

Recovering the Collection, Establishing the Archive

A case study on the recovery of Eyebeam Art+Technology Center's multimedia collection following Superstorm Sandy

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Introduction

This paper was intentionally posted several months after the disaster it references.

The purpose of this case study is to share Eyebeam's experience during Superstorm Sandy with cultural heritage institutions in the hope that it will be of benefit as organizations consider preparing for future disasters. Immediately following a disaster on the scale of Superstorm Sandy there is a sense of urgency; a need to identify what went wrong and how to prevent it from happening again. Or at least, to mitigate the damage when the next storm, flood, fire, or burst pipe occurs. This adrenaline rush is short lived. Several months later, we collectively return to our normal routine and give blissful little thought to disasters.

I hope that this resource will serve as a reminder to archives, caretakers, curators, stewards, and others responsible preservation of content that our work on this front is not, and never will be, done. Disaster preparedness is an ongoing task; there is no starting and stopping point. Disaster plans need to be created, tested, revised, tested, and revised again. Immediately following an emergency we swear up and down that we are going work on those disaster plans. Several months later, how many of us have? What about a year from now? Unfortunately, disaster planning is an out-of-sight, out-of-mind collection management task, and moves lower on the priority list as day-to-day tasks take precedence. This is unacceptable. The cultural heritage community is responsible for the preservation of collections for the long term; we absolutely cannot afford to get stuck in a short-term mindset. Our horizons must by nature be long. I hope this story provides impetus to take the necessary actions.

Another lesson I hope this case study will reiterate, specifically to those with audiovisual and digital collections, is that none of this type of damage has to occur to collections if organizations enact and support basic preservation policies. For organizations charged with preservation and archiving this is tantamount to meeting your obligations. Analog and physical materials are obsolete—in order to be preserved, the content on these containers need to be migrated to the digital file-based domain. Once in a file-based format, simply following IT best practices, namely, backup and geographical separation of copies, content will be protected from disasters. Data centers are often used as “disaster recovery” sites for that reason, and they successfully serve their purpose for organizations on a daily basis.

If a disaster occurred today, and our valuable collections were flooded with saltwater and sewage, we would do everything in our power to recover them. Money would be no object, or at least, we'd try to find a way. That's the expensive option, and will almost certainly guarantee a degree of loss. Why don't we put our resources into doing things correctly in advance? Preparing for the eventual disaster, so that when the time comes, we can breathe a sigh of relief and get to work restoring the data from those offsite disaster recovery centers.

The Disaster

0 hours

On October 29, 2012, “Superstorm” Sandy took aim at the New York City region. As residents braced for high winds, rain, and potential flooding, low-lying zones were evacuated and the city’s subway system was shut down. The prevailing belief at the time, like Hurricane Irene the previous year, assumed there would be little damage and everyone would be back at work on Tuesday. Yet, despite urgent warnings, disaster plans were sporadically put into effect, and many people even chose to ride out the storm in their coastal homes.

Sandy made landfall on the Southern New Jersey shore at the exact hour of high tide, higher than usual due to a full moon. Instantly, the waters rose. The storm surge topped the city’s barriers, inundating numerous neighborhoods, including the gallery district of West Chelsea in Manhattan.



West Chelsea, Manhattan, via Google Maps

12 hours

Eyebeam Art+Technology Center sits between 10th and 11th Avenues on West 21st Street. Standing in front of the building, it seems unimaginable that the water from the Hudson River, about a block away, on the other side of a highway, could flood this location with any significance. Eyebeam had about three feet of water on the ground floor of its space, as evidenced by a dirty waterline visible along the white drywall after the water receded.

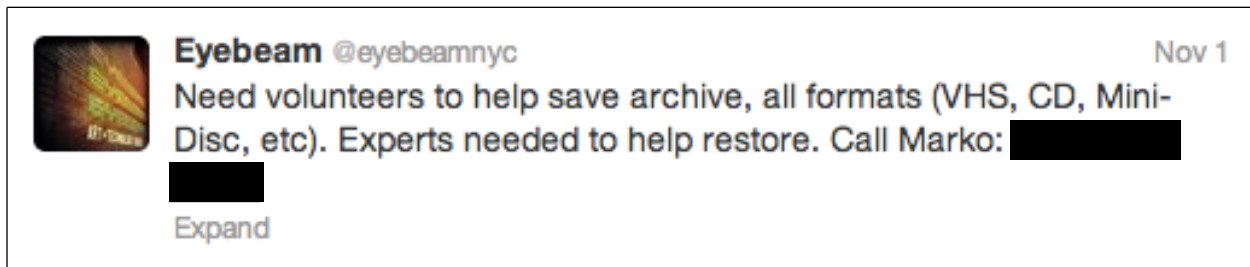
While some minimal preparations were made, such as covering workstations in plastic and raising equipment and materials a couple of feet off the floor on the ground level (there was nothing stored in the basement), these efforts were unfortunately not enough. The toxic mixture of saltwater, sewage, and other contaminants submerged everything in its path. Over \$250,000 worth of equipment—computers, lighting, printers, servers—was completely destroyed.

Amongst the damage was the majority of Eyebeam's media archive: 15 years of videotape and computer disks containing artworks, documentation of events, and even server backups—essentially, Eyebeam's entire legacy. Altogether, about 1,300 items were flooded and in urgent need of decontamination in order to be stabilized for eventual recovery.

Initiating Recovery

72 hours

On Thursday November 1, three days after the flood, Marko Tandefelt, Eyebeam's Director of Technology and Research, sent out an urgent plea via Twitter for expert assistance, "Need volunteers to help save archive, all formats (VHS, CD, Mini-Disc, etc). Experts needed to help restore."



Eyebeam's call for volunteers on Twitter, November 1, 2012

Erik Pii, Digital Archivist at Anthology Film Archives and Chris Lacinak from AudioVisual Preservation Solutions (AVPreserve) were the first to heed that call. With lower Manhattan still without power or public transit, Erik traveled by bicycle to Manhattan's west side on Thursday afternoon. Eyebeam staff had begun to separate media from containers to promote drying, laying out the collection on cardboard-covered floors and desks. A few feet away, building recovery crews were beginning to demolish dry wall and prep for power washing. Responding to the imminent risk of being in a demolition zone, Erik pushed for recovery and stabilization of the media to begin immediately. He called AVPreserve, and Josh, Chris, and I agreed to meet him the following morning, 9am at Eyebeam. We would gather whatever supplies we could and bike over.



