CSIRO Information Services and Its Evolving Role

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This paper provides an historical and current overview of CSIRO information services. It examines the cooperative sharing of information resources across the Network, and the role of the single union catalogue using Voyager software, the Directory of Information Tools (DIT) and electronic journals. The changing role of the information professional within this environment is also examined.

The intranet provides end-users with an information source rich in both internal and external datasets. CSIRO Information Technology Services (ITS) has been working on making these resources available through a single end-user interface.

This paper also briefly describes some of the recent research projects and activities within CSIRO that have provided and will provide a safer environment for communities both in Australia and overseas. Those projects and activities include: Project Vesta; the Bushfire Cooperative Research Centre (CRC); developments in testing to new fire safety regulations; fire safety engineering; development of a new fire truck protection system; Sentinel hotspots—satellite-based mapping tool; the CMIT fire science and fire safety engineering teams; and the proposed new fire facility in Sydney.

Introduction

CSIRO (Commonwealth Scientific and Industrial Research Organisation) is Australia's premier research organisation. It is one of the world's largest and most diverse scientific global research organisations. CSIRO's purpose is to deliver great science and innovative solutions for industry, society and the environment. We are focussed on providing new ways to improve the Australian quality of life, as well as the economic and social performance of a number of industry sectors through research and development. Our disciplines include agriculture, environment, health, communications, IT, manufacturing, construction, minerals and energy. We serve governments, industry and communities across the nation and also globally.

Based on Institute for Scientific Information data on total citations of publications, as at July 2003, CSIRO ranks in the top one per cent of world scientific institutions in 12 of 22 research fields. Worldwide, it ranks fourth in agricultural science, sixth in plant and animal science and seventh in environmental science/ecology.

CSIRO is Australia's leading patenting enterprise, holding over 3900 granted or pending patents. There are now also more than 80 spin-off companies based on CSIRO-generated intellectual property and expertise.[1]

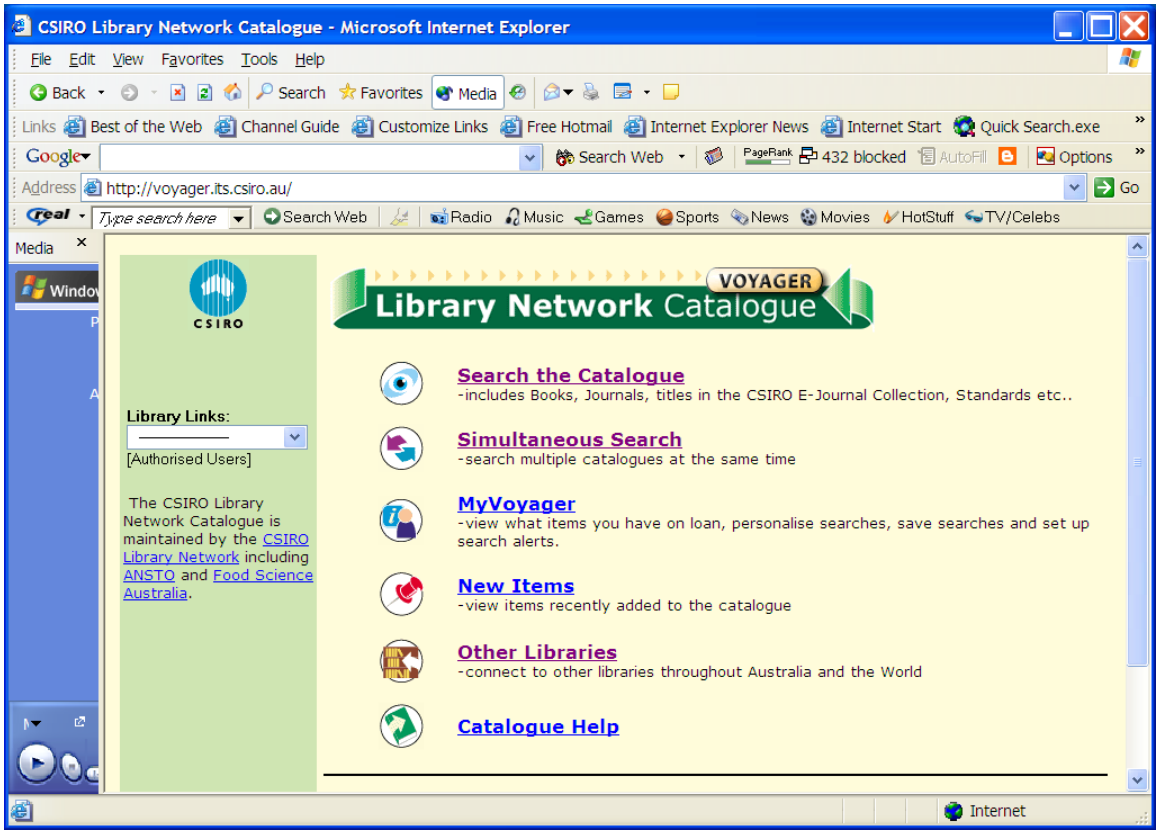
[1] CSIRO Snapshot, http://www.csiro.au/proprietaryDocuments/Snapshots.pdf.

