes to the ultimate full text and NISC endeavours to offer access through a variety of access points. NISC is actively promoting ways to retrieve the full-text from the database collections through sophisticated, fast and efficient full-text linking, inclusion of authors' addresses and e-mails, holding libraries and purchase options.

Full-text linking from NISC records on BiblioLine to the full-text article directly can be far more efficient than searching the Internet to find the information online. No journal aggregator has comprehensive journal coverage and there is a need to index the aggregators. Importantly there are links to free full-text and related web pages. Nevertheless much access to the peer reviewed literature, so essential for researchers, depends on journal subscriptions and a journal aggregator and vendor. NISC has linking agreements with commercial vendors such as BioOne, Blackwell Synergy, EBSCOhost Electronic Journals Service, HighWire, IDEAL, Ingenta, JSTOR, Project MUSE, PsycARTICLES, Springer-Verlag, SwetsWise and more. These journal aggregators offer fee-based full-text services. NISC will customise the links to suit the client.

NISC also works with Open URL services such as LinkFinder Plus from Endeavor, SFX from ExLibris and 1-CATE of Openly Informatics which access the full-text vendor, your library catalogue, OPACs or other interlibrary loan services.

In NISC biological databases we offer species linking, by scientific name from the indexed record to full text species accounts on such publications as Walker's Mammals and FishBase. NISC biological products such as Fish and Fisheries Worldwide and Wildlife and Ecology Studies Worldwide make powerful use of this facility

### 9. Usage Statistics (See Table 3 and Fig 5)

Information databases are expensive, and librarians need to monitor their use. Usage statistics are helpful here. NISC gathers useful statistics (See Table 3). NISC has fully COUNTER compliant statistics.

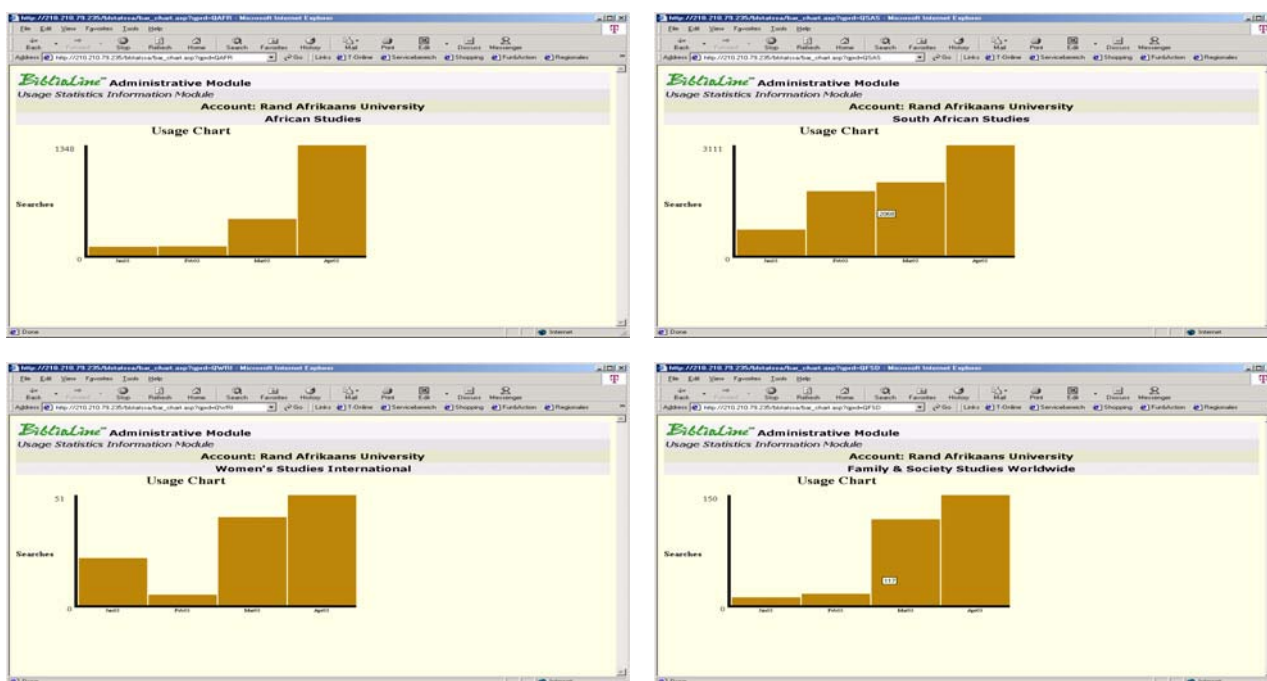
**Table 3 Example of Usage Statistics  
(Rand Afrikaans University January to May 2003)**

Note: click the database name to display a usage bar chart.