State of the collection on Friday morning

96 hours

Note: Health and safety is priority #1. Use your best judgment to gauge the structural integrity of the space you are working in before and while working. Be aware of the risk of electrocution in areas with standing water. To mitigate the risk of airborne and other pollutants, at minimum you should wear an N95 respirator mask and rubber gloves. For more information see <http://www.nycosh.org>

When we arrived Friday morning with gloves, masks, and a few other supplies in hand, the demolition crews were already at work, tearing down drywall and power washing floors. Eyebeam was still without running water or power and the only lights were for construction crews, powered by generators. Plaster chunks and other particulate were raining down on exposed tapes and disks. It was urgent to move the media immediately to a safe and secure area, away from the restoration crew, ideally a well-ventilated

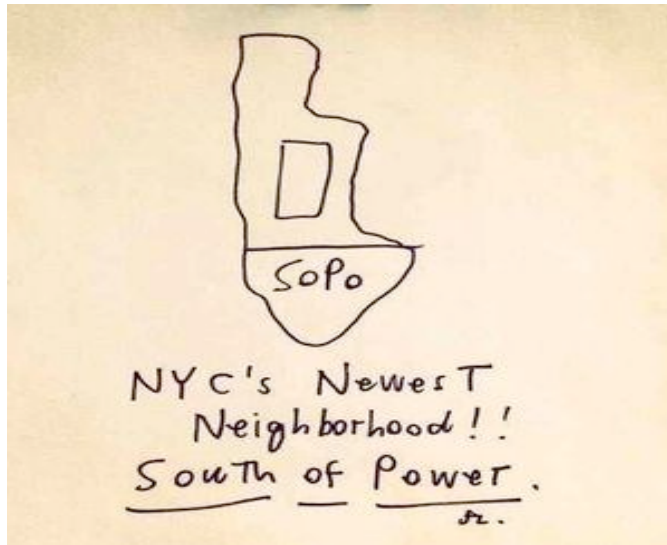
area (we knew right away that avoiding mold growth was a high priority). It was also important to keep separated cases and media together in case there was critical identifying information.

There wasn't enough time to try to find a space off-site, and regardless, the collection was too large to move out of the building given the logistical challenges of the neighborhood. A large room on the 2nd floor was identified as a safe holding space. Tables, desks, and shelves were cleared, cleaned, and covered with plastic to make way for the wet media objects, but more surface area was needed. Metal shelving units and baker's racks that had been submerged in floodwaters were scrubbed down with industrial strength cleaner provided by the demolition crew, then covered with plastic sheeting.

By 10:0am, media was being moved while surface cleaning and prep work continued. In order to move 1,300 items and their associated cases (when separated) quickly and safely, a few flat, stable transport surfaces, such as postal crates, were located. A few additional volunteers appeared around this time, and got to work moving tapes and disks upstairs. Within an hour or so, all media had been moved.

Planning Cleaning and Stabilization

Lesson 1: You can't put volunteers to work if you don't have anything for them to do.



*SoPo illustration by Jake Levine, who coined the term. As reported in *The Atlantic Wire* on November 2, 2012. <http://www.theatlanticwire.com/national/2012/11/sopo-coining-neighborhood-name/58639/>*

Calls for volunteers were put out on social media, along with e-mailings to the NYU Moving Image Archiving and Preservation (MIAP) and Eyebeam alumni lists. Volunteers began to trickle in, ready to be put to work. This was one of the first big lessons of the recovery effort: you need to be able to put volunteers to work in an organized and effective way. If you can't, there is nothing for them to do. It became evident why volunteers were having such a hard time finding ways to help in badly flooded neighborhoods such as Red Hook, the Rockaways, and in Staten Island—there hadn't been time or means to organize volunteer labor. We recognized that this could be a problem even with our comparatively small number of volunteers. In order to successfully clean and stabilize the collection, we needed a scalable and

adaptable workflow that would work with however many people we had on hand, we needed supplies, and we needed a plan.

Supplies

In true NYC fashion, Manhattan below 34th St was dubbed SoPo (South of Power). Not a desirable place to live in the first days after the storm, SoPo had no traffic lights, public transit, or open shops; it was an eerie post-apocalyptic ghost town. To get supplies, someone needed spend several hours attempting to reach a large hardware store in NoPo, the nearest of which was several miles, and a difficult cab ride away. Luckily, Marko was willing to make the journey and purchase needed supplies. This was fortunate, since he had the authority and means to spend money in this situation—a critical component to initiating recovery. In the meantime, we could begin planning the cleaning process. Knowing this was potentially our only opportunity to get necessary supplies in bulk, we had to think fast.

We took stock of **what we had on hand**: rolls of plastic sheeting, tables, shelves, a few pairs of gloves, some brown paper, a flip chart, 1 roll of paper tape, a few Sharpies, garbage bags. Then considered **what we needed**: EVERYTHING! Our order included gloves (4 boxes), masks (4 boxes), paper towels (lots!), microfiber towels (lots), headlamps (x3), isopropyl alcohol (10 bottles), distilled water (24 bottles), large shallow plastic under-the-bed bins with lids (x6), jewel



Salty Mini DV tape prior to cleaning.

cases, Q-tips (2 boxes), notepads, buckets (x6), Sharpies (x12), pens, paper tape (x3 rolls), and gaffer tape (x2 rolls). When Marko and a volunteer returned about three hours later, we were well equipped with nearly everything except the most crucial element: distilled water. We had about 4 gallons; enough to get started, but knew we would run out quickly. (*Note: It is very hard to find distilled water in a disaster zone, where there is a water shortage, and people need water for drinking and cleaning themselves!*)

Once we had most of the supplies in order, we were ready to finalize the cleaning procedures and workflows, and put people to work. Over the next day or so, we managed to get by with the water we had, and with volunteers bringing a gallon here and there. Finally, Chris Lacinak drove 24 gallons in from Brooklyn on Saturday morning. Other supplies we continually ran out of over the next few days and had to regularly replenish: gloves, masks, paper towels. We needed lots of these, especially when equipping over 40 volunteers for several days.