CSIRO Library Services

The CSIRO Library Network consists of autonomous divisional libraries (including their branches) and site libraries, which provide library and information services to staff of one or more CSIRO divisions and business units.

CSIRO's 20 discipline-based research divisions (and over 6500 staff) are based at over 58 sites within Australia and overseas. They are served by a national network of divisional and site libraries. The CSIRO Library Network extends beyond CSIRO itself to encompass also ANSTO (Australian Nuclear Science and Technology Organisation), Food Science Australia (FSA) (a joint venture between CSIRO and the Victorian Government's Australian Food Industry Science Centre) and some CRCs which are co-located with CSIRO laboratories. Physical resources (and many specialised online resources) are funded and provided mainly on a divisional basis, with cooperative sharing of these resources across the Network, facilitated by a single union catalogue using the Voyager software.[2]

Voyager provides access to the collections of CSIRO, ANSTO and FSA (see http://voyager.its.csiro.au). Voyager also allows staff to check for items in other libraries both in Australia and overseas by using the 'Other Libraries' option.



CSIRO Library Network Catalogue home page

[2] Girke, Thomas, 'The one-stop shop: a single user interface for search and discovery across digital library collections', *Information Online* 2003, Sydney (http://conferences.alia.org.au/online2003/papers/girke.html).

History of CMIT

The Sydney-based part of CSIRO Manufacturing & Infrastructure Technology (CMIT) originated as the Commonwealth Experimental Building Station, which was established in 1944. From the outset, the Station professed an unequivocal policy of cooperation with industry, the professions and, in particular, with the organisation that would be its collaborative partner, the Council for Scientific and Industrial Research (CSIR).[3] While Sydney had the Commonwealth Experimental Building Station, the CSIR established the Building Materials Research Laboratory in Highett, Melbourne. Both organisations went through processes of name changes—the Experimental Building Station and the National Building Technology Centre in Sydney, and the CSIRO Division of Building Research in Melbourne. However, the most significant structural change occurred in 1992, when the two organisations merged to become CSIRO Building, Construction and Engineering. In 2003, the Division became larger, with the incorporation of CSIRO Manufacturing Technology in in Adelaide, Brisbane and Melbourne. Hence, we have the current CMIT, to which I am affiliated. There has always been a major focus on fire testing and research in Sydney and Melbourne, and this will be examined later.

CMIT Library Services

Needless to say, there have been challenges for the libraries. Changes in the parent organisation's infrastructure usually results in reviews and rationalisation of library collections, resources, software, hardware, staffing and locations.

In 1986, the National Building Technology Centre library had automated its library on the then available STATUS-E full-text software, and had embarked on networking the catalogue around the North Ryde site. Once merged with the CSIRO, the libraries were able to merge catalogue records and make a single database using Inmagic, networked across both sites, facilitated by the use of SearchMagic software. Holdings were also added to CLINES (the CSIRO Library and Information Network) then on GEAC software and holdings added to the National Database at the National Library of Australia, now Kinetica.

Both libraries had comprehensive historical collections in building and fire research reports from around the world, including Canada, UK, Sweden, USA and South Africa. The joint collection was rationalised and, in 1999, the Sydney library's physical collection (other than those items requested on permanent loan by staff in Sydney) was transferred to Melbourne. Soon after this, and in an ever-increasing environment of sharing and making more efficient use of resources, the decision was made to have one access point to information sources, in line with other CSIRO libraries, using the one system—Voyager.

