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# Cooperative Disaster Salvage and Recovery in Aotearoa New Zealand: a case study of vacuum freeze-drying services

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**Abstract:**
The New Zealand library and archives sector has experienced a variety of attempts to develop regional and national cooperative programmes for disaster response. The success or failure of such cooperation has mirrored other aspects of cooperation across the sector, as well as the interest and ability of the larger institutions to support such initiatives. However, for the last fifteen years one ongoing success has been the provision of vacuum freeze drying services to recover water-damaged paper-based materials.

Both the National Library of New Zealand and Archives New Zealand (the national government archives) have vacuum freeze-drying facilities. Both facilities have been used to deal with occasional small disaster incidents affecting the institutions' collections, as well as more frequent recovery of water-damaged materials from the wider community. The institutions cooperate in providing this community service, and a case study of a year-long cooperative project in 2004/5 is used to demonstrate this cooperation. The experience of the National Library of Australia with a similar freeze-drying facility is contrasted with the situation in New Zealand.

This experience highlighted problems with disaster preparedness planning across the wider New Zealand library and archives sector, and the need for comprehensive advice and support to prevent or reduce damage as well as the freeze-drying service. A similar need has been identified in our wider Pacific community, where support for disaster planning and assistance with disaster salvage for the smaller Pacific Island nations has always been tied to aid programmes, and reactions to specific disaster events such as individual cyclones.

The National Library of New Zealand and Archives New Zealand are using the successful joint freeze-drying service as a model for future cooperation and development of sustainable support for national and regional disaster planning. With this model two large institutions have identified the need to establish freeze-drying facilities as part of their internal disaster planning. Extending access to this service to the wider community has enabled the institutions to maintain staff expertise, and fund upkeep and maintenance of the facilities. In this case, even if the institutions were not interested in the greater community benefit, there are practical business reasons for providing wide access to the service.

The two institutions have started a project to provide information leaflets and pamphlets targeted to different parts of the sector, drawn from the information compiled and updated to produce and support internal disaster planning and staff training. It is planned to include review and updating of these publications as part of regular institutional disaster planning programmes. This approach will reinforce the need to review and update internal disaster plans, as well as ensuring that advice to the community is also current and relevant. The first to be completed is a joint freeze-drying services leaflet.

## Introduction

It is difficult for libraries and archives to develop and maintain effective disaster preparedness and response programmes, with so many other demands on time, operational funding and other resources. It is the same in the wider community, where interest and support for civil defence programmes will peak after a dramatic disaster incident, but then decline as memories fade. Attempts have been made to develop regional and national cooperative programmes for disaster response among libraries and archives in Aotearoa New Zealand since the early 1980's. The success or failure of such cooperation has mirrored other aspects of cooperation across the sector, as well as the interest and ability of the larger institutions in supporting such initiatives. However, for the last fifteen years one ongoing success has been cooperation in providing vacuum freeze drying services.

The National Library of New Zealand Te Puna Matauranga o Aotearoa installed a large freeze-drying chamber in the new Wellington Library headquarters building in 1987. The decision for this investment was in part as a result of discussions with the National Library of Australia. The NLA had developed an in-house freeze-drying facility in response to a review of disaster preparedness and response programmes after a major fire in 1985. In making this decision the National Library of Australia[1] took into account a number of factors including:

- The established use of the technology to safely dry large amounts of wet paper-based materials.
- The scarcity of large vacuum freeze-drying facilities in Australia, even for use in industries such as food processing and pharmaceuticals.
- The international scarcity of technicians and commercial providers of specialised disaster recovery services for library and archives collections, with none permanently based in Australia.

These same factors were seen to apply in New Zealand, which is much smaller and even more isolated. Another factor that influenced the New Zealand decision was the absence of state or provincial authorities in the country, with central government agencies taking the responsibility for regional support. This meant that the National Library had a number of regional service centres, and a responsibility to provide support for public and school libraries across the country. A vacuum freeze-drying facility would be another regional support service, as well as part of the protection of the Library's collections including the Alexander Turnbull Library's New Zealand and Pacific documentary heritage collections.

