

OECD Global Science Forum

The Scientific Collections initiative: SciColl Progress Report to the 21st meeting of the Global Science Forum

Richard Lane,
Chair, Scientific Collections Steering Committee
(Natural History Museum, London, UK)

An update on progress in planning for an international coordinating mechanism for scientific collections, named Scientific Collections International (SciColl), is presented. The OECD Global Science Forum is asked to comment specifically on the proposed:

1. Strategic plan, including the work plan focussing on collection elements that can contribute to understanding changing environments
2. Governance and management
3. Budget and mechanism for funding the start-up phase

Background

Scientific collections of samples and objects are fundamental components of our scientific infrastructure. They consist of carefully selected samples of the world around us which allow us to verify or repeat earlier scientific experiments and observations and through new technologies re-examine the samples to make new discoveries. The fact that the samples in scientific collections are arranged in particular ways means that they are both a reference system of existing information as well as a source of new knowledge and ideas. The challenge is to ensure that this distributed infrastructure is arrayed, or connected, to serve the needs of science and society.

The initial proposal for an activity on scientific collections was introduced by the Dutch delegation at GSF-14 (Feb. 2006). This was followed by technical workshops in Leiden (June 2007) and Washington DC (July 2008). At the October 2008 GSF meeting approval was given for an 18 month planning period during which governance and sustainability of an international coordinating mechanism should be explored together with encouragement to expand disciplinary and international participation. The UK undertook to foster the planning phase. A report on progress was given to the GSF in April 2009 immediately following a meeting of the steering committee in London in March 2009.

This initiative aims to build an international coordinating mechanism for scientific collections with two primary goals: to ensure collections are efficient and integrated infrastructures and to enable more science to be done, especially interdisciplinary research using collections.

Progress since the last update

Progress has been along four lines since the last update to the GSF in April 2009.

1. Strategic planning (chair: Dr David Schindel, Smithsonian Institution, USA)
2. Governance and financial planning (Chair: Dr Christoph Häuser, Museum für Naturkunde, Berlin)
3. Outreach (Chair: Dr Myriam Néchad, Muséum National d'Histoire Naturelle, Paris).

It should be noted that in addition to work on the proposed functioning of the initiative itself, steps have been taken to broaden the involvement of countries beyond the OECD. This was significantly achieved in the most recent steering committee meeting in Berlin (see below).

The governance and financial planning working group had a workshop in London in May 2009 and the chairs of the three working groups have a monthly teleconference (including the GSF secretariat) to monitor progress.

A meeting of the full steering committee together with invited participants from non-OECD countries was held in Berlin in September 2009, hosted by the Museum für Naturkunde and generously funded by the Bundesministerium für Bildung und Forschung (BMBF). Thirty four participants from over 20 countries attended (Annexe 1) and reviewed the draft strategic plan, proposed governance and financial plan and the outreach activities.

Strategic planning

The rationale of the proposed international coordinating mechanism for scientific collections, now called SciColl, is given in detail in the attached Annexe 2.

The mission of SciColl is to

- help scientific collections and their host institutions increase their effectiveness and the return on investment in the long-term management of collections
- catalyse ground-breaking interdisciplinary research that relies on access to scientific collections and their associated information.

SciColl will pursue this mission by:

- Providing an international coordinating mechanism that will enable and energise collaborations across the scientific disciplines that rely on object-based scientific collections, including but not limited to anthropology, archaeology, biology, biomedicine, and the earth and space sciences;
- Identifying and opening up new and exciting areas of research that rely on scientific collections and their associated information distributed across disciplines and countries;
- Creating unprecedented access to collections and their associated information in different scientific disciplines;
- Increasing the impact that scientific collections and their associated information have on evidence-based policy development; and
- Raising the community standards of specimen curation, collection management, and the training of collection professionals.

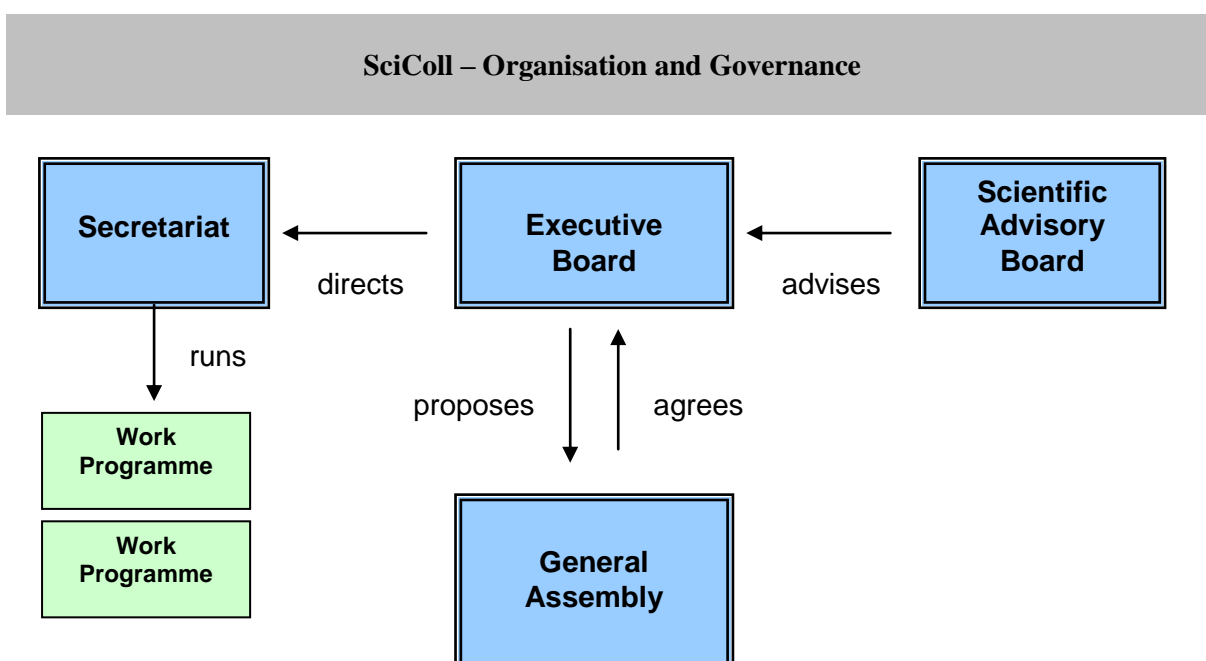
To ensure that SciColl delivers on its mission within the first 3-5 years, the steering committee proposes that, beside actions dedicated to management and collaborative issues, a major pilot project is undertaken to underline the role of scientific collections in global scientific research.