Database	Sessions	Searches	Search Hits	Records Displayed	Email/Export Save/Print	Turnaways Since 9-Feb-03
<a href="#">African Studies</a> Start Date: 9-Jul-02 End Date: 21-Apr-03	594	2,027	3,010,700	48,957	2,099	4
<a href="#">AIDSearch (MEDLINE AIDS/HIV Subset, AIDSTRIALS &amp; AIDSDRUGS)</a> Start Date: Free	6	55	3,835	958	0	0
<a href="#">Child Abuse, Child Welfare &amp; Adoption Database</a> Start Date: Free	1	1	0	0	0	0
<a href="#">Family &amp; Society Studies Worldwide</a> Start Date: 9-Jul-02 End Date: 21-Apr-03	116	294	1,099,199	7,716	103	0
<a href="#">South African Studies</a> Start Date: 9-Jul-02 End Date: 20-Jan-04	2,610	7,733	19,213,887	261,334	6,834	433
<a href="#">Women's Studies International</a> Start Date: 9-Jul-02 End Date: 6-Mar-04	55	119	168,843	5,168	289	6

From the usage patterns Librarians can identify databases which are being under-utilised and departments and research groups who need sensitisation to the resources and training in their use. In Fig 5 the impact of user training in the RAU Library in February is apparent with the ongoing noticeable increase in use in the following months. Usage stats also assist librarians in their choices of databases to purchase.

**Fig 5 Examples of monthly database usage bar charts , Rand Afrikaans University. January to May 2003**



## 10. Conclusion

There is a false impression that online publication is simple, straightforward and inexpensive. A publication produced in print stays with us in its original form accessible and understandable for 150 years and more. The same is not true for an electronic publication. Electronic publications are extremely vulnerable to technological change. Unless ported from the old to the new technology, from the old to the new hardware, from the old to the new operating system, from the old to the new storage medium and from the old to the new publishing platform, they become lost, locked up in an old technology unsupported by the latest modern hardware and software in common use. In the past two decades and into the future these challenges of change provide a real threat to the accessibility and archiving of electronic publications.

Each database is unique and special in its own way, but it is only by combining a multitude of sources that we can begin to attempt comprehensive coverage of African output. This approach can be likened to the stitching together of patches to eventually provide the coverage of a patchwork quilt. Such a task is never complete and each database is regularly updated and new databases are added at the quarterly update as they become available. The publication record for this continent is a precious resource documenting as it does, our cultures, history, and natural and economic resources and we need to conserve this and maintain access to the valuable published record for future generations. Free flow of information can help understanding and promote a peaceful world. By building on the work of others we can move forward and hope to avoid repeating previous mistakes or re-working what has been done before.

## Appendix 1

### Details of Databases included in the Bibliographic Database Aggregation Africa-Wide: NiPAD.

NiPAD, (NISC information, Publications and African Databases), is designed to support the information source for NEPAD, the New Partnership for Africa's Development.

#### PRODUCT OVERVIEW

**Africa-Wide: NiPAD** is a combination of two of NISC SA's most well-known and popular database collections: **South African Studies** and **African Studies**. All you need to know about Africa is now on one database. NISC will be adding new databases to this unique collection making it indispensable for those with an interest in Africa. Duplicate Detection Software developed by NISC will limit duplicate citations being retrieved.

**Total Records:** Over 1 734 514

**Dates of Coverage:** 19th Century to current

**Formats:** BIBLIOLINE

**Update Frequency:** Quarterly

#### AFRICAN STUDIES

African Studies includes almost a million records from databases from Africa, Europe and the United States providing access to multi-disciplinary information on Africa.

#### SOUTH AFRICAN STUDIES

South African Studies includes over a million records providing access to the great majority of documents published in and about South Africa.