National access to freeze-drying services was enhanced in 1991 when a smaller but more versatile chamber was installed in the nearby Archives New Zealand head office building. Both facilities have been used to deal with a few small disaster incidents affecting the institutions' collections, and more frequently for the recovery of water-damaged materials from the wider community. The value of cooperation was recognised from the outset, with the Archives deliberately purchasing equipment to complement and not duplicate the Library

chamber capability. A good example of effective cooperation and use of this technology was the major joint project carried out in 2004/5.

## CASE STUDY: 2004/2005 JOINT FREEZE-DRYING PROJECT

### THE DISASTER

February 2004 saw extensive regional flooding in the North Island of New Zealand, including parts of the Hutt River valley in the Wellington metropolitan area. A commercial records centre in a river-side industrial park near Wellington harbour was flooded with up to a half metre of brackish river water that affected the lowest two boxes on the bottom tier of industrial shelving. Some wet boxes collapsed tipping the boxes above into the water, and incoming and outgoing material on pallets and in work areas was also badly affected.

Over 3400 cartons of wet material belonging to clients including local hospital boards and several central government departments were salvaged over the next fortnight by records centre staff. The material was removed from wet and collapsed cardboard record cartons and placed in stackable plastic fruit bins. One bin was used for each carton of files and volumes, with the file control barcode from the old box taped to the bin for identification. Eighteen industrial freezer-shipping containers were filled with these stackable plastic bins.


As is common with commercial records centres in New Zealand, insurance for records stored at the centre is the responsibility of the client, not the records centre.
Many clients were not insured so were forced to make their own decisions and arrangements. However, insurance companies representing the major insured clients and about 40% of the salvaged material decided to work together to develop a joint recovery project. These clients were primarily the affected central government departments. The insurance adjusters asked for expressions of interest from commercial disaster salvage companies.

Regenisys Ltd., one of the disaster salvage companies interested in the project, approached the Library for advice on the work programme. The size of the drying project and the involvement of large amounts of public records and archives required the immediate involvement of Archives New Zealand. The joint tender proposal developed by the NLNZ and Archives NZ with Regenisys was accepted by the insurance consortium, and work on the year-long project began in June 2004.

**PROJECT MANAGEMENT STRUCTURE**

While Library and Archives preservation staff were skilled in the technical operation of the freeze-drying equipment and the management of workflows in the facilities, they had relatively little experience with large-scale project management of this kind. Regenisys' role in the project was the crucial overall project management and coordination, including:

- Liaison between insurers, clients (owners of the records), the freeze drying contactors and the records management companies

- The development of a central freezer store to replace the freezer containers, identification and organisation of the frozen material by client/owner, and sorting material into freeze drying loads

- Development and management of a reliable production schedule. This schedule extended 10 months taking into account a load capacity of 50-70 plastic crates per week, and the need to rotate loads between clients so each had access to some records over the project.

The Library and Archives designated the Library's Manager of Preservation Services to provide coordinated management of both freeze drying facilities for the project, and to carry out all liaison with Regenisys. In addition, it was decided to hire and train contract operational staff for the project since neither institution could afford to have all preservation staff committed to freeze drying work for such a long period.

Both freeze-drying facilities were used for the project. The larger Library chamber was built in 1987 by Cuddons, Ltd. of Blenheim, NZ as a prototype based on freeze dryers built for food processing. It is a built-in unit with external machinery and controls, and has a capacity of 50-60 records cartons per load. The smaller Archives chamber was installed in 1991, and was produced by Cuddons, Ltd. as an established production model with adaptations for this application. It is a self-contained unit with integrated controls and machinery, and can be moved with a crane truck. It has a capacity of 10-20 records cartons per load

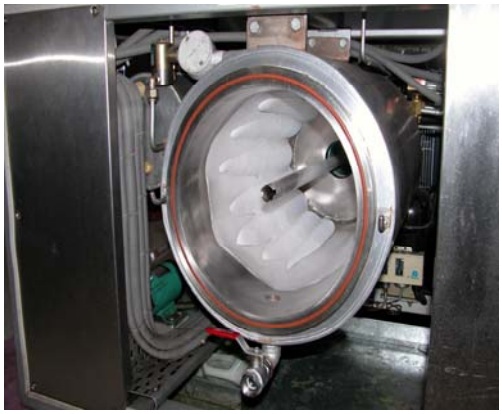
Book Conservator Stephen Williams was employed for 30 hours/week as the production supervisor to:

- Carry our everyday liaison with the Regenisys site manager and Archives
- Supervise scheduling and loading/unloading
- Operate and monitor both chambers
- Arrange pick up of completed material by records management companies
- Complete documentation

Three Project Technicians were employed full time by the Library, but spent on average 20 hours/week working on the project during loading and unloading work.

# NATIONAL LIBRARY CHAMBER

# ARCHIVES NEW ZEALAND CHAMBER



## VACUUM FREEZE-DRYING TECHNOLOGY

Vacuum freeze-drying uses sublimation to dry the wet material. Wet, frozen items are placed on racks in the chamber, then the chamber is sealed and the air evacuated creating a vacuum. The racks are heated causing the frozen water in the material to go directly from the solid (ice) phase to the gaseous (water vapour) phase. The water vapour is then condensed as ice on condensing coils either at the bottom of the chamber or in a separate condensing chamber.

The advantages of using this technology include:

- No further damage to soluble inks/colours than occurred before salvage
- Minimisation of distortion & pages sticking to one another
- Mass treatment potential

Disadvantages include:

- The wet material must be properly packaged prior to freezing
- Problems with mixed sizes and types of material that dry at different rates
- There is a lack of fine drying control, especially with the large Library chamber

## PREPARATION FOR FREEZE DRYING

There are a number of actions that must be taken before material arrives at the chamber to ensure effective freeze-drying.

**1. Flash freeze the material as soon as possible after the incident**

- Reduction in risk of mould and microbial growth
- Reduction of distortion and pages sticking together due to partial and uncontrolled drying
- Smaller ice crystals produce less distortion.

**2. Maintain the frozen state**

- Freeze/thaw cycles allow liquid water to act as a solvent
- Partial drying can occur with resulting increase in distortion and sticking together of pages

**3. Limit the size of frozen units, and keep as uniform as possible**

- Variation in size of frozen blocks means variation in drying
- Blocks over 90mm can't fit into Library fixed racks
- Possible over-drying of outer material in thick blocks

**4. Document variation in material type and wetness**

- Varying drying times
- Plastics cause problems, slowing or preventing drying

**5. Clearly identify and document each item or contents of each package**

- Permit sorting of material by priority
- Facilitate return of material to use

## PROCEDURES USED FOR THIS PROJECT

### 1. Delivery of frozen material

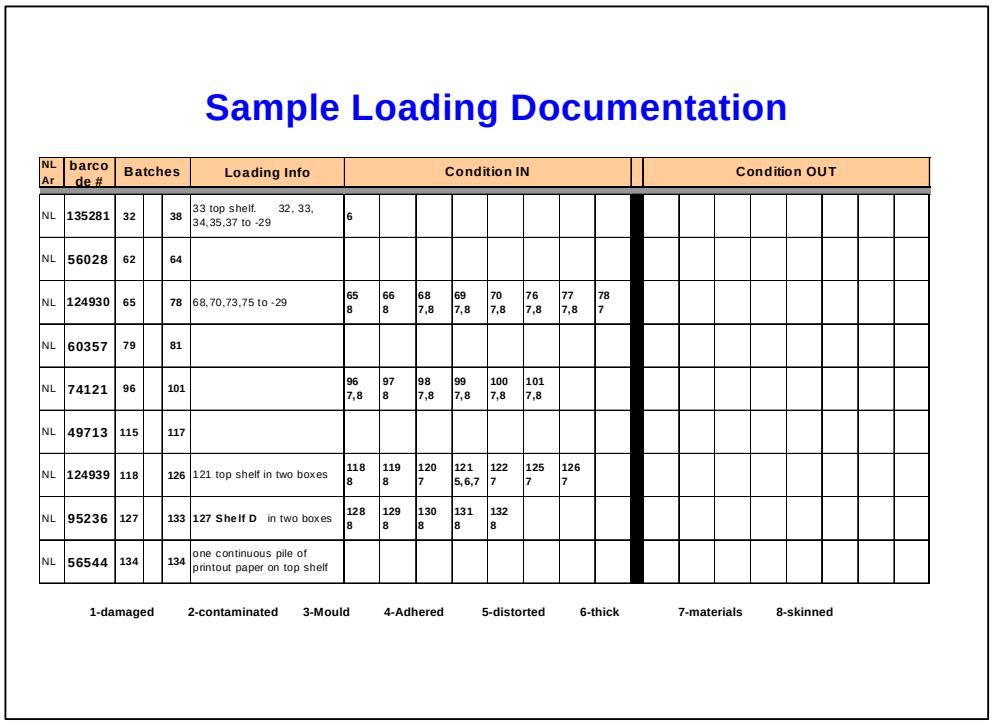
- The Regenisys site manager would schedule delivery of 50-70 crates of frozen material from the central freezer store to one of the freeze drying facilities
- With 10-15 minute delivery time from the store to either facility a freezer delivery truck was not needed as the material stayed frozen until loading
- Loads were made up of material belonging to one client