Both libraries had relied on search services (DIALOG, ESA, CDROM networking, full-text access to Standards Australia etc.) and networking CDs by a CD files server to retrieve journal articles, reports and standards.

[3] Bock, Geoff, *The End Was to Build Well: A Half Century of Australian Government Building Research*, CSIRO Building, Construction and Engineering, 1995.

My own role at this stage changed from being a library manager to an 'information person'. I used 'information broker' for some time and then 'information specialist', but perhaps 'information officer' would be better. My role became one of working closely with teams to service their information needs. It meant more understanding of what was required and also because of my proximity, in an office close by, a very prompt, on-demand service. If books or printed literature was required, this was an overnight request to Melbourne—or in some cases a closer library or bookshop.

Increasingly, however, access to electronic sources (particularly journals) was being made available directly to the users via their desktops. More focus was being placed on training users, and my mobility around offices facilitated this role.

In 2003, as previously noted we joined together with two other Divisions with locations in Adelaide, and two locations in Mebourne (Preston and Clayton), and we became CMIT. The new library name became the Information Services Group.

CSIRO Online Resources

During the late 1990s, the CSIRO Library Network began collectively acquiring online resources to be made available to staff via the desktop across the entire organisation (and, where possible, its affiliates as well). These resources grew as funding and technological opportunities developed and now consist of a variety of products on differing platforms:

- Locally loaded abstracting and indexing (AandI) databases (such as Current Contents, CAB abstracts, Compendex) on two different platforms—SIM (Structured Information Manager, now known as TeraText, developed by RMIT) and ScienceServer (now owned by Elsevier Science).
- Locally loaded full text (eight publishers, including the full set of 1600 Elsevier Science/ Academic Press journals) on ScienceServer.
- Locally loaded article-level metadata with links out to remote full-text content (via ScienceServer).
- Remotely accessed subscription-based AandI and full-text content (www, with authentication).
- Remotely accessed free content (www).[4]

The One-CSIRO philosophy was being helped along by the greater purchasing power that the libraries had as a group—and this was recognised early on with negotiations with suppliers. In 2002/2003, the IT Services (ITS) Knowledge and Information Management group managed $5.2m in divisional and corporate funds for CSIRO e/wide subscriptions and 27 dataset subscriptions. A further $2.6m was managed for site-specific print/online subscriptions. Some divisions also managed some subs separately—this amount is unknown.[5] The control and available budgets of the individual libraries has been diminishing as a central One-CSIRO position is taken, and increasingly a portion of the divisional library's budget is directed to the 'non-negotiable' contribution to the CSIRO e/journal subscriptions.

[4] Girke, Thomas, 'The one-stop shop: a single user interface for search and discovery across digital library collections', *Information Online*, 2003, Sydney (http://conferences.alia.org.au/online2003/papers/girke.html).
[5] Review of electronic journals preformance and issues, Jacquie Porter and Gerry Moffat (ITS), internal ppt presentation, LIS Workshop, 2 September.

CSIRO Directory of Information Tools

In order to guide staff to a 'one-stop shop', an attempt was made to gather all available library and information products together in one easily accessible listing. This resulted in the creation of the CSIRO Directory of Information Tools (DIT) on the intranet, consistently one of the most highly used websites by CSIRO staff.[6] Tools can be accessed by title (as illustrated below) or selected by subject, library or authorised group.

Researchers are encouraged to set up their own current awareness profiles through relevant databases and also to set up alerts to new journal issues as they are made available. Links are made available at e/journals to either abstracts, full text or save to a format for personal biblio packages, in particular Procite. Subject or topic alerts can be set up in Compendex, Web of Knowledge, Current Contents, Web of Science, Derwent Innovations Index, ISI proceedings and Cambridge Scientific Abstracts etc.

For business information, the CSIRO has access to Dun and Bradstreet reports. We can also look into the CSIRO D&B email box for reports downloaded by other librarians from Dun and Bradstreet to avoid duplication (and also to alert other scientists of similar interests).

Directory of Information Tools—main menu

[6] CSIRO Directory of Information Tools: from concept to practice, Jean Deacon, Cynthia Love and Kutira Bandte, internal ppt, IMTC '99, 10 November 1999.