The current proposal would focus on global environment changes, and how scientific collections can contribute to our understanding and be made more widely available to the research community. Taking a timeline from changes over the past few years to thousands and millions of years will enable the widest possible engagement of the scientific community to address challenging scientific questions and policy relevant issues. For example, collections made over the past decade will give a valuable insight to the movement of invasive organisms in natural and agricultural environments as well as emerging diseases. Collections made within the last hundred years will demonstrate the movement of anthropogenic chemicals into the marine and terrestrial environments and within the

past 300 years the impact of human activity following the industrial and agricultural revolutions. Changes over longer time spans, the past few thousand years, will draw upon ice and sediment cores to give clear evidence of natural climate changes against which current changes can be calibrated. Deep time is explored through geological and palaeontological samples.

Governance and financial planning

The proposed governance model is given in detail in Annexe 3. Essentially, we propose a secretariat to coordinate and drive forwards the delivery of SciColl. The structure will be directed by an executive board elected by a general assembly of partner organisations (research and collections holding institutions, country representatives and international organisations).



The long-term funding structure for SciColl is that of a self supporting membership organisation. However, it is proposed that there should be a start-up phase of three years during which financial support is drawn mainly, (but by no means exclusively), from country contributions. This will allow SciColl to start its activities while efforts are made to attract a critical number of supporting institutions. To complement this approach, for the first three years the executive board will be drawn primarily from country representatives to ensure that SciColl meets policy needs as well as the needs of collection holding institutions.

The proposed budget for SciColl, including the secretariat and associated work programmes is given in the table below (in k€). Details are given in Annexe 4 (table 1).

	Year 1	Year 2	Year 3	Year 4
Secretariat	289	392	392	396
Committees, etc	80	80	80	80
Work Programme	60	205	290	290
Total	509	757	842	846

National contributions: As indicated above, it is proposed that for the first three years SciColl will need support primarily from country contributions. It is proposed that national contributions are based on Gross Expenditure for Research & Development (GERD) in which four categories are proposed (see annexe 3). A flexible mechanism will be set up for national contributions, allowing governments

or funding institutions to provide the necessary support to SciColl during its start-up phase either directly to the Secretariat, or via project funding. After three years it is anticipated that the country contributions will decrease to be replaced by individual institutional contributions as SciColl becomes a predominantly membership organisation, but with a continued input from national contributions. Membership income milestones will be set for the establishment and 'established' phase to ensure sustainability.

Institutional contributions: long-term sustainability of SciColl will be provided by contributions from individual institutions and, perhaps, international organisations. Proposed contributions are based on the size of the institutions (operational budget and staff number), the smallest organisations having the possibility to join via the establishment of consortium (Annexe 3).

Hosting the secretariat

It is anticipated that the secretariat will be hosted by an organisation that either holds major scientific collections or is involved in funding such organisations. The expectations of the host organisation are detailed in annexe 4, and follow the hosting requirements for the Global Earthquake Model (GEM) recently established by the OECD GSF. There will be a formal call for proposals to host the SciColl secretariat in 2010. To date, informal expressions of interest to host the secretariat have been received from the USA (Smithsonian Institution, Washington) and Germany (Berlin). A number of other institutions are still considering.

Outreach

One of the major issues at the present stage of the process is the engagement of the research community and reaching out all the interested stakeholders. The disciplinary scope and country participation (currently limited to OECD countries) have also to be expanded. Therefore, an international conference ("*International Coordination of Scientific Collections: a Global Research Infrastructure to Understand our Changing Environments*") is being organised, which will take place in Brussels 8th-9th February 2010. The goals of this conference are to:

- Raise awareness of the potential benefits to science and society of greater international and interdisciplinary coordination of scientific collections;
- Present and discuss the proposed SciColl mission, governance, and work programme;
- Discuss potential SciColl activities that will provide benefits to collections in the form of higher efficiency, standards based on best practices, and improved workforce training;
- Explore potential interdisciplinary research initiatives that rely on access to scientific collections;
- Participate in a Science Symposium that focuses on SciColl's 'pioneer' research initiative: "Collection-based Research on Global Change since the Dawn of Humanity"; and
- Disseminate information on the benefits and obligations of SciColl membership, and to encourage institutional membership in SciColl.

A contribution of 15,000 € to the costs of the Brussels conference has been obtained from the European Science Foundation.

Next steps:

A proposed timetable for the development of SciColl over the next 24 months is given below:

- End September 2009: provide a list of relevant institutions for SciColl membership and suggestions for potential invitees to SciColl outreach & planning conference (Feb. 2010)
- 5-6 October 2009: GSF autumn meeting (Krakow, Poland): SciColl update, including presentation of the agreed governance model (& budget), draft Strategic Plan / Programme of Work; obtain feedback from GSF / national delegations
- End October 2009: SciColl outreach brochure ready for distribution
- Late 2009: WG meeting(s) for planning Feb. 2010 conference on Work Programme (global project/product)
- End 2009: develop and open SciColl website
- End 2009: letter to directors of relevant institutions asking for indication of interest to join SciColl as institutional members (deadline for response: 1 May 2010)
- End 2009: final draft documents made available on SciColl website
- 8-9 February 2010: SciColl outreach & Work Programme planning conference (Brussels): *"International Coordination of Scientific Collections: a Global Research Infrastructure to Understand our Changing Environments"* (suggested title)
- 9 February afternoon, possibly 10th February 2010: SciColl Steering Committee meeting:
- February / early March 2010: prepare article(s) about SciColl for Nature, Science, New Scientist, The Economist, etc., for publication after conference.
- Mid March 2010: final documents (incl. Terms of Reference, Work Programme, etc.) to be submitted to GSF
- April 8-9, 2010: GSF spring meeting: ask for GSF endorsement of final proposal to establish SciColl
- May 2010: SciColl invitation to governments and institution to submit letters of intent to join SciColl
- May/June 2010: launch of request for proposals to host SciColl Secretariat
- July/August 2010: tipping point for letters of intent, if sufficient commitment establish Interim Executive Board
- October-November 2010: Selection of Secretariat Host
- Nov. 2010: Advertisement for post of SciColl Executive Director
- Early 2011: official launch of SciColl (establishment of Secretariat)

Annexe 1

**Participants to the SciColl steering committee meeting
Berlin, September 2-1, 2009**

Dr. Hala N. Barakat

Deputy Director
Center for Documentation of Cultural and
Natural Heritage - CULTNAT (Affiliated to
Bibliotheca Alexandrina)
Smart Village, Km 28 Cairo Alex rd
Giza, Egypt
halabarakat@mcib.gov.eg
halabarakat2002@yahoo.com
phone +20-2-35343030
fax +20-2-35392929