### 2. Documentation:

- Each plastic crate contained the contents of one records carton of salvaged material, labelled with the records company barcode cut off the old box.
- This barcode was used as a reference number on the documentation form so the material could be separated into uniform batches for loading.
- Files, small volumes and loose documents were placed in labelled paper bags.
- Small paper tags with batch numbers were attached to each paper bag, volume or other batch unit.

The loading documentation form example below illustrates the following information:

- Column 1: NL or Archive chamber load
- Column 2: Barcode number from the plastic crate
- Columns 3 & 4: How many batches were made from the crate---eg paper bags, volumes---identified by a paper tag with batch number
- A section to indicate location ----where the batch lot was loaded into the chamber on numbered racks, or other movement.
- A section for condition notes prior to loading---see key at the bottom of the page
- A section to note any changes observed during unloading



**Sample Loading Documentation**

| NL Ar | barcode # | Batches | | | Loading Info | Condition IN | | | | | | | | Condition OUT | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NL | 135281 | 32 | | 38 | 33 top shelf. 32, 33, 34,35,37 to -29 | 6 | | | | | | | | | | | | | | | |
| NL | 56028 | 62 | | 64 | | | | | | | | | | | | | | | | | |
| NL | 124930 | 65 | | 78 | 68,70,73,75 to -29 | 65 8 | 66 8 | 68 7,8 | 69 7,8 | 70 7,8 | 76 7,8 | 77 7,8 | 78 7 | | | | | | | | |
| NL | 60357 | 79 | | 81 | | | | | | | | | | | | | | | | | |
| NL | 74121 | 96 | | 101 | | 96 7,8 | 97 8 | 98 7,8 | 99 7,8 | 100 7,8 | 101 7,8 | | | | | | | | | | |
| NL | 49713 | 115 | | 117 | | | | | | | | | | | | | | | | | |
| NL | 124939 | 118 | | 126 | 121 top shelf in two boxes | 118 8 | 119 8 | 120 7 | 121 5,6,7 | 122 7 | 125 7 | 126 7 | | | | | | | | | |
| NL | 95236 | 127 | | 133 | 127 Shelf D in two boxes | 128 8 | 129 8 | 130 8 | 131 8 | 132 8 | | | | | | | | | | | |
| NL | 56544 | 134 | | 134 | one continuous pile of printout paper on top shelf | | | | | | | | | | | | | | | | |

1-damaged 2-contaminated 3-Mould 4-Adhered 5-distorted 6-thick 7-materials 8-skinned

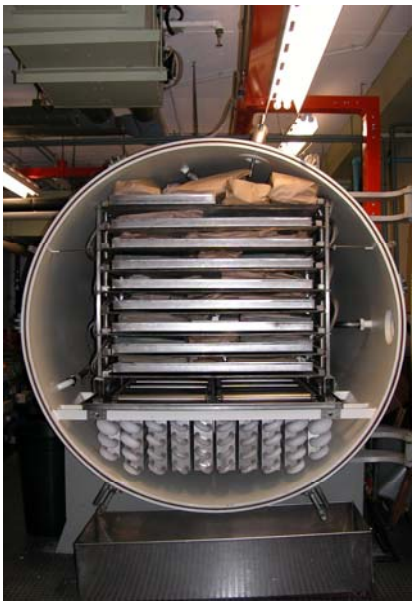
Examples of the most common materials that were freeze dried included:

- Large bound volumes such as ledgers and registers
- Docketed files in envelopes
- A range of standard files & loose documents

There were also a few examples of non-paper media formats as well such as microfilm, audio and video tapes, and floppy disks. These were separated out and either processed by Regenisys staff, or through other specialist contractors at the end of the project.

**3. Drying**

When material had been documented, and separated as much as possible into uniform sized stacks, it was loaded into metal trays. These trays were then slotted into racks in the chamber. The time required for processing a full load in either chamber varies between 3-7 days depending upon the wetness & size of the blocks of frozen material. Temperature sensors are placed in two representative batches to monitor the drying rate. The temperature of the material will rise as it dries and the ice disappears from the paper.



**Loaded Library Chamber**

**Loaded Archives Chamber**

At the completion of the drying cycle the material was removed from the chamber. Any condition changes were noted on the documentation, and the loading batches were reunited in new cartons supplied by the owner or their records management company. The old barcode is taped inside the lid of the new box.

There are differences in the operation and use of the two different freeze-drying units. The Library chamber was able to accommodate much larger loads of uniform material, with trays slotted into racks with a 90mm clearance. While the smaller Archives chamber has only about 25% of the capacity of the Library chamber, an adjustable rack system is able to accommodate thicker stacks of material and larger volumes more than 90mm thick.

The Archives chamber could also deal more efficiently with extremely wet material, or loads with large variations in wetness. As material dries moisture condenses as ice on condenser coils visible through observation ports. When the ice gets too thick drying efficiency falls, and the ice build up must be removed. This is a simple process with the Archives unit that has a separate condensing chamber that can be locked off and cleared of ice without disturbing the main chamber. However, the Library chamber has to be shut down completely and opened up to remove the ice since the condenser coils are at the base of the chamber. Material that is still not dry may need to be removed to freezer storage until the chamber is cleared of ice.

## 4. Return to clients

After drying and repackaging was complete a load report was produced for Regenisys and the owner of the material noting condition on arrival, any changes noted after drying (rare), and any recommendations for further treatment. Recommendations for further treatment were seen as particularly important for the large amount of government agency material that was of permanent archival value, and where silt or other deposits might pose health risks or otherwise affect the use of the material.

# Sample Report

**Report on the condition of Stillage 015841.**
Processed at : National Library.
Time / date of arrival : 1000, Monday, 18th. April, 2005.

**Condition on arrival :**

- The 28 crates arrived in a satisfactory frozen condition.
- As well as the 40 crate barcodes listed, there were an extra fifty-eight volumes, each with their own barcodes.

**Freeze drying :**

- File materials in this stillage included loose papers held by elastic bands, split metal tabs and in coated card folders. There was also one large computer printout volume.
- The majority of the stillage was made up of large bound register-type volumes. These as seen in previous stillages, had been in a very bad condition pre -flood, after having had their pages cut and torn out of the binding structures ( for copying?).
- Damage caused by the flood consisted of some warping to the boards, manuscript ink bleeding, colour run from some of the endpapers and silt deposits on the bindings.
- These volumes would require extensive conservation treatment to ensure long term preservation and access as the flood damage has significantly increased their already poor condition.

**Dispatch :**

- The contents of the twenty-seven crates were released to XXXXX Records Management Co. on 29 April 2005.
- The contents of one crate (056199) were released to XXXXX Records Management Co on 17 May 2005.

## PROJECT REVIEW

All of the flood-damaged material involved in this project was successfully treated, with everything returned to useful condition with little additional damage beyond pre-flood damage, or damage that had occurred prior to freezing. Because it was based locally, close liaison and working relationships could be developed between all of the interested parties including the clients/owners of the archives and records, commercial records management companies and consultants, and Archives NZ for affected central and local government agencies. Alternative proposals to freight the material in freezer containers to larger overseas facilities may have resulted in shorter processing times, but because of the need for close liaison the long-term completion of the recovery project would have been extended.