Within CMIT, and within our own intranet, we have additional specific tools for use for our Divisional staff. Australians Standards Online gives access to all full-text standards and also ISO, IEC, JIS Din (pay by request)—the access to this has been extended CSIRO wide in the interests of cooperation. Several more widely used sections of ASTM Standards are also available online as are NFPA standards (through our NFPA membership), and Fire Worldwide (CD)—soon to be accessed via the internet. BCA Online, which accesses the Building Code of Australia online is also an essential tool for our fire safety engineers as are several sections of Reeds Construction Data.

IBISWorld is available to CMIT (http://www.ibisworld.com.au) for our business information needs and again, once these reports are open, they are available for all to view within CMIT. We also have access to Factiva within CMIT and several alerts have also been set up in Factiva (http://www.factiva.com.au) for interested staff tracking daily news.

Industry and company data is also in high demand. Other specialised services include Kompass, BCIAsia (project listings in Asia), BCIAustralia (project listings in Australia), Grantsearch and Tenders databases.

Training

With so many resources accessible on the desktop, it's important that users not only understand the resources, but are also able to use the resources to their full potential. Some users revel in this – in my situation, because I work with various groups, I am usually on call to provide information needs and services as required.

Current awareness services are, however, very important for users to set up, particularly when the access is via e/access and no longer in paper form on display.

Current information awareness alerts can be set up in the ejournals, i.e. new issue table of contents alert (on journals of interest), new citation alert (i.e. you will receive an e/mail if there are any future articles which cite the one of interest) and, of course, a subject search.

In addition to the above, CMIT has e-access to some journals for CMIT staff only—not CSIRO-wide—these require training also.

Alerts can also be set up in Web of Knowledge, Current Contents, Web of Science, Derwent Innovations Index, ISI Proceedings and Cambridge Scientific Abstracts.

Our own intranet is another source of useful information—where business resources can be sourced and also personnel details, policies etc. The CSIRO intranet is also a very rich source of CSIRO information (easily searched with the use of Panoptic software (developed by CSIRO).[7]

[7] http://www.csiro.au/index.asp?type=activity&id=PanopticSearch&stylesheet=aboutCSIROActivity.

Publications

Publications and other datasets are searchable and available on Encompass software for searching by CSIRO staff. Other access for searching through publications is through the Divisional publications site at http://www.cmit.csiro.au (Science Papers).

ENCompass stores data in either local collections (repositories) or can search external repositories. The federated search mechanism is designed to simultaneously search across both of these types of collections.

Local Digital Collections

Digital collections are local repositories and provide the means to create and organise local digital content with different types of descriptive metadata and object types: images, audio, video etc. ENCompass provides the ability to load existing digital content using a metadata loader that can process and load XML data into these collections.

Local digital collections include:

- Stanley Fowler photo collection.
- Forestry & Forest Products Eucalypt photos.
- CSIRO Publications metadata database.
- Stored Grain Research Laboratory Index.
- Business Information Index & Directory of Information Tools.
- Australian Earth Sciences Information Service.
- CSIRO Translation Collection.
- ABARE Publications.
- CSIRO Minerals photos.

Staff are encouraged to add other types of objects and associated metadata to this page. Integration of external repositories as these become available, will be added to the appropriate collection. They will include A&I databases, library catalogues, journal articles, reference works and a couple of web search engines. [8]

It was announced that Encompass is not going to develop its software, so this project has stalled for the moment.[9]

Future Directions

With the One-CSIRO policy in mind, the libraries have been involved in a project to achieve a One-CSIRO Library Service project, now called One Information Services project, which now includes records management activities. This project emanates from the Future of Libraries & Information Services in CSIRO 2002 review. Library working groups and workshops throughout 2003 have moved this project forward and we are likely to see changes following similar one IT

[8] Internal Web information re collections.
[9] Conversation with Lance Deveson, 16 July 2004 following his attendance at Elsevier LibraryConnect Seminar, Hilton Hotle, Melbourne, 14th July, 2004

changes currently being implemented, where IT are a separate IT group and not part of the divisional structure.

Increasingly, the information specialist's job has changed over the years—there is more training of end users, more access to information directly from the web (i.e. increased number of reports available on the web), and increased need for market intelligence reports, business intelligence and research analysis of information. Metadata, publications involvement and communications roles have also surfaced as areas where information specialists are involved.