Designing the cleaning and drying process

Media items were still wet with the floodwater and needed to be cleaned as quickly as possible. Corrosion from the salt was already visible on metallic parts. The large quantity and diversity of media types meant different processes had to be developed for types of media with shared physical characteristics (e.g. optical discs, DV formats, data tape). Given the number of items and resources available, there was no way to do detailed work on each item in the initial effort. The goal, at this point in the recovery process, was to prevent further damage from contamination prior to any subsequent stages of conservation by removing the contaminated water from the media and associated containers, and then air drying them. The processes needed to be designed to maximize the impact of treatment per item, all while being administered by volunteers with mixed levels of knowledge regarding conservation or media handling.

Unfortunately, there was no way to prioritize by media type or content at this stage. Eyebeam had no catalog or inventory of the holdings, and no staff member with knowledge of institutional history was available that day (*Note: When there is an area-wide disaster, people are busy putting their own lives back together.*). Therefore, from an intellectual content perspective, all items were essentially treated as equal.

Thanks to the expertise of Chris and Erik, media-specific cleaning plans were developed according to the following groupings:

- Optical discs
- Computer discs
- Cassettes:
 - ▶ MiniDV, DVCAM, DLT, VXA (data tape)
 - ▶ VHS, Betacam, Digital Betacam

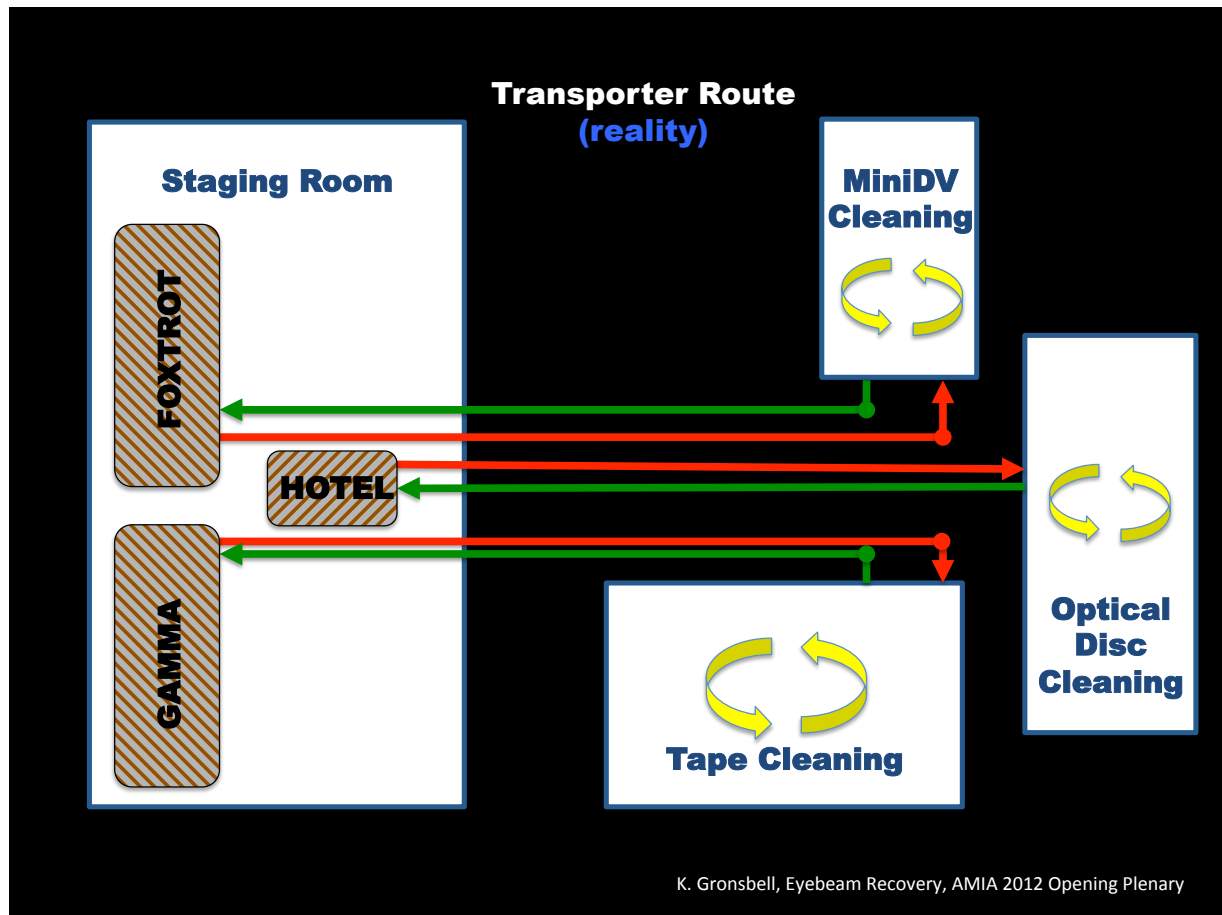
The processes were documented on large flip-chart paper and taped to the wall for easy reference. Over the next few days, Erik, Chris, and I conducted tests on sample media items to see how the cleaning methodologies affected different media types. Modifications were made as needed. For example, in initial workflows MiniDV tapes were to be submerged in distilled water. However, the process was modified, clearly documented, and communicated to volunteers after tests revealed that submersion was promoting the removal of a significant amount of oxide from the exposed areas of the tape.

Cleaning processes for some of the media types are detailed in Appendix A.