#### DATABASE Content

##### Databases also on African Studies:

##### **NOAK (Nordic Africa Institute Online Catalogue)**

Records: 49 496

The NOAK database contains literature on modern Africa and covers the entire continent with an emphasis on contemporary history, politics, education, economics and other social sciences as well as African fiction. Language coverage is English, French, German, Portuguese and the Nordic languages. The records are indexed using English terms mainly derived from the Macro thesaurus for Information Processing in the Field of Economic and Social Development.

##### **IBISCUS (1970 to 2002)**

Records: 156 808

This database is built by a group of compilers in 19 countries, with 54 input centres in Africa, Europe and Canada. It contains development-related information on Francophone Africa. Subjects covered include agriculture, health, economics, transport, environment and society.

### **African Studies Abstracts (19th Century to current)**

Records: 62 157

The African Studies Centre in Leiden compiles ASA. It has been combined with the African Studies Centre's library catalogue of books and periodicals. Specialist library and documentation staff from the African Studies Centre have compiled the database. It offers coverage of social, economic and development issues, religion, law, education, modern history and more.

### **Africa Institute Database (1981 to current)**

Records: 78 193

The Africa Institute based in Pretoria publishes this database. It is an independent, non-profit organisation which has been described as the "Best in Africa, on Africa under one roof". Its subject coverage includes, political, socio-economic, international and development issues facing contemporary Africa.

### **The Southern African Database (Sardius) (1961 to 1997)**

Records: 32 312

Staff at the Jan Smuts House Library in Johannesburg have compiled this database. Coverage includes political, economic and social research in the SADC region with information on leaders, conflict and conflict resolution, reform, development and foreign relations.

### **School of Oriental & African Studies (SOAS) Library Catalogue: Africa (1989 to current)**

Records: 190 318

This is one of the largest and most important library collections of Africana materials in the world. The database covers the continent of Africa, in European and African languages. Topics range from art and architecture, to social and political issues, to economics and law. It also includes the complete list of SOAS serial holdings.

### **NAMLIT (19th century to current)**

Records: 50 209

The National Library of Namibia compiles this database which includes a comprehensive bibliography of Namibia-related library materials both from Namibia and from abroad.

### **Business & Industry: Africa (1994 to current)**

Records: 11 036

This database includes full-text within the record display. Its function is to index the facts, figures and key events of companies, industries and markets based in Africa as they influence the region and the rest of the world and the influence of the rest of the world on the African continent.

### **Natural and Cultural Heritage of Africa (NATCHA) (1960 to current)**

Records: 29 005

NISC SA in collaboration with the Naturalist Niche in Port Elizabeth compile this database. It offers unique current and historical coverage of articles from natural history, zoology, botany and museum journals published in Africa and relating to the continent.

### **Afro-Tropical Bird Information Retrieval Database (20th Century to current)**

Records: 73 202

NISC SA compiles this database in collaboration with the Percy FitzPatrick Institute of African Ornithology at the University of Cape Town. It offers comprehensive current and historical coverage of all publications on Afro-Tropical Birds. It also includes some information from the 1800's.

### **African Periodicals Exhibit (APEX)**

Records: 135

The catalogue is published annually by the African Academy of Sciences in Kenya and sponsored by the Southern African Book Development Education Trust (SABDET), in the UK. APEX lists details of 135 scholarly African serial publications.

### **Bibliography on Contemporary African Politics and Development (1981 to 1992)**

Records: 21 583

This bibliographic database was produced at the University of California, Los Angeles (UCLA). It is keyword indexed in detail, all the citations are annotated and over half include abstracts. It is derived from both English and French speaking Africa and the database also references illustrations and maps.

### **Don Africana Collection (16<sup>th</sup> Century to current)**

Records: 47 281

This includes David Don's original collection of documents donated in 1916. It has been updated constantly since then and relates to Africa south of the Sahara. Subjects covered include African religion, archaeology, art, economics, education, exploration, flora and fauna, geography, history, law, literature, missionary accounts and politics.

### **The Campbell Collections of the University of Natal, Killie Campbell Africana Library (19<sup>th</sup> Century to current)**

Records: 29 291

This collection includes a wide range of published works and an extensive manuscript collection dealing with Southern Africa in general and the Kwa-Zulu Natal Region in particular. Subjects covered include politics, cultural anthropology, African art and 19<sup>th</sup> and 20<sup>th</sup> century history. The collection includes important published accounts left by 18th and 19th century explorers and travelers in Africa, as well as Zulu dictionaries, grammar books and published works by early Zulu writers. Highlights include, early South African English literature, the James Stuart Papers, the Bourquin Papers and accounts and diaries of the Anglo-Zulu War.