Profa. Dr. Claudia Carvalho

Departamento de Antropologia
Museu Nacional/UFRJ
Quinta da Boa Vista
20940-040 Rio de Janeiro - RJ, Brasil
claudiarcavvalho@uol.com.br
phone +55-21-25626935/6932

Jim Croft

Deputy Director, Science & Information
Australian National Botanic Gardens
GPO Box 1777
ACT 2601 Canberra, Australia
jim.croft@gmail.com
fax +61-2-62509 599

Bernd Fischer

Deputy Head, Division 211: Basic policy
issues of International and Multilateral
Cooperation
Federal Ministry of Education and Research
Hannoversche Straße 28-30
10115 Berlin, Germany
bernd.fischer@bmbf.bund.de
phone +49-30-18575068
fax +49-30-185785068

Prof. Dr. Uwe Fritz

Leitender Direktor Museum für Tierkunde
Senckenberg Naturhistorische Sammlungen
Dresden
Koenigsbruecker Landstr. 159
01109 Dresden, Germany
uwe.fritz@senckenberg.de
phone +49-351-89 26326
fax +49-351-89 26327

Dr. Patrick Grootaert

Head, Department of Entomology
Royal Belgian Institute of Natural Sciences
Vautierstreet, 29
1000 Brussels, Belgium
patrick.grootaert@natuurwetenschappen.be
phone: +32-2-6274302

Prof. Dr. Michel Guiraud

Director of Collections
Muséum National d'Histoire Naturelle
61 rue Buffon
75005 Paris, France
mguiraud@mnhn.fr
phone +33-1-40793524
fax +33-1-40793517

Dr. Christoph L. Häuser

The Directorate, Office for Project
Coordination, International Cooperation and
Science Policy
Museum für Naturkunde
Invalidenstr. 43
10115 Berlin, Germany
christoph.haeuser@mfn-berlin.de
phone +49-30-2093 8479
fax +49-30-2093 8561

Dr. Hans-Gerhard Husung

Staatssekretär
Senatsverwaltung für Bildung, Wissenschaft
und Forschung
Beuthstr. 6 - 8
10117 Berlin, Germany
hans-gerhard.husung@senbwf.berlin.de
phone +49-30-9026 7

Dr. Phyllis E. Johnson

Vice President for Research & Economic
Development
University of North Dakota
264 Centennial Drive, Stop 8367
ND 58202-8367 Grand Forks, United States
phyllisejohnson@mail.und.edu
phone +1-701-777-6736
fax +1-701-777-2193

Anna **Klyukina**, Ph.D.
Director
State Darwin Museum
Moscow, Russia
anna@darwin.museum.ru
phone +7-95-135 3376 or 134 6124
fax +7-95-135 3384

Prof. Dr. Leo M. **Kriegsman**
Head, Geology
National Museum of Natural History Naturalis
Darwinweg 2
2333 CR Leiden, Netherlands
kriegsman@naturalis.nnm.nl
phone +31-71-5687654
fax +31-71-5687666

Prof. Dr. Gerardo **Lamas**
Director
Museo de Historia Natural, Universidad
Nacional Mayor de San Marcos
Av. Arenales 1256, Apartado 14-0434
Lima-14, Peru
glamasm@unmsm.edu.pe;
paititia@yahoo.com
phone +511-471-0117, ext. 27
fax +511-265 6819

Dr. Richard **Lane**
Director of Science
The Natural History Museum
Cromwell Road
SW7 5BD London, United Kingdom
r.lane@nhm.ac.uk
phone +44-20 7942 5299
fax +44-20 7942 5765

Prof. Yeonhee **Lee**
Director General
Korea National Research Resources Center
#201 Annex Building
Seoul Women's University
126 Kongrundong, Nowongu
139-774 Seoul, Korea
yhlee@swu.ac.kr
phone +82-2-970-7881
fax +82-2-970-7882

Dr. Dongsin **Lee**
Director Department of Education and
Certification
Korea National Research Resources Center
#201 Annex Building
Seoul Women's University
126 Kongrundong, Nowongu
139-774 Seoul, Korea
dslee22@knrrc.or.kr
phone +82-2-970-7884
fax +82-2-970-7886

Prof. Dr. Reinhold R. **Leinfelder**
Director General
Museum für Naturkunde
Invalidenstr. 43
10115 Berlin, Germany
leinfelder@mfn-berlin.de
phone: +49-30-2093 8544
fax +49-30-2093 8561

Dr. Jorge M. **Lobo**
Vicedirector de Colecciones Biodiversidad y
Biología Evolutiva
Museo Nacional de Ciencias Naturales
José Gutiérrez Abascal, 2
28006 Madrid, Spain
mcnj117@mncn.csic.es
phone +34-91-4111326 ext 1145

Dr. Keiichi **Matsuura**
National Museum of Nature and Science
3-23-1 Hyakunin-cho, Shinjuku-ku
169-0073 Tokyo, Japan
matsuura@kahaku.go.jp
phone +81-3-5332-7167
fax +81-3-3364-7104

Dr. Fridthjof **Mehlum**
Research Director
Natural History Museum, University of Oslo
Sars' gate 1, Tøyen
0562 Oslo, Norway
fridthjof.mehlum@nhm.uio.no
phone +47 22851723
fax +47-22851837

Myriam **Nechad**
Head, International Affairs
Muséum National d'Histoire Naturelle
57, rue Cuvier, CP 24
75231 Paris cedex 05, France
nechad@mnhn.fr
phone +33-1-40793866
fax +33-1-40795759

Dr. Helida Oyieke
Director for Research and Collection
National Museums of Kenya
P.O. Box 40658-00100
Nairobi, Kenya
hoyieke@museums.or.ke
phone +254-20 3742445
fax +254-20 3741424

Prof. Dr. Fredrik Ronquist
Head, Department of Entomology
Swedish Museum of Natural History
Box 50007
10405 Stockholm, Sweden
fredrik.ronquist@nrm.se
phone +46-8-5195 4094

Dr. Michael Rottmann
Head, Division 725, System Earth
Federal Ministry of Education and Research
Heinemannstr. 2
53175 Bonn, Germany
michael.rottman@bmbf.bund.de
phone +49-228-9957 3661
fax +49-228-9957 83661

Dr. David Schindel
Smithsonian Institution
National Museum of Natural History
10th St. & Constitution Ave. NW
20560 Washington, D.C., United States
schindeld@si.edu
phone +1-202-633-0812
fax +1-202-633-2938

Dr. Frédéric Sgard
OECD Global Science Forum
2 rue André-Pascal
75775 Paris cedex 16, France
frederic.sgard@oecd.org
phone +33-1-45247809