Space

Eyebeam made their clean and dry workspaces on the second floor available for the recovery operation. The spaces were set up to maximize cleaning and avoid chaos. There were initially 4, and eventually 5 rooms in use, each with a specific function:

- **Cleaning rooms:** Each of the three cleaning rooms was equipped with a clean water container for washing and dry container for expelling water and dirt. The clean water container was emptied and refilled frequently. Room was made for flooded items, which were brought into the spaces in bins labeled “dirty” and taken out in bins labeled “clean.” A solution of 2 parts water, 1 part isopropyl alcohol (95%) was mixed each day for each of the cleaning spaces and used to clean media cases and cassette shells. Paper towels and microfiber towels were placed in the cleaning spaces. The three cleaning rooms were divided into the following:
 - **Central space:** An open space between offices served as the largest cleaning area, and was used for mixed media. Everything except MiniDV tapes was cleaned here.
 - **MiniDV cleaning room:** MiniDVs were fragile and time-consuming to clean. A separate space was dedicated specifically to this format.
 - **Optical disc cleaning room:** On days when there was a large enough number of volunteers, one or two optical disc-only cleaning spaces were set up. These items could be cleaned quickly by two volunteers, greatly increasing overall productivity.
- **Supplies room:** One small office was allocated exclusively to supply storage, making it easier to locate supplies, monitor inventory levels, and prevent loss.



Cleaning workflow. Illustration by Kathryn Gronsbell.

- **Media storage room (waiting/drying room):** The largest room served as the media storage room for both items waiting to be cleaned, and those that had finished rewashing. This was the room where media was initially moved to from the ground floor. Immediately upon moving to this room, plastic sheeting was hung in the doorway to reduce the amount of particulate entering the room. Even after the power and heat came back on in the building, we set the thermostat in the room to 58°F. The aim was to prevent fluctuation of heat and humidity, which can cause expansion and contractions damaging to magnetic tape, as well as to avoid mold growth in the damp environment. We also kept a dehumidifier/air purifier running in this room to remove excess moisture and help remove particulate.

Despite the relatively large amount of space available to us, finding sufficient space was continually an issue. Once the media were separated from their cases and inserts, more space was needed to allow those items room to air dry.



A VXA data tape with a recovery identifier, intended to match it up with its case (labeled with the same id) after drying.

Workflow

One of the more carefully managed elements of the process was the workflow. Moving things from place to place during cleaning introduced a number of risks—including potentially dropping and damaging media, not keeping the cleaning stations constantly fed with work, mismatching tapes and cases, and more—all of which needed to be mitigated.

Cleaning proceeded table by table (or shelf by shelf, depending on the surface). Tables typically contained a mix of media types, with no intellectual or technical groupings. Items were loaded up into a “Dirty,” clear plastic (“under-the-bed” type) bin, and taken into one of the cleaning rooms. A “Clean” bin was placed at the end of the cleaning line. Volunteers performed cleaning according to the media type instructions. After the clean bin was full, it was taken back into the media storage room and set out to dry.

Tables and shelves were given names based vaguely off the NATO Phonetic

Alphabet: Alpha, Beta (through a miscommunication, a second B table was named Bravo), Charlie, Delta, etc. After all the dirty items were removed from the table, the plastic sheeting was removed, the table cleaned, and brown craft paper laid down. The paper would be labeled with the table name and the time that drying began. “Charlie Nov. 4 1:30PM” meant that the final item was laid out to dry at 1:30pm on November 4, and that the media should be given at least 48 hours for air drying.

Table names also served the purpose of providing identifiers for media items and associated cases and label inserts. In order to dry properly, associated items had to be separated from one another. To avoid dissociation, items that had multiple pieces had their identifier applied to each piece. The naming convention started with the first letter of the table name, followed by a number, e.g. A14. Numbers were incremented sequentially, and needed to be carefully monitored and documented to avoid duplication. The numbering system served the purpose of grouping multi-part items, so after drying they could be easily put back together. For example, if a CD was labeled A2, you could be 99% certain the CD case was on the Alpha table, and not need to search the entire room. Rigid adherence to this identifier system was one of the most important aspects of the effort: if an unlabeled MiniDV tape and its detailed paper insert were separated from one another, no one would ever know what was on that tape and whether it



Mini DV tapes laid out to dry after cleaning

should be prioritized for preservation. We constantly had to remind ourselves that while everything is of equal value at this stage, only select items would be restored. Allowing decision-makers the ability to make those selections down the road would be critical. It should also be noted how difficult it is to pull this off in a disaster scenario with thousands of items and 15 – 20 people working on something. The challenge this presents should not be underestimated or taken lightly.

Mobilizing Volunteers

Lesson 2: If you tweet it, they will come. (You CAN mobilize a volunteer recovery team using social media)

For cleaning to be completed within a few short days, approximately 12 volunteers were needed at a time. Thanks to the incredible efforts of dedicated volunteers over one very difficult weekend with limited public transportation to and from Brooklyn, this level of effort was sustained.

Volunteers were mobilized primarily through social media. Eyebeam (@eyebeamnyc) and the lead volunteer groups, including AVPS (@AVPreserve), and the NYU MIAP students (@AMIAatNYU), made initial outreach. The tweets spread like wildfire, and over the course of the weekend, over 40 people heeded the call and dedicated their time to help recover the archive. More people continued to join the effort by volunteering to help with the inventory of the media over a two-week period beginning the following Monday, after the initial cleaning stage was completed. Given the large number of volunteers that ultimately responded and came to support the recovery effort over the next few days, it was very important to track people and their work. Volunteers were signed in when they arrived, and their contact information was collected.

Among the volunteers were numerous current students from the NYU Moving Image Archiving and Preservation program, students from the NYU Institute of Fine Arts Conservation Center, former and current Eyebeam artists in residence, staff of local cultural heritage institutions (e.g. MoMA, local galleries), and even high school students. The volunteer force was a mix of skilled and non-skilled labor, all working tirelessly on tedious tasks to achieve a common goal.



Happy volunteers after the last item had been cleaned and laid out to dry. Taken on Sunday evening, November 4, 2012, by Jonathan Minard.

Roles and Teams

Lesson 3: You can utilize a volunteer recovery team that includes non-experts, as long as you have the right roles in place.

Cleaning and drying of 1,300 media objects and their associated containers, in about 12 different formats, can quickly become chaos. Ensuring that each volunteer is assigned a well-defined role is a critical step toward mitigating this risk.