CSIRO's Research and Involvement in Fire

CSIRO's involvement in fire covers fire as it relates to buildings, as well as to the environment. Whilst my direct involvement with fire information has been through CMIT its precursors, given the nature of this conference and the interest of the inFire group, I would like also to mention some achievements of CSIRO in the fire field in the last few years. Some of these projects are very exciting and demonstrate CSIRO's capabilities in this area. The activities of the Fire Science and Technology Laboratory (FSTL) at CMIT are also described.

Bushfires—Project Vesta

CSIRO's Forestry & Forest Products' Bushfire and Behaviour Management conducted an internationally recognised research program spanning five years, called Project Vesta. This project was conducted in collaboration with the Western Australian Department of Conservation, and land management agencies and fire authorities in other states.

Through a series of extensive field experiments, the team was able to show that the size and shape of a 'head fire' is an important variable, which was not previously included in traditional bushfire spread theory. The development of a new way to easily describe the characteristics of forest fuel that determine fire behaviour has enabled the team to produce new fire spread models.

Further work on the quantification of the combustion and flight characteristics of firebrands produced by forest fires has provided core information for the development of guides for the protection of properties in the vulnerable forest/urban interface for use by fire authorities, council planners and home owners. The particular benefit to firefighters was the identification of the 'Dead-Man Zone'—a neglected area of firefighter safety.[10]

Sentinel Hotspots

CSIRO's Land and Water team has produced an internet-based satellite mapping system called Sentinel Hotspots. This was developed with collaboration from GeoScience Australia and funding from the Defence Imagery and Geospatial Organisation (DIGO). It was launched during the 2002/2003 bushfire season and provided firefighting organisations across Australia with a new management tool to identify 'hotspots', and help allocate resources where they were most needed. Soon after its official launch on 15 January 2003 by the Minister for Science, the Hon.

10 http://www.bbm.csiro.au/vesta.

Peter McGuaran, Sentinel Hotspots confronted an unexpected real-life test. As fires spread over Canberra on 19 January, the 'pilot' website was bombarded by firefighters, media and concerned members of the public, all logging on to check the blazes. The next priority was to build a duplicate website for the exclusive use of emergency services. The second website was up and running by 24 January.

CSIRO team leader, Alex Hood, explained: 'Before the creation of Sentinel Hotspots, emergency services in Australia (with the exception of Western Australia and the Northern Territory) relied on "eyewitness" reports from people in vehicles, fire towers, spotter planes and helicopters to pinpoint the location, extent and rate of fire. There are now "eyes" in the sky—and Sentinel Hotspots can be used by the public as well as emergency service personnel. It can be accessed by anyone with a computer linked to the internet.'

Discussions are under way to enhance the predictive ability of Setinel Hotspots by incorporating other leading CSIRO research, for example bushfire behaviour and wind prediction models. The CSIRO is also considering approaches from overseas interests keen to set up similar systems elsewhere.[11]

Safer Fire Trucks

Researchers at CMIT have been developing and proving a world-first fire truck protection system that helps firefighters survive when caught in a wildfire. The survivability of firefighters in accidental 'burnovers', where they are suddenly trapped in their vehicle by bushfires, has been significantly improved since the testing and refinement began in 2002. The success of the new system is based on a unique bushfire simulator used to test an improved protection spray system and radiation shield for the truck. This uses calibrated gas to simulate different fire conditions and over 50 sensors to measure their ferocity and likely effect on occupants. The new system was developed in partnership with the NSW Rural Fire Service, the Country Fire Authority of Victoria and CSIRO.[12]

CMIT Fire Science and Technology Laboratory (FSTL)

Within FSTL, there are three activities (fire science, fire safety engineering and fire testing). They work together under the FSTL to provide commercial services to clients, but can pass on the information gleaned to the research group.

Fire Science[13]

The Fire Science Team was formed under the leadership of Dr David Yung (formerly of NRCC in Canada) in 2002. Fire Science consolidates a broad range of fire research activities into an integrated team (located in Sydney and Melbourne) that can coordinate research and address

[11] http://www.sentinel.csiro.au.
[12] CSIRO Creative Solutions / produced by CSIRO Corporate Communication, Canberra, ACT, 2003. (http://www.csiro.au/proprietaryDocuments/CreativeSolutions2003.pdf)
[13] The information about the Fire Science team was provided from a conversation with David Yung on 15 July 2004 and from a draft website on Fire Science.

various fire safety issues. The team is multidisciplinary, including mechanical engineers, chemical engineers and chemists.
A new fire laboratory at North Ryde is planned and will provide a place for conducting realistic fire experiments to obtain the needed data for developing fire prediction tools for fire safety designs, as well as for developing better fire protection systems. The new fire laboratory could act as Australia's national fire laboratory and would be the only one of its kind in this part of the world.