Dr. M. Alma Solis
Research Leader
Systematic Entomology Lab., ARS, USDA
BARC-W, Bldg. 005, Rm. 133
Beltsville, M.D., 20705, United States
alma.solis@ars.usda.gov
phone +1-301-504-5183

Dr. David Smith
Director Biological Resources, CABI
World Federation of Culture Collections
(WFCC)
GBRCN Secretariat
Julius Kühn-Institut (JKI),
Institut für Pflanzenernährung und
Bodenkunde,
Bundesallee 50
38116 Braunschweig, Germany
d.smith@cabi.org
phone +49-531-596 2298

M.S. Piotr Szrek
Polish Geological Institute - National Research
Institute
4 Rakowiecka St.
00-975 Warszawa, Poland
pszr@pgi.gov.pl
phone +48-22-8495351 w. 419
fax +48-22-8495342

Heino von Meyer
Head, OECD Berlin Centre
Schumannstraße 10
10117 Berlin, Germany
phone +49-2888-353
fax +49-30-2888-3545
heino.vonmeyer@oecd.org

Mathieu Weiss
Conseiller pour la Science et la Technologie
Ambassade de France en Allemagne
Pariser Platz 5
10117 Berlin, Germany
mathieu.weiss@diplomatie.gouv.fr
phone +49-30-590039000

Prof. Dr. Abdul Hamid Zakri
Director, Centre for Global Sustainability
Studies (CGSS)
Universiti Sains Malaysia
11800 Penang, Malaysia
zakri@akademisains.gov.my
mobile +60-13-276-2100

Support Team:

Museum für Naturkunde Berlin

Invalidenstr. 43
10115 Berlin, Germany:

Astrid Faber

astrid.faber@mfn-berlin.de
phone +49-30-20938918

Dr. Anke Hoffmann

anke.hoffmann@mfn-berlin.de
mobile +49-177-5610433

Dr. Georg A. Heiss

georg.heiss@mfn-berlin.de
mobile +49-176 64144994

Dr. Andreas Kunkel

andreas.kunkel@mfn-berlin.de
phone: +49-30-2093-8690

Monika Neumann

monika.neumann@mfn-berlin.de
phone +49-30-2093-8544

Manja Voss

manja.voss@mfn-berlin.de
mobile +49-179-7398068

Dorothea Gehringer,
Sonja Kalbfuß

Guided tours:

Dr. Frieder Mayer,

Uwe Moldrzyk,

Dr. Mark-Oliver Rödel,

Dr. Daniela Schwarz-Wings

Photographers:

Antje Dittmann,

Hwa Ja Götz,

Carola Radke

The Natural History Museum

Cromwell Road
London, SW7 5BD, UK:

Frances Allen

PA to Richard Lane
f.allen@nhm.ac.uk
phone +44-20-79425374

OECD Berlin Centre

Schumannstraße 10
10117 Berlin:

Walter Backhaus

walter.backhaus@oecd.org

Sebastian Rubatscher

sebastian.rubatscher@oecd.org

Annexe 2 Draft Strategic Plan for SciColl

Mission Statement

SciColl is an international initiative devoted to increasing the benefits that object-based scientific collections and their associated information produce for scientific research and some of the major challenges facing society. SciColl's dual mission is to:

- help scientific collections and their host institutions increase their effectiveness and the return on investment from the long-term management of collections
- catalyse ground-breaking interdisciplinary research that relies on access to scientific collections and their associated information.

SciColl pursues this mission by:

- Providing an international coordinating mechanism that will enable and energize collaborations across the scientific disciplines that rely on object-based scientific collections, including but not limited to anthropology, archaeology, biology, biomedicine, and the earth and space sciences;
- Identifying and opening new and exciting areas of research that rely on scientific collections and their associated information distributed across disciplines and countries;
- Creating unprecedented access to collections and their associated information in different scientific disciplines;
- Increasing the impact that scientific collections and their associated information have on fact-based policy development; and
- Raising the community standards of specimen curation, collection management, and the training of collection professionals...

SciColl is built on the following foundational principles:

- Object-based scientific collections and their associated information are global public goods. Free and open access to scientific collections by qualified researchers is fundamental to achieving research excellence;
- Scientific collections are an essential infrastructure for many research disciplines;
- Scientific collections are a distributed asset, housed in institutions around the world. No one country can provide the collections and trained collection management staff needed by a research community. International and interdisciplinary cooperation is therefore essential in providing research communities in different countries with the access to collections that they need;
- International coordination of collections can reduce duplication of effort among collections and unnecessary expenses, and can optimize the impact of new collecting efforts by identifying critical gaps.
- Spreading of excellence in collections management and the training of collection professionals is needed to redress the imbalance between collections held in industrialized and developing countries.

What are Object-based Scientific Collections?

“Object-based scientific collections” are objects of study and their associated data and archival material that are used for scientific research and have been accessioned into repositories for long-term preservation. They are the research specimens in public institutions that have been judged too valuable for future research to be discarded at the end of a research project. In addition, specimens that are owned by private collectors, or are proprietary industrial property, or are classified government assets can have significant research potential. Examples of scientific collections would include but are not limited to research in biology, earth and planetary sciences, anthropology, archaeology, ethnology, biomedicine, and in applied fields such as agriculture and environmental protection.

Like the large instruments that form the infrastructure for many branches of the physical sciences (e.g., astronomical telescopes, particle accelerators, superconducting magnets), scientific collections are critical for the conduct of research in many fields. Unlike large research instruments, object-based scientific collections are physically distributed around the world. The responsibility for stewardship of these critical research resources is decentralized and distributed among the institutions, disciplines and countries associated with each collection. The research communities associated with these collections are dedicated to providing qualified scientists with access to specimens in the collections and to the open and equitable sharing of the knowledge and benefits obtained from their study.

The Need for International, Interdisciplinary Coordination of Scientific Collections

Scientific collections form a research infrastructure that is critical to scientific research in many fields. Within each discipline, new types of collections have emerged in response to new research opportunities (e.g., the Age of Exploration; the Space Age; current bio- and nanotechnology). Hundreds of millions of specimens accumulated in thousands of collections, each contributing to a growing body of scientific knowledge..

At the same time, the barriers to accessing them also grew. Collecting and studying new specimens was/is often a higher priority than documenting, curating, and preserving the specimens in existing collections. Scholars in a discipline could have a good understanding of the collections in their respective fields up until the mid-20th century, but that soon changed. The post-war explosion of publicly-funded research led to the rapid growth of collections in all fields, but was not matched by improved methods in record-keeping. In the computer age before the 90s, collections and their associated data had become an enormous but largely undigitized treasure trove. Knowledge of and access to specimens within a research community had become difficult, and access across disciplinary boundaries was essentially non-existent.