The biggest factor influencing the overall recovery project was the significant loss of archival control and identification over much of the material. Some of this was due to the inevitable disruption because of dislocation during the flood and salvage. However, since all material was identified only by the records management company barcodes, flood damage to the records management company computer system prevented complete access to information about the records. Owners could not set priorities for material, and all material needed to be completely re-listed and labelled after freeze drying. In many cases the owner also decided to transfer the salvaged material to another commercial records management company, so the computer-based barcodes exclusive to the original records management company could not be used.

This situation also substantially increased the cost and time required for the recovery project, with resulting problems with business continuation for clients. Duplicates and other material not required to be kept still had to be processed, as pre-sorting by priority was impossible. The long period from salvage to completion of the recovery phase (February 2004 to May 2005) meant increased freezer storage charges and loss of access to the material.

## THE USEFULNESS OF VACUUM FREEZE-DRYING FACILITIES

This project has been a dramatic and successful example of cooperation in the use of freeze-drying facilities developed and maintained by two central government institutions. However, this approach to disaster recovery services or even the use of this technology is not necessarily a good model for others to emulate.

With limited resources for collection care and disaster preparedness, the substantial investment in freeze-drying facilities could be seen as unjustified. With the exception of small incidents affecting documentary heritage collections, the freeze-drying facilities have had limited use by libraries in New Zealand. Most public, school and university libraries faced with large-scale water or fire damage to collections have found it more cost-effective to use insurance payouts for replacement rather than recovery of book and serials stocks. By contrast, businesses and central and local government agencies have made more extensive use of the facilities to recover organisational records and archives that are unique and essential for business continuation. On average one or both facilities have been used 2-3 times per year for such projects, with charges set at a 'cost recovery' rate required by NZ government policy.
As an investment for specialised national support, the Archives could be said to have made a good choice in allocation of resources since the freeze-drying facility has wide application in the archives and records sector. By contrast, the Library investment is most useful only for the small number of libraries that hold special and heritage collection materials that are difficult or impossible to replace. The 1995 review of the National Library of Australia freeze

drying facility found that the equipment had not been needed for Library collections since it was installed in 1986, although it had been leased three times by private consultants to carry out projects.

One of the reasons for creating the freeze-drying facility in 1986 at the National Library of Australia was the scarcity of such facilities in the country. By the 1995 review commercial freeze drying facilities and disaster recovery services were found to be widely available in Australia, with at least two major international disaster recovery companies having opened offices in the country. In addition, the geographical size of Australia has meant that the time and expense of sending material to a central facility has not been economic for many potential clients. The dilemma for the NLA was whether to maintain an expensive in-house facility that has limited external use by the community or library sector, primarily as security for the protection of the Library collections. The recommendation of the 1995 review was that the NLA could make better use of resources to close the facility and contract services from commercial disaster salvage companies if a large-scale incident should occur. By 1997 this recommendation had been acted on, and the NLA contracted out the freeze-drying of 600 water-damaged items to a commercial company based in Sydney.[2]

Another issue of concern in both New Zealand and Australia is the need to support and improve disaster planning and preparedness in the library and archives sector. In the review of the joint freeze-drying project the National Library of New Zealand and Archives New Zealand noted that the damage to government records and archives could have been avoided if proper risk management procedures and disaster planning had been followed. The records centre clients had evaluated the commercial records centre involved only on the price structure and services offered.
Even basic risk analysis would have revealed that:

- The records centre building was located on in-filled swampland in a low-lying river flood plain with a history of flooding, as well as a few hundred metres from Wellington harbour and major fault lines.
- Senior records management staff were located in Auckland, several hundred kilometres away, and would have difficulty directing and supporting on-site staff faced with an unfamiliar situation.