It is important to understand the context we were working in: volunteers came and went as their availability allowed, meaning that there was little consistency from day to day, or even between morning and afternoon of the same day. Also, the number and diversity of media objects meant that the transport, cleaning, and drying process had to be efficient and consistent. As with any disaster recovery scenario like this one, the need for designated roles and associated responsibilities was of utmost importance in order for the operation to be a success.

The following roles were put in place:

- **Overall coordinator:** Oversees the entire operation. This should be someone from the organization who can unlock/lock the door, has the authority to make difficult decisions about prioritization or can liaise with content experts, and can authorize use of space. This person should either be able to spend funds as needed for supplies, or to easily



Volunteers cleaning and labeling cassettes

reach someone who can. The coordinator also manages security and makes sure there are no thefts or difficult people. In our case, this role was fulfilled by our fearless leader, Eyebeam resident Jonathan Minard.

- **Operations coordinator:** This role ensures the process flows by putting volunteers into the right positions, moving them around as needed, assigning new volunteers to teams, and training supervisors so they can train others. The person or persons in this role are also responsible for managing and tracking supply levels. This is the “go-to” role for any questions about the cleaning, transport, and labeling processes, as well as any media-specific issues. This person should have expertise in media conservation. This role was largely fulfilled by Kara Van Malsen (author of this document), with the support of Chris Lacinak.
- **Transport crew:** This group is in charge of table labeling, moving dirty media to cleaning rooms, cleaning and prepping tables, moving clean media into clean rooms, and setting media up to dry. They ensure that the cleaners have enough work to do, and generally keep things flowing by “feeding the machine.” This role requires knowledge of the entire process, and attention to detail. A team supervisor is instrumental in managing naming conventions and keeping track of what media has been moved. This group works very closely with all other teams; it is small, but important. We tried to have around 3 people in this group when operating at full capacity. Kathryn Gronsbell, NYU MIAP, did an



Conservation expert Erik Piil checking the results of the cleaning process for mini DV tape.

excellent job of managing the transportation crew on multiple days during the Eyebeam recovery.

- **Documentation crew:** This group is responsible for labeling media and related labels/cases that have been separated for drying. One documentation person per cleaning station is required at all times. They must keep track of table identifiers that have been assigned, and avoid duplication of IDs. The group works closely with, and may be supervised by the transport supervisor (this happened on occasion in our case). Kristin MacDonough, NYU MIAP, helped oversee documentation on a number of days, and continued in this role by volunteering to help with the inventory process that followed the cleaning effort.
- **Cleaning crew:** This group is responsible for cleaning the media and their cases according to specific instructions for each media type and ensuring that salt and contaminants are removed without putting the media at any additional risk. These people should be patient, able to perform rather detail-oriented but monotonous tasks, and keep track of tapes and their labels as cleaning is performed. As there were three cleaning stations going at the peak of the operation, the majority of volunteers worked in these areas. Dan Erdman, NYU MIAP, did a great job of supervising this area on multiple days.

- **Content experts:** These are current and former staff that can identify priority materials. Fortunately, a few former staff and residents were able to stop by on the second and third days of cleaning to help with prioritization and identification of duplicate and commercial items. While this did not result in a comprehensive prioritization of items, it certainly helped us determine what to clean first.
- **Media conservation experts:** Conservators design the cleaning procedures for each media type, test results, modify the process as needed, and provide oversight to cleaning of various media types. Erik Piil and Chris Lacinak expertly handled this task.
- **Quality Assurance and Control:** Although this was a function fulfilled by other roles described above, it is important enough to point out as a distinct role and need. We did not create this role in the beginning, but discovered the need to have routine and somewhat programmatic QC and QA throughout and to dedicate time to performing this task. This served as a major mitigation factor in managing the constantly revolving door of volunteers and navigating the mixed skill sets of the volunteers.

Continuity was important. Volunteers who came day after day and fulfilled the supervisory roles were instrumental to the overall success of the recovery effort. We quickly found that each area—transport, cleaning, and documentation—needed a supervisor who understood the process and the risks well, could perform quality control tasks, was patient and organized, and could train and delegate to others. Supervisors helped improve the processes in areas they were responsible for.

Additionally, because different volunteers rotated in and out within a day and from one day to the next, there was a risk that critical knowledge would leave with the outgoing person and not be transferred to the incoming volunteers. Descriptions of tasks for each of the workspaces were posted on the walls in large print on flip-chart paper. Supervisors were encouraged to add to these descriptions as processes were improved, and to leave information for those coming in the next day.

Another significant factor that contributed to the success of the effort was the lack of ego. The collaborative nature of the team and lack of disagreement expedited the effort, creating a more efficient system. People knew their roles and abided by them. The importance of this cannot be overstated.

Let's be honest, recovery of flooded archival material is not a sexy or luxurious operation. The tasks are rather tedious and repetitive, the conditions dirty. There was no working bathroom and no power the first day. Morale gets low at times. There are constantly new people coming in and others leaving, necessitating movement of people to different areas as needed. Staff and volunteers had to be extremely flexible and patient. Everyone involved did an incredible job.