The Team, with a staff of 22 full-time equivalents, is organised around three capabilities:

1. *Bushfire research*—building on CSIRO's reputation as a world leader in understanding bushfire impact on urban fringe areas. The Bushfire Research project has had a long history of observing and recording the way in which bushfires impact on infrastructure. The project extensively surveyed the aftermath of every bushfire involving significant house loss from Ash Wednesday to the present. Combining this work with extensive large-scale laboratory investigation of building component performance under fire exposure conditions, has been the single largest contributor to our current understanding of infrastructure impact in bushfires. These initiatives will be built upon with our strong participation in the newly formed Bushfire CRC.
2. *Fire growth and control*—including fire growth in buildings and transportation, production of gases and smoke spread, and active and passive fire controls. This project uses full-scale fire experiments to better understand the fire behaviour in buildings and transportation systems; validation and modifications of fire models for better prediction of fire behaviour; and the development of fire control strategies. This project uses the facilities at Highett (Victoria), as well as other off-site large-scale fire test facilities. Collaborators in this project include BRANZ (New Zealand), University of Canterbury (New Zealand), Carleton University (Canada); CFA (VIC) and Victoria University of Technology (Melbourne).
3. *Material flammability*—this includes the study of the fire behaviour characteristics of materials such as ignition, heat release rate and formation of combustion products; fire retardants; and looking at the underlying chemistry of combustion. The Material Flammability project studies all aspects of material flammability, from flame retardants to fires in buildings and transport.

More detailed descriptions are given at: www.cmit.csiro.au/research/special/fire-science/.

Fire Safety Engineering[14]

For more than a decade, the CSIRO Fire Safety Engineering (CFSE) team has applied its global presence and expertise to complete high-profile projects, from major projects in Shanghai, New Delhi, Hong Kong, mainland China and Malaysia, to the Melbourne, Sydney and Brisbane International Airport terminals, the Myer Centre in Melbourne Central, and Westfield's new flagship shopping centre at Bondi Junction in Sydney. Other projects range from water treatment plants to massive high-rise buildings.
With its own expertise and in combination with CSIRO Fire Testing & Assessments and CSIRO Fire Science, the CFSE Team provides fire safety consulting for building, transport and industrial fire safety.

[14] http://www.cmit.csiro.au/brochures/key/firesafety/.

Fire Testing and Assessments[15]

CMIT has developed comprehensive fire testing and assessment facilities. This project involves the testing, design and research of building elements related to their fire resistance when tested to Australian, British and international standards.

The range of tests include:

- Fire resistance of walls, floors, doors, dampers, shutters, ducts, columns, roofs/ceilings, penetrations, windows and glazing, and other elements of construction.
- Spread of flame tests on building materials and textiles/furnishings.
- Smoke developed or emitted tests on building materials.
- Combustibility of building materials.
- Fire performance of smoke and heat release vents.
- Air leakage of smoke doors and dampers.
- Effectiveness of drencher heads for external protection of facades.
- Hot smoke tests for installed smoke control systems.
- Room fire tests.
- Rate of heat release.

This group works to provide commercial services to clients but can pass on the information gleaned to the research group and benefits also from the expertise within the DFSE Team.

The Future

CSIRO has vast capabilities within its CMIT Fire Science and Technology Laboratory (FSTL) group. Its fire expertise consolidates a broad range of fire research activities into an integrated team (located in Sydney and Melbourne) that can coordinate research and address various fire safety issues.

The Bushfire CRC is also an exciting initiative that brings together researchers and their expertise from Universities, CSIRO and other government laboratories, and private and public sector agencies, including emergency services.

CSIRO Information Services, formerly the CSIRO library network, has been at the leading edge of the provision of information to its primary users using the current and innovative technologies.

In the case of fire research, information provision has been greatly enhanced by the knowledge, expertise and strength of fire collections and expertise available through the inFire network.

With these information networks in place, the new fire facilities in Sydney and the major role being played by CSIRO in the Bushfire CRC, the benefits for a safer environment from fire research augur well.

[15] http://www.cmit.csiro.au/brochures/key/firetesting/.