Over the past 20 years, significant progress has been made toward documenting collections and improving access within disciplines. The steady growth of digitised specimen and related observational data is increasingly revealing new patterns and allowing new questions to be addressed. Local specimen databases have sprung up, data standards have been established, networks of databases have flourished, and community standards that promote public data access are taking hold.

Access to specimens and data within fields has now improved to the point that we can now see a new and larger research opportunity – and an obstacle blocking the way forward. We now see that collections in different disciplines are complementary in the scientific impact they can have. The greatest research challenges before us are interdisciplinary in nature, requiring collaborations that cross traditional boundaries. The deep-sea cores, ice cores, and fossil plants, animals and microbes that are stored in collections all give testimony to the changes that have taken place on earth. Anthropological artefacts, ice and sediment cores, biomedical samples and samples of biodiversity all contribute to our knowledge of human history.

SciColl was envisioned as the first step toward enabling international, interdisciplinary research based on collections and collection-based information that are currently isolated from each other.

Coordination and its Benefits to Collections

Removing the barriers to interdisciplinary access and interoperability will have an important beneficial side-effect. Each of the communities that maintain scientific collections has confronted similar challenges, including but not limited to documentation, standardization, specimen curation and preservation, and the training of a specialized collection-based workforce. In addition to promoting a new generation of interdisciplinary collections-based research SciColl will enable exchange across disciplinary boundaries of:

- Information, policies, experiences, and standards related to the management of collections and their associated information;
- Skills, tools, systems of training used by collection workforces;
- Benchmarks of success and systems of self-assessment that can be used by collections;
- Other lessons learned that can be of mutual benefit; and
- Methods of digitisation and data capture.

Strategic Objectives, 2010-2013

SciColl's Governance Plan includes a three-year start-up phase of activities led by a limited number of member institutions with support from their national governments. Following this start-up phase, membership would expand and revenue sources would shift to membership fees and project-based funding.

By 2013, SciColl plans to:

- *have engaged the major stakeholders* in each of the disciplines that rely on object-based scientific collections (professional societies, associations of collections, and the institutions with stewardship responsibilities for the collections in each discipline);
- *have demonstrated the potential research impact* of international coordination;
- *have created an inventory* of the major collections across disciplines;
- *have defined the major management and training issues* related to object-based scientific collections that are shared internationally and across disciplines;
- *have initiated an international and interdisciplinary knowledge base* consisting of studies, reports, guidelines, policies, benchmark data and other information resources related to the management of object-based scientific collections;

Long-Term Objectives, 2010-2020

- *Generate world-class research initiatives* that take advantage of scientific collections internationally and across disciplines and can obtain independent support;
- *Raise awareness and support* for object-based scientific collections as part of the essential infrastructure for research, alongside astronomical observatories, particle accelerators, satellites and major databases;
- *Promote greater sharing and access* to scientific collections and their associated information;
- *Offer a forum* for the ongoing discussion of international, interdisciplinary research opportunities involving scientific collections;
- *Provide the organizational structure for improving collection management and training* in the participating disciplines through networks, working groups and special task forces;

- **Promote the growth of new types of collections** that will be essential to next-generation research;
- **Provide advice and technical assistance** to developing countries that are establishing new collections; and
- **Provide an interface** between collection-based science and broader societal issues.
- **Improve standards curriculum, and training opportunities for professional and paraprofessional training in** specimen curation and management of scientific collections that is parallel to the art preservation community;
- **Promote the development of tools for self-assessment** that scientific collections could use to judge themselves relative to standards of community practice
- **Generate benefits** to participating institutions and disciplines in the form of increased efficiencies and cost-savings; improved access to collections and their associated information; increased use and impact of collections for science and society; and improved support for collections by institutions and the public;

Programme of Work, 2010-2013

Promoting collection-based science:

- Raise awareness of value/impact of collections
- Working Group devoted to developing/incubator for new research programs
- Think-tank/Institute of Advanced Studies/Synthesis Center to assemble

Coordinating a 'pioneer' research project on an interdisciplinary topic selected by the Executive Board by:

- Preparing and submitting proposals for funding
- Organizing and conducting exploratory planning workshops
- Coordinating the construction of a knowledge base of collections that can contribute to research in the selected interdisciplinary topic

The current proposal, which would need to be validated by the future Executive board, would focus on how scientific collections can contribute to our understanding of global environment changes.

Networks/Working Groups for:

- Management of collections (best practices, self-assessment, workforce training)
- Access to collections (data standards, physical access)
- Methods (science of collections, development of new techniques)

Annexe 3

Organisational Structure and Governance

This document provides a summary of the organisational structures and the governance model for a new international coordinating mechanism for scientific collections ("SciColl"). Following final endorsement by the Global Science Forum, an interim executive board will develop more detailed, technical documents to formally establish the organisation (e.g. a Memorandum of Understanding or Terms of Reference / Rules of Procedure/Business Plan).

Organisational Principles:

The following principles are proposed based on discussions at the Global Science Forum, the Steering Committee and its Working Groups:

- a globally oriented, international organisation, open to any interested country, relevant organisation or institution from around the world,
- a new, free standing organisation outside the OECD and other existing international umbrella organisations; it will be physically located in relevant collections oriented organisation
- an organisation primarily devoted to the advancement of scientific collections as research infrastructure and the basic and applied research based on and using those collections.

Proposed model of SciColl organisation and membership

Several organisational models for a new mechanism were considered by the Steering Committee and its dedicated Working Group on "Governance, Business Plan & Budget", ranging from independent Inter Governmental Organisations to distributed, institutional-based membership associations. The governance structures and *modi operandi* of several already existing international scientific organisations were examined (see also previous reports to the GSF). The consensus from these discussions was that SciColl should be a membership organisation in both national interests and individual organisations could be represented.

Membership

The following 3 membership categories are proposed

1. Single national representation / national focal points

Country representation (with a minimum of one active relevant institutional member) is designated by a government. It is likely to be a relevant public body (e.g., science coordination or science policy offices, national research councils, public science funding organisations, etc) usually responsible for scientific collections and representing national science policy interests.

For the initial start-up phase of three years, national members will be expected to contribute financially (through a scaled contribution based on GERD), and are offered one seat with voting rights in the Executive Board, as well as representation and vote in the General Assembly.

Following the initial start-up phase of three years, direct financial contributions for national representation will decrease (although project funding will still be sought), together with a possible change of composition and voting rights in the Executive Board.

2. Individual institutions

Membership will include private or public institutions holding collections and/or associated research activities; emphasis should be on institutions with an international perspective in their collections and/or research. Each will have a seat with voting rights in the General Assembly. For individual institutions, 4 membership categories with scaled financial contributions are proposed using criteria such as: size/importance; number of staff; operating expenditures/budget; GERD/GDP per capita for the respective country.