### **International Library of African Music (ILAM)**

Records: 8 021

This collection includes recordings and publications from the early 20<sup>th</sup> century to current. This database includes annotated records pertaining to indigenous African music in the ILAM collection. The regions covered are central, eastern and southern Africa. Soon to be added is the database of musical instruments and photographs. To obtain musical recordings contact: International Library of African Music (ILAM), Rhodes University, Grahamstown, 6140, South

Africa, e-mail:ilam@ru.ac.za, Tel:+27(46)603-8557 and Fax:+27(46)622-4411.

**Database of Swiss Theses and Dissertation (1897 to current)**

Records: 570

This database is compiled by Roger Pfister and is a bibliography that lists Swiss doctoral dissertations on Sub-Saharan Africa.

***NEW to this database collection:***

**Africana Books Collective**

Records: 1 050

ABC is a non-profit organisation acting as a supply agent for 45 publishers in 11 countries. This database offers information on nearly 2 000 books by African authors, published in Africa. Hotlinks enable the user to order books directly from ABC.

**The Africa Book Centre**

Records: 268

This database provides libraries and individual buyers access to books from and about Africa published by 1,000 suppliers from Africa and all around the world. The Africa Book Centre's Book Review is the best source of current information on the African book industry, carrying information on authors, booksellers, censorship, human rights and publishing. E-mail access is offered to facilitate purchase.

**Databases from South African Studies**

**Index to South African Periodicals (1987 to current)**

Records: 432 061

This database is compiled by the South African State Library. Topics covered include scientific and technical articles, law, education, agriculture and municipal affairs.

**South African National Bibliography (1988 to current)**

Records: 74 884

This is a comprehensive record of South African publishing compiled by The national Library of South Africa.

**National English Literary Museum (1990 to current)**

Includes six databases:

§ Select Index to South African Literature in English, Critical Writings (27 072 records)

§ Select Index to South African Literature in English, Creative Writings (139 199 records)

§ NELM – Main Catalogue (18 116 records)

§ Manuscripts (34 464 records)

§ Literary Awards (1 721 records)

§ A Bibliography of Anglophone Literature and Literary Criticism by Black South Africans (7 898 records)

**KnipKat**

Records: 68 131

This database is from the Nasionale Afrikaanse Letterkunde Museum en Navorsingsentrum (NALN). It is the indexed database of press cuttings from newspapers and magazines relating to Afrikaans language, literature and culture with information about writers of the Afrikaans language.

**NEXUS**

Records: 135 375

The Database on Current and Completed Research in South Africa is compiled by the National Research Foundation (NRF) in Pretoria. This database provides information on approximately 135 900 South African current and completed research projects including theses and dissertations. The records of the Union Catalogue of Theses and Dissertations (UCTD) formerly maintained by the Library of the Potchefstroom University are now included. This source provides information on all fields of science since 1900. It also includes abstracts.

**Witwatersrand University Management Research Reports (1970 to current)**

Records: 1 782

The Witwatersrand Library of Management database contains records on management in South Africa.

**The Centre for Rural Legal Studies Database (1987 and earlier to current)**

Records: 5 172

Subject coverage includes issues relating to agriculture and farm workers in South Africa and elsewhere, specifically labour law and relations, working conditions, housing/tenure and socio-economic conditions. Issues such as land reform, rural local government and gender are also covered.

**South African Legal Abbreviations**

Records: 1 624

This database of abbreviations is compiled by the law librarians at the UNISA Law Library. This collection is important as there is no standardisation with respect to abbreviations used in law in South Africa.

**Political Information and Monitoring Service Database (PIMS)**

Records: 575

This database is compiled by IDASA, the Institute for Democracy in South Africa and offers comprehensive, plain language summaries and key details to the bills, acts and amendments of South African Parliament.

**Coming Soon:**

### **The Bibliographic database of the Dictionary Unit for South African English**

The Unit was established in 1969 to collect and record English as it is used in South Africa. Examples of South African English have been identified in publications and the references collected were first recorded on index cards and then in electronic format. New records from a variety of sources are being added and, over time, the thousands of index cards will be scanned or keyed into the database. This material provides the reference collection used by the Unit when writing dictionaries but can also be used as a general research tool.