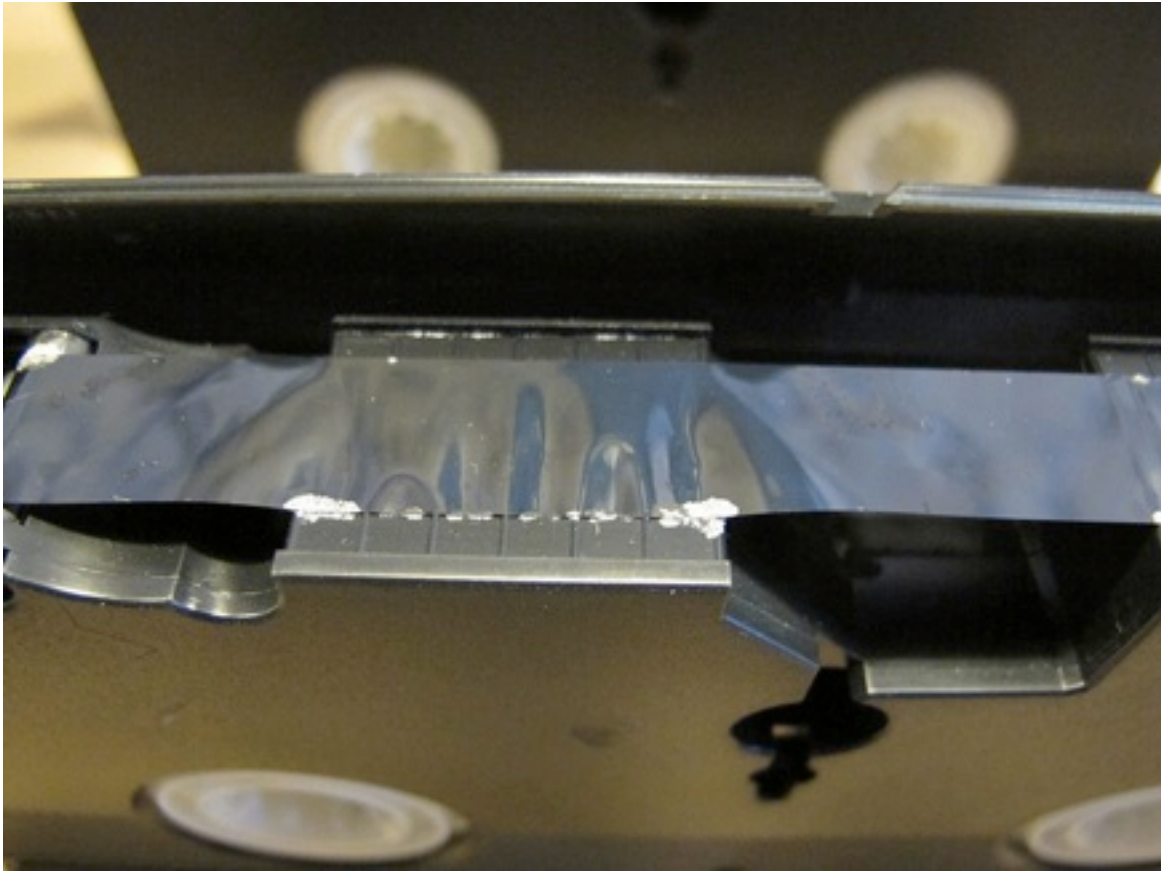
Managing Risks

Lesson 4: It's often the little things that pose the biggest risks

As with any recovery operation of this sort, there are a myriad of risk factors to juggle. Considering our context, a volunteer workforce with limited knowledge of the organization and

often no expertise in the process, it's remarkable that we were able to manage these with minimal negative impact. The procedures, roles, and protocols described above greatly helped mitigate risk of damage or loss. Still, a few issues were constantly on our minds:

- **Dissociation between media and label info:** As mentioned above, one of the biggest risks arose when a tape and its container or label were separated from one another. This often happened in a matter of seconds, as items were separated and moved down the cleaning assembly line. I will admit, a small handful of items were unfortunately separated from their containers/labels, and could not be reunited later. We are now unable to identify the content of a few of those tapes because the media items themselves were not labeled. With media collections, this is perhaps an even greater risk than the flood itself. Employing a documentation person to keep a hawk-like eye over the cleaning process was essential to avoiding constant dissociation.
- **Lack of knowledge transfer:** Inevitably, the operation shuts down for the day and volunteers go home. The next day, there is a good chance that an entirely new workforce will appear. If there is only one coordinator and no one is there who helped the day before, training and overseeing an entirely new group of people takes up a lot of time, poses a fresh set of risks, and greatly reduces productivity.
- **Lack of supervision:** It almost goes without saying that when there is no supervision, supplies get lost, tapes are cleaned using incorrect methods, labels and media items are dissociated, and identifiers are repeated. For example, as mentioned previously, we accidentally named two tables with a letter B prefix when there was no documentation supervisor. As a result, we ended up with multiple items given identifiers B1, B2, etc.
- **Not enough people:** Of course fewer people means less work gets done in the same amount of time. But it also means that one person must do multiple tasks. Unable to concentrate on a specific task, the volunteer may miss a critical step or overlook something. Most mistakes were made when there were fewer volunteers, especially in the absence of dedicated documentation crew.
- **Loss of morale:** Tasks are repetitive; people get tired. With so much work to do, it is important to make sure that people take breaks, are fed and have water so they stay comfortable, and hopefully stay motivated. Free pizza on the second and third day of cleaning likely contributed in large part to our success.
- **Passage of time:** By day 3, media left out to dry—exposed tape media, optical disks without cases—were getting dusty. For cassette formats where it was difficult to get q-tips between the tape and parts of the housing, contaminant deposits began to form around the tape edges (see photo), which needed to be brushed off.
- **Safety and security:** Having a safe and secure room is crucial. Inevitably, a lot of activity occurs after a disaster, and many people are coming and going. Some level of security is essential to ensure things don't go missing, accidentally or intentionally.
- **Lack of supplies:** For the first day and a half we had precious little distilled water, certainly not enough to complete the task. Fortunately, on the second day, Chris Lacinak drove in 24 gallons from Brooklyn, where the lights were on and the shops were open.



Contamination forming on a dried tape. Most VHS tapes had q-tips placed between the tape and the plastic surface to prevent the tape from sticking and adhering to it while drying. By accident, a q-tip was not placed under this tape. As a result the tape stuck, and deposits formed around the edges.

Without his help, we would have struggled to complete the cleaning. We were also constantly running out of gloves and masks, essential items for working with this kind of contamination. Without these items, the cleaning process could not have continued, or at least would have operated at a slower pace until someone could make the trek to the store.

- **Avoiding mold growth:** Maintaining a cool, dry temperature is of utmost importance, as is ventilation. In November in New York City, high heat and humidity from the outdoors aren't enormous risks, but heaters are. The lack of ventilation combined with the restoration of the building's heating system and wet tapes could easily create a fertile breeding ground for mold, which could potentially cause irreparable damage to tapes and create health and safety hazards for volunteers. To mitigate this risk, we kept the storage room at a low temperature (approximately 57°F) and used a dehumidifier to keep the humidity low.