Smaller institutions can apply jointly for membership as a consortium. Institutional members are eligible for a seat with voting rights on the Executive Board.

Scientific collections and related institutions are expected to form the heart of the organisational membership, especially after the initial start-up phase. The number of institutional members is expected to increase steadily, with a possible delay at the early establishment phase of SciColl.

3. International organisations

This group includes international organisations with a significant interest or involvement in scientific collections and the associated research (e.g., IGOs concerned with basic and applied research, scientific unions and associations, international research projects, etc). Generally, international organisations would be non-paying and non-voting members. Organisational members participate in the General Assembly, but without voting rights. International organisations would be eligible to sit on the Executive Board (not more than 10% of total membership), but without voting rights. It is expected that international organisations could bring financial support for specific SciColl work programmes or activities, in which case they would be entitled to take part in decisions affecting that specific programme or activity.

In due course, SciColl could benefit from offering associate membership, observer status and/or other forms of cooperation for relevant partners not covered by these categories (e.g., research projects, commercial enterprises, sponsors, etc).

SciColl governance and organisational bodies:

The following governance structure and organisational bodies for establishing and operating SciColl is proposed:

Secretariat

The Secretariat acts as the SciColl international office, the organisations' main executive arm, also providing membership services and implementing work programmes. The secretariat is led by an Executive Director (SciColl CEO), with a key senior role for leadership, management, representation, and diplomacy. The Executive Director is appointed by the Executive Board and confirmed by the General Assembly; a performance evaluation is carried out by the Chair and Vice-chairs of the Board. He/she serves as secretary to the Executive Board. In addition to the Executive director, the following staff are desirable for the effective functioning of the initiative:

Communication specialist, executive assistant, 1-2 secretaries/administrative office help; 2 Programme Officers (may be funded or seconded through SciColl activities); an ICT/web specialist, possibly part-time, who may be contracted out

The Secretariat is hosted by a SciColl member (country, institution) providing building/rooms, basic facilities & services [for detailed requirements, see annexe 4 “Request for proposal to host the SciColl Secretariat”]. The selection of the host organisation will be made by the Interim Executive Board. A special agreement with the host organisation/institution, defining the mutual responsibilities will need to be signed at the outset. In the longer term, the Secretariat host may be changed by a decision of the General Assembly.

General Assembly

The General Assembly represents the entire SciColl membership, including national level representation, individual institutions, and organisations. It is the ultimate decision taking and governance body for SciColl and will determine strategies, the work programmes as well as agreeing the budget. The GA elects the Executive Board once the organisation is established and is expected to meet once a year during the establishment phase, with a possible lower frequency later on. SciColl members may send more than one representative to the General Assembly, but will have one vote only. GA meetings are preferably held each time in a different geographical location (hosted by a membership country/institution), possibly in conjunction with an annual policy forum, science fair or scientific conference. The meetings of the GA will be chaired either by the Chair of the Executive Board or a meeting chair specifically elected at the meeting.

Executive Board

The Executive Board oversees the day to day work of the organisation, and the operation of the Secretariat. During the establishment phase (first 3 years), the Executive Board is composed of national members representatives (1 per country), and an equal number of institutional or international organisation members chosen by the national members. After the 3 year establishment phase, the Executive Board will be elected by the General Assembly, following a proposal by the Executive Board ensuring a balance in terms of geography and disciplines, with up to 1/3 of its members composed of national representatives (the General Assembly may accept or reject the overall proposal but not individual members). National representatives not elected onto the Executive Board will retain a seat in the General Assembly. The Executive Board is elected for a 3 years term, with a mechanism for rotation.

The Executive Board will have a Chair and two Vice-Chairs. During the establishment phase (first 3 years), the Chair and Vice-Chairs are elected by the Executive Board. If the Chair is a national representative, then at least one of the Vice-Chairs should be from an institutional member. After the initial phase, the Chair and Vice-Chairs are elected by the General Assembly, following a proposition from the Executive Board.

The Executive Board should meet regularly (at least 3 times/year), usually with the Executive Director in attendance. As a general rule, it will meet at the Secretariat location. The expenses for the Chair are covered from the organisation's budget, but no salary or remuneration is paid.

Scientific Advisory Board

The Scientific Advisory Board is to provide high level advice on scientific issues to the Executive Board and the Secretariat, especially in further developing the programme of work. It proactively develops visionary themes and agendas for wider science involving scientific collections, and makes proposals how better to manage and engage scientific collections in ongoing research activities. The EB helps SciColl link to relevant scientific user communities, and stakeholders especially outside SciColl membership. The SAB is composed of up to 10 individuals with a senior science background ("national academician" level), to be chosen on the basis of their individual capacity and expertise. Membership is for a 2-year term, renewable once. Candidates for the SAB are nominated by the General Assembly, and members will be appointed by the Executive Board. The Scientific Advisory Board elects a Chair from among its members.

Operating costs for meetings (travel, logistics) of the SAB are supported by the SciColl budget. The Secretariat will provide secretariat support to the SAB.

Special committees and ad hoc task groups

As part of the work programme of SciColl, special committees and ad hoc task groups may be established by special appointment of the Executive Board and/or the General Assembly, with a time-limited mandate and for specific tasks. These specific activity-related groups are expected to be supported by seconded staff and resources provided by individual members.

Budget

The proposed budget is presented for the first four years showing how the expenditure increases as staff are recruited and anticipated activities are launched. The costs in year four are expected to be average costs in the long term. It is anticipated that the 'programme' costs will be matched by externally funded projects. Costs are estimated in Euros.

Table 1 proposed budget for SciColl

	Year 1	Year 2	Year 3	Year 4
Secretariat costs				
Executive Director	120,000	120,000	120,000	120,000
PA, secretary	40,000	40,000	40,000	40,000
Deputy Executive		70,000	70,000	70,000
0.5 ITC specialist	30,000	30,000	30,000	30,000
Communications/PR officer	25,000	50,000	50,000	50,000
Travel and meeting expenses for Exec Director and staff	18,000	36,000	36,000	36,000
Office furniture and copiers	8,000			2,000
Computer hardware and software	8,000			2,000
Consumables and other recurrent costs	10,000	10,000	10,000	10,000
Auditing costs	4,000	4,000	4,000	4,000
Communications (PR/marketing) costs	16,000	16,000	16,000	16,000
Staff training		6,000	6,000	6,000
IT and ISP costs	10,000	10,000	10,000	10,000
Total secretariat costs	289,000	392,000	392,000	396,000
Committees and other costs				
Costs of Ex. B Chair in addition to basic membership of Exec	10,000	10,000	10,000	10,000
Sci Advisory Board meetings	20,000	20,000	20,000	20,000
General Assembly costs -	50,000	50,000	50,000	50,000
total committee costs	80,000	80,000	80,000	80,000
Secretariat & committee costs	449,000	552,000	552,000	556,000
Programme of work				
Programme officer (scientific impact of collections)	35,000	70,000	70,000	70,000
Programme officer (SciColl management issues)	0	35,000	70,000	70,000
Programme of work costs, including administration of finance: matching grant funding	0	50,000	100,000	100,000
Convening/supporting ad hoc activities and task groups	25,000	50,000	50,000	50,000
Total programme of work costs	60,000	205,000	290,000	290,000
Total costs (Euros)	509,000	757,000	842,000	846,000

Financial contributions

Contributions to the funding of SciColl will be from country and individual institutional members.