With hindsight the affected government agencies were advised that disaster planning was as important for outsourced, as well as internal, archives and records management. The project review recommended that such planning should include:

- The use of risk analysis to select a good records centre.
- Development of a good records management contract that clearly outlines mutual responsibilities and actions in the event of problems.
- Development and maintenance of good records control systems that are accessible to the records owner as well as the contractor.
- The extension of corporate disaster planning to cover archives and records managed by a contractor.

The February 2004 disaster incident can be used to look at how well both institutions are fulfilling our wider responsibilities as national leaders in the archives and library sector in Aotearoa New Zealand. Questions we have asked included:

- Why did the central government agencies involved in this disaster make such poor choices, despite being located in the New Zealand capital with easy access to advice from both the Library and Archives?

- Have we been putting resources into salvage and recovery facilities that would be better spent on education and support on the prevention or reduction of the effects of disasters?
- How could we build on our experience with cooperation in freeze-drying services to develop a wider support for national and regional disaster preparedness?

Comprehensive support for disaster preparedness planning across the wider New Zealand library and archives sector has been sporadic over the last twenty years, and assistance with actual disaster salvage has only occurred when resources could be negotiated at the time of the incident. The same situation has prevailed in our wider Pacific community, where support for disaster planning and assistance with disaster salvage for the smaller Pacific Island nations has been tied to aid programmes or reactions to specific disaster events such as individual cyclones. Both the National Library of New Zealand and Archives NZ would like to improve this situation, but we also want to ensure that this improvement is long-term and sustainable.

The freeze-drying service model has proven to be successful and sustainable, so we have been examining the reasons for this success. In this case two large and relatively well-resourced institutions have identified the need to ensure that freeze-drying facilities are accessible for their own collections. Extending access to this service to the wider community has enabled the institutions to maintain staff expertise, and fund upkeep and maintenance of the facilities. In this case, even if the institutions were not interested in the greater community benefit, there are practical business reasons for providing wide access to the service.

We have been looking at how this approach can be applied to the development of wider disaster planning and response programmes and services. Both our institutions are committed to developing and maintaining good disaster preparedness programmes, but because large-scale in-house disasters are thankfully quite rare, it is difficult to ensure that staff are well trained, and that theoretical disaster planning concepts are well tested. If we invest more of our resources into national disaster planning programmes, and the development of comprehensive disaster assistance services for other institutions, we will also be investing in our own internal disaster preparedness. In addition, by encouraging the ongoing growth of disaster response expertise and facilities elsewhere in Aotearoa New Zealand we will also be building resources that could be important for the salvage of our collections in the event of a large-scale regional disaster affecting Wellington. Our city is after all in one of the most seismically active regions of a country located on a major plate boundary, uncomfortably close to pyroclastic volcanoes, and exposed to a turbulent ocean.

Preservation staff at the National Library of New Zealand and Archives New Zealand have started acting on the idea of building on our freeze-drying service cooperation by looking at joint development of publications for various aspects of disaster planning and response. The first of these has appropriately been a joint leaflet on freeze-drying services that also provides basic information on immediate salvage procedures, and is available both in printed form and on our respective websites. Development of this publication could easily be supported as a marketing tool, and we will be able to justify regular updating as long as we continue to provide cost-recovery freeze-drying services.

Our next project is to use our internal disaster planning programmes to develop a pool of information that can be used to produce other disaster planning and response publications. We have decided to develop a series of small publications designed to target various parts of the library and archives sector, rather than one comprehensive publication that tries to cover all needs. We feel that these will be much easier and less expensive to update on a regular

basis, so we will be more likely to do so. Since the information will be drawn from areas in our own disaster plans that also need regular review and updating, we will have more than one reason to incorporate updating into our normal work programmes.

We are just starting this experiment in sustainable disaster preparedness. If successful this approach will both build better disaster preparedness programmes for our two institutions, and encourage similar development across the library and archives sector in Aotearoa New Zealand.

**References:**

1. '*A Vacuum Freeze Drier: It's nice to have but…A short paper on the National Library's vacuum freeze drier nine years on.'* Kim Morris: Staff Papers/1995 on *www.nla.gov.au*.

2. *'Learning From Disasters: A decade of experience at the National Library of Australia.'* Lydia Preiss: Staff Papers/1997 on *www.nla.gov.au*.

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