Preparedness Takeaways

Lesson 5: Standard archival practice = disaster preparedness

When working to recover valuable collections from a disaster such as the one Eyebeam experienced, the trained conservator or archivist can't help but think about some of the essential principles of the profession, and how these could be applied in the future or to help other organizations. At times obvious things come to mind, such as how to improve storage in the event of a similar disaster. Other times, one is struck by the importance of certain, often-neglected practices, and why they should be exercised with regularity. The following areas stood out to us in reflecting on this scenario and others like it.

Storage

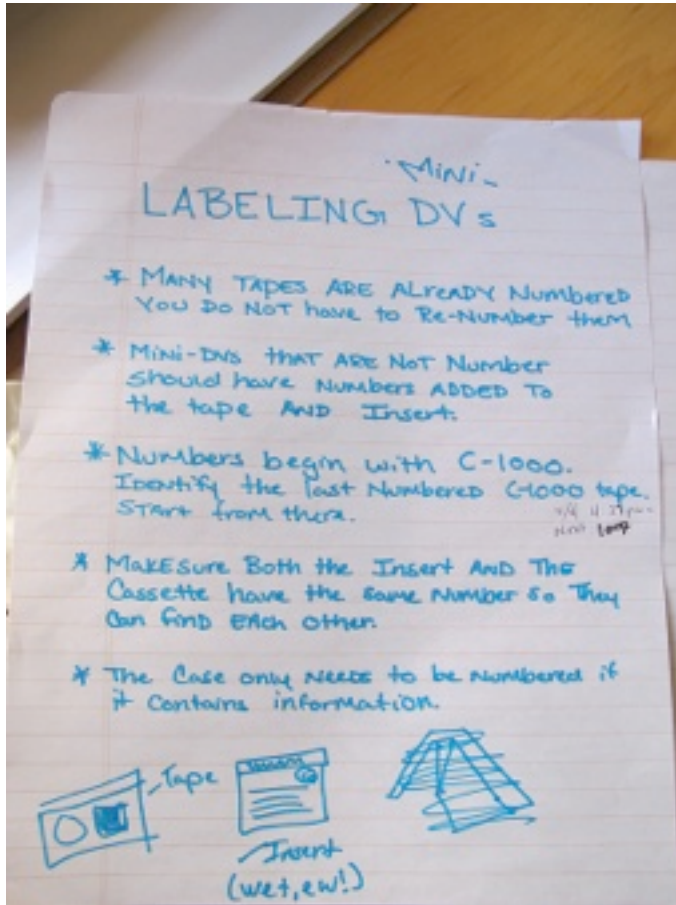
When storing physical media, such as video and audiotape, following a few basic storage principles goes a long way. Media should not be stored in basements, directly under a roof, or near windows. It should be kept away from direct sunlight. It should not be positioned directly below leak-prone areas, such as a bathroom or kitchen. Temperature and humidity should be cool and dry, or at minimum, controlled so there is a lack of fluctuation.

Most important, understand the building and geographic surroundings. If you are near a body of water, as Eyebeam is, don't store valuable collections on the ground floor and especially not in basements. If you are in a hurricane or typhoon-prone area, ensure that your roof is sound. Eyebeam's collections stored on the second floor were spared flood damage. In the future, their media collections will likely be stored upstairs, so if an emergency of the same type occurs, perhaps the media will not be affected (more important, the media content will soon be migrated to a file-based environment, where backups can be made and stored in a geographically separate location).

Intellectual Control

Intellectual control of an archive is a goal that collecting institutions strive for but often struggle with. Creating inventories, catalogs, and/or databases of holdings is labor-intensive work, especially with a large backlog of material to deal with, or when there is little staff time to devote to ongoing production output. As a result, it is not uncommon for an organization to have an unclear picture of its holdings. Not knowing the contents of 15 years of tapes in the closet may feel like little more than a nuisance on a day-to-day basis, but becomes a nightmare in a disaster scenario.

Maintaining an item-level inventory of a collection is helpful for a variety of day-to-day operations, but it becomes a critical identification and prioritization tool in a disaster scenario, and is potentially useful for insurance purposes. Without the ability to prioritize you are not able to effectively allocate limited resources to the most important things in the limited amount of time in which you have to act. You may be working with something of no value at the expense of your most important item. Physical organization to designate groups of media is not enough, as disorganization ensues in disasters and this designation is lost.



Instructions for labeling mini DV tapes during recovery

Eyebeam did not have an inventory of its archival holdings leading up to Sandy. As mentioned above, over 1,300 of those items were damaged in the flood. An accessible inventory (being mindful of the circumstances, which included a lack of power and internet during the first few days) with indication of priority items would have been invaluable. When you have this many items to be cleaned, time is of the essence, and you obviously can't clean everything at once. Knowing which items were most valuable to Eyebeam would have allowed us to prioritize which items required immediate attention. (Note: Eyebeam's collection is relatively small. Many organizations have collections that are 5 to 100 times or more its size and don't have intellectual control. Working in a collection this size without intellectual control is a dire situation.)

Most of the time, electronic, networked access to databases and inventories is highly desirable. However, in preparing for disaster, it is important to remember power is often out, and there is no

internet access. A printed, laminated inventory is essential in these circumstances. It is also important to realize that, even if you know what your priority items are, disaster areas are often dark, first responders may be volunteers or others who are not familiar with collections, and inventories might not always be accessible.

Deaccessioning

Disasters drive home the fact that deaccessioning is a good thing. Without an inventory or access to people with institutional knowledge, our volunteer-led recovery team was unable to make any prioritization decisions. Even when confronted with 10 copies of what appeared to be a commercial DVD, we had no choice but to treat each one as if it were unique. Our thought process had to be, "Perhaps this DVD was produced by Eyebeam, perhaps it was the most important thing they ever created, perhaps these are the last 10 copies in existence, and only one of them will survive this flood. Just in case, we need to clean each one and its packaging." Volunteers cannot judge whether this is the case, or if these items are not worth the time, can be easily purchased and thrown away.