Country contributions: For single national representation, a annual financial contributions will be requested for the first 3 years of SciColl, according to GERD, divided into four proposed categories detailed below. The exact contribution amounts still remain to be decided, but will need to cover an important part of the SciColl budget, before institutional contribution take over.

Table 2.

Category	GERD (latest available figs)	Countries (examples)	Estimated contribution (€ p.a.)
1	> \$50 billion	USA, Japan, Germany, China	60-120 k€
2	\$18-50 billion	Canada, France, Italy, Korea, Russia, UK	30-60 k€
3	\$7.5-18 billion	Australia, Austria, Israel, Netherlands, Spain, Sweden, Switzerland, Chinese Taipei,	12-30 k€
4	< \$7.5 billion	Belgium, Finland, Singapore, South Africa, Portugal, Norway, Poland,	7-12 k€

Individual institutional contributions (public and/or private institutions): annual financial contributions by institutional size and scope (operational budget, number of staff, etc), in four proposed categories:

Table 3

Category	Operational budget [US\$]	Staff number	Scope	Institutions (examples)	Contribution € (p.a.)
1	>\$10 million	>150	Multiple disciplines, global coverage,	NHM, SI, MNHN	25,000
2	\$1 million - \$10 million	50-150	International orientation,	MfN Berlin, Naturalis,	10,000
3	\$200k - \$1 million or small consortia of up to 10 instit.<\$200k	10-50	Primarily nationally/regionally oriented institutions	INBIO, NMK, University of New Mexico	5,000
4	<\$200k	<10	Fewer disciplines, specialized collections	Linnean Society London,	2,000

Annexe 4

Request for Proposals to Host the Secretariat of Science Collections International (SciColl)

This document describes the requirements and procedures to be followed for submitting a bid to host the Secretariat of Science Collections International (SciColl). Further details about SciColl and its organizational structure are found in the Memorandum of Understanding (MoU), and the Terms of Reference and Business Plan, both of which should be consulted when preparing a bid. In the event of any ambiguity in interpreting this document, the language of the MoU will take precedence.

ROLE AND PURPOSE

The SciColl Secretariat Host is to provide the location, facilities and services agreed to in an arrangement between it and the SciColl Executive Board. Expected services include, but are not limited to, staff management, financial management, accountancy, legal services, Internet access, IT capabilities, and logistical & technical assistance. The SciColl Secretariat Host is to house the SciColl Secretariat and manage it in accordance with domestic laws. The SciColl Secretariat Host is to also obtain or provide legal status for SciColl. Subject to the laws of the country in which it is located, the Secretariat Host will be accountable to the Executive Board and General Assembly for all matters pertaining to SciColl, except as otherwise provided in the Terms of Reference.

ELIGIBILITY

A bid may be submitted on behalf of a government or an institution that intends to be a Member of SciColl.

REQUIRED CONTENTS OF A BID

Proposals must include the following information:

1. Background: A description of the proposed host organization, including its location and physical and managerial capabilities and its research collection significance / related resources.

2. Plan: An analysis of how the proposed Secretariat host is to meet the requirements of this solicitation and the requirements stated within the SciColl Terms of Reference and Business Plan, including:

- **Legal Status of SciColl.** The bid should describe the proposed legal status of SciColl, which should allow it to carry out the activities and work programme under the orders and authority of the Executive Board and General assembly. SciColl should be able to receive and disburse funds, enter into contracts for goods and services, hold title to property, and hire personnel as needed. This status should preferably be similar to that of a non-profit organization with tax-free status consistent with the laws of the country. The bid should describe the benefit, if any, that SciColl could derive from special rules or exemptions (for instance, on taxes or import duties), and the degree of legal/administrative independence for SciColl. It should also include a description of any local regulations that could impose restrictions on SciColl, its funding, or operation. A detailed description of the organizational relationship between SciColl, the Secretariat, and the host organization, including how and when SciColl and the Secretariat is to obtain separate legal status if any, should be included.

- **The Secretariat Host.** The bid should identify a legal entity in the host country that will be closely associated with SciColl and, as specified in a legal agreement with SciColl, may provide certain facilities, infrastructure and services needed to carry out its activities. It should provide an explanation of how the host organization can accommodate the needs of the SciColl Secretariat and which of the required capabilities, if any, is to be outsourced. The date/time frame for the availability of the infrastructures/resources and legal status should be provided. The initial contract for the Secretariat Host will be for a period of five years. Following that period, if agreed by the SciColl Governing Board and the Secretariat Host, the contract may be extended for additional periods. Either party may, without cause, terminate this arrangement by providing six months written notice to the other party.
- **SciColl (Secretariat) Staff.** The bid should specify the employment status of the staff, including rights, benefits and pension rights (if any). Provision should be made for hiring staff of any nationality. The personnel management provisions (hiring, review, termination, etc.) should be described. The potential employment status of staff companions should be specified. The bid should describe the status of SciColl officers and professional staff, technical and support staff and staff companions. The bid should also describe any special provisions for staff co-located with SciColl but seconded from and paid by another institution or country. It should include a description of personnel management provisions (hiring, review, termination, etc.)
- **Receiving funds.** The bid should describe the process for receiving, holding, managing and accounting for funds from contributing countries, public or private institutions, private company sponsors, and other entities. The process for receiving in-kind contributions should also be specified. Plans for management and accounting of SciColl's finances, including a plan of how to manage currency fluctuations and possibly cash flow delays between expenditures and income should be included.
- **Disbursing funds.** The bid should specify how goods and services will be purchased at the request of SciColl under the authority of the Executive Board. It should describe efficient procedures that will allow SciColl to use its funds to pay for certain expenses, including the following:
 - Secretary General: Salary and benefits
 - Staff: Salaries and benefits for staff personnel,
 - Consultants for services including, but not limited to legal and intellectual property rights
 - Travel
 - Expenses incurred by members of the SciColl Executive board, members of the SciColl Science Advisory Board, members of SciColl task groups...
 - Workshops, meetings, training, and technology transfer
 - Purchase and maintenance of specialized equipment or software,
 - Other costs related to SciColl operations, as approved by the SciColl Executive Board
- **Office space and meeting facilities.** The bid should describe a detailed description of the space being offered and its availability, as well as additional services provided by the host for SciColl Secretariat, taking into account a requirement for 5-10 staff number.

3. Budget: Provide an analysis of any funds that the submitting country/institution is offering to commit to the Secretariat, and assurance that these funds are in fact available.

Voluntary Contributions of the Bidding Country/Institution

Each bidding country or institution is encouraged to contribute optional goods and services to SciColl, both at SciColl start-up, and on an ongoing operational basis. Such contributions may include those listed below. This list is meant to provide examples, but not be exhaustive. Each bid should include any relevant items that may not be listed but are deemed valuable by the bidding Host. Each bid should also specify the availability and cost, if any, of the contributions listed below, as well as any other relevant contributions:

- Space and furnishings — including offices and general work areas to support an appropriate and potentially flexible number of Secretariat staff, classroom/conference space, space for visiting scientists and students, off-site temporary housing for visiting scientists and students, desks, chairs. As a frame of reference, number of permanent staff specified in the Business Plan is about 6-8.
- Financial contributions to SciColl above and beyond the Institution or Government Contributions outlined in the Terms of Reference and Business Plan.
- Seconded staff position (technical or administrative), full or part-time, to SciColl Secretariat, to work under the supervision of the Secretary General.
- Utilities, including lighting, electrical (conditioned power), cooling, and heat.
- Communications infrastructure
- Computing infrastructure
- Office equipment
- General facilities infrastructure, including housekeeping services, signage, parking for staff and visitors, postal services, storage, and security.
- Financial services, including general accounting, payroll, inventory, purchasing, audit, tax compliance, and legal compliance. (Electronic/online infrastructure required.)
- Donations and grants management and business development.
- Clerical staff.
- Computing and communications infrastructure services — including ISP and LAN maintenance.
- Contracting services, including the ability to make, accept, and manage contracts with third parties.
- Human Resource Management
- Legal services, including but not limited to services for confidentiality, liability, and protection of intellectual property
- Recruitment and hiring, including the ability to hire non-nationals on a non-discriminatory basis.
- Benefits, including health insurance, a convertible retirement programme, sick leave, vacation leave, education and childcare, etc.
- Equal-opportunity recruitment policy.
- Non-discrimination employment policy.

Desirable Attributes

Additional desirable attributes of a bid could include items listed below. Again, this list is not meant to be exhaustive, and the bidding Host should include all items deemed valuable, even if they are not listed.

- Placement of the Secretariat within, or with easy access to, a relevant research collection organisation.
- Proximity and ready availability of information technology, including a robust library and open access to on-line journals.
- Proximity or easy access to other international organizations with whom SciColl might need to coordinate.
- Proximity to an international airport and convenient local ground transportation.
- Meeting facilities
- Access to language/cultural orientation classes for Secretariat staff and families, work permit for staff companions.
- Access to convention planning/hosting capabilities.
- Non-smoking workplace

CRITERIA FOR EVALUATION AND SELECTION OF SECRETARIAT HOST

The Secretariat Host is to be chosen by the Executive Board, as defined in the Terms of Reference, or the Acting Executive Board at the time (defined below). The bidders for the SciColl Secretariat Host are required to demonstrate their capacity to provide for institutional arrangements which conform to the closest extent possible, under their respective domestic law, with the criteria for the SciColl Secretariat Host, SciColl Secretariat and Secretary General, as outlined in the SciColl Terms of Reference, Business Plan and in the Request For Proposals To Host The SciColl Secretariat, and which satisfy any other criteria required by the Executive Board.

Acting Executive Board: Prior to the establishment of SciColl as a legal entity, the Acting Executive Board will consist of one delegate from each country and institution having provided evidence of the intent to become Member as defined in the Terms of Reference; Governments from such countries and Institutions are invited to send a letter of intent to the Global Science Forum Secretariat by September 1st 2010.

Criteria for the selection of the Secretariat Host include, but are not limited to, the following:

- The Proposal itself as an example of the Bidder's work (such as the details or completeness in responding to all aspects of the RFP).
- The Bidder's organizational and institutional ability to provide the services listed in this RFP.
- The extent to which to Bidder can host SciColl as an independent legal / administrative entity with purchasing and contracting autonomy.
- The additional amenities offered by the Bidder.
- The financial support and incentives, including but not limited to tax-exempt status and cost of host-provided services, offered by the Bidder.
- Proximity and ready availability of information technology and....
- The Bidder's technical approach and project organization, as presented in response to this RFP.
- The experience of the Bidder in hosting other international programs.

PROCEDURE FOR SUBMITTING A BID

Questions about bids, procedures, selection criteria, or any other related item are welcome in advance of submitting a bid. Please direct all questions to the GSF. The questions, and their responses, will be posted to the SCiColl website in a timely fashion. (Therefore it is strongly encouraged to check the website frequently for updated before submitting a bid.)

Bids should be provided, both in digital form and on paper, in a sealed envelope to the Executive Secretary of the GSF, postmarked by September 1st 2010. The Executive Secretary of the GSF is to notify the bidder when the materials have been received.

PROCEDURE FOR THE REVIEW OF PROPOSALS

The Executive Secretary of the GSF will convene and chair an international committee of three to four members comprised of experts in the areas of research collection management, use or research collection and professional organizations and science administration. These individuals will be capable of providing neutral evaluations, and will not have been previously involved in SciColl.

The proposals are to be sent to the committee at least two weeks prior to their meeting to review the applications. At the review meeting each application is to be discussed by the reviewers and evaluated using the criteria outlined in this document. A brief critique written jointly is to be provided for each proposal delineating the strengths and weaknesses. Criteria which can be directly compared among all bids will be evaluated on a comparative (ranked) basis. Additional criteria, which may not be provided in all bids, will be considered separately on a case-by-case basis. The committee will rank the proposals. Within one month following the postmark deadline, the committee will send to the (Acting) Executive Board copies of the proposals, a document that justifies the rankings, and the brief critiques of all of the proposals.

PROCEDURE FOR SELECTING THE SECRETARIAT HOST

The (Acting) Executive Board is to receive copies of the ranked proposals as well as the reviews from the review committee. The (Acting) Executive Board will meet within three weeks of receipt of the materials from the review committee, and will select the host based on this material. The (Acting) Executive Board should make its final decision by 15 November 2010.