Getting rid of items can be a challenge. Spending time after a disaster, cleaning things that don't need to be, is an even a bigger one.

Labeling

Imagine a pipe bursts, and the pressure of the water blows through the wall and hits your shelf of videotapes. The tapes go flying across the room. The force of the water opens up cases, and many tapes and their containers are separated. The containers are labeled; the tapes are not. How will you choose which tapes to send to a costly restoration vendor if you don't know their contents?

For media like video, audio, and data tape, which have multiple parts, labeling all components is important, especially when items are separated from their container labels. Dissociation of media and their labels could be inadvertent, as in the scenario above, or completely intentional, as when things have been laid out to dry. Though we established an identifier system for separate media components, items that were previously labeled with identifiers on the tape, case, and insert were valuable. They saved time because we didn't have to label them ourselves, and knew we could match them up again later.

Outcomes, Next Steps, and the Need for Digital Preservation

Lesson 6: There is still work to do, and an archive to build

Inventory

After three days, more than 1,300 media items had been cleaned and stabilized with the help of some 40 people. During the subsequent two weeks, those items plus another 600 that were not submerged in floodwaters were inventoried by another dedicated group of volunteers, led by Jonathan and museum professional Melanie O'Donnell (also a volunteer in the recover effort), producing the first comprehensive inventory of the media collection at Eyebeam. As with the cleaning process, this volunteer-led inventory needed careful oversight to avoid errors, duplication, and inconsistent or subjective entry. To enable multiple catalogers to work simultaneously, the inventory was created in a Google Spreadsheet. Data entry guidelines and controlled vocabularies were established to ensure that the cataloging would result in useful and uniform entries. Another advantage to this process was that Chris and I could monitor the cataloging remotely in real time, and hold live "chats" with the catalogers if we saw any issues.

The inventory process was slow, taking two weeks to complete. To knock out the last several hundred items, an all-day cataloging event was organized for Saturday, November 17. After the last item was inventoried, we joined the volunteers who had been helping to clean and salvage the equipment for a celebration.

The inventory is a critical tool for moving forward. It serves two primary purposes: to help prioritize content for the next phase of the project, which is to migrate the content of the flooded media items to stable, file-based storage, as well as to help establish a managed archive.

In situations like this, prioritization plays an enormous role in the overall long-term recovery effort. While much of the content can likely be saved and transferred, it will require costly specialized restoration. Furthermore, in a collection of approximately 2,000 items, not everything can be migrated at once. Items requiring immediate action will have to go first, and hopefully

those can be saved. This time around, unlike the initial cleaning and stabilization phase, it is essential that the most important items be treated first so scarce resources can be properly allocated. Staff can utilize the inventory to identify which artists' works were damaged, and contact them to find out whether they may have a better copy in their personal collections. Those items identified as unique will then be prioritized for restoration and migration. Only when the migration of the media is complete will we know how much we actually saved.

The inventory also can be used to help with estimating costs and with grant writing. By using the content in the inventory, estimations can be created for migration costs and storage requirements. Funds are currently being raised to support the restoration of the damaged material.

The inventory also enabled Jonathan and Eyebeam curatorial fellow Lindsay Howard to organize an exhibition and post-Sandy fundraiser, [Eyebeam Resurfaces: The Future of the Digital Archive](#), on January 10, 2013, featuring works from the collection and interviews with former Eyebeam artists such as Cory Archangel and Mariko Mori. Rather than focus on the negative impact of flood, the event was a celebration of Eyebeam's legacy and its promising future.

Establishing the Archive

There is perhaps a silver lining in this story. As Executive Director, Pat Jones states in Jonathan Minard's documentary, *Recovering Eyebeam's Archive*, "We are coming back, as our neighbors are, and hopefully we'll be stronger and we'll be learning from this experience, and we'll also be putting more emphasis on the importance of our archives and looking to see if we can make better use of them and make them available to a wider public than they have been in the past." The experience has indeed been a wake up call and a driver for Eyebeam to kick their planning for a perpetually postponed digital archive initiative into high gear.

The vulnerability and instability of a single copy of a piece of media becomes readily apparent in a disaster. Unlike paintings, sculptures and textiles, the content contained on the media isn't inextricably bound to its physical state; it's the content, not the carrier that holds value. The good news is that the content can be migrated to the file-based domain, and in that world, disaster preparedness becomes much more attainable. Files can and must be replicated, backed up, and stored in geographically separate locations; if one copy is damaged or destroyed, another copy can replace it.

Long-term preservation of audiovisual, multimedia, and digital content requires more than just good storage, however. To truly be preserved, the content must remain accessible. This means that content needs to be findable in a digital environment, understandable to those who might use it, accessible in a common format, and readable using contemporary technologies. An archive is not simply the collection and storage of data, it is a system of people, policies, and technologies managing content over time to ensure it remains accessible through ever-changing landscapes.

New funding will support the development of a new digital archive initiative at Eyebeam. An archive that will be guided by new institutional policies and practices for the collection of artists'

works and their documentation, technologies to provide the backbone of a stable digital infrastructure, and methods of providing access to artists, researchers, and the public in new and innovative ways. These approaches, along with partnerships with other institutions, will help enable the establishment of a sustainable digital archive.

As Julie Steele writes in the *O'Reilly Radar*, "While no one would say they were glad for Hurricane Sandy, it has clearly forced some important questions about priorities and practices. Eyebeam already has a legacy as a place where advances have been made over the last 15 years. Ensuring that it will be a place where people can access what has been done in digital media during this important period, and into the future, will benefit all of us."¹ By so generously and openly sharing its story, Eyebeam is provoking conversation about the critical need for long-term digital preservation planning, which will hopefully inspire other small arts and heritage organizations and others currently holding ad hoc collections to take the necessary steps to ensure that the content in their care has enduring value. In an age of rapidly advancing technologies and increasingly frequent disasters, there is no time to waste.

¹ Julie Steele, "Eyebeam Update: Two months after Sandy" *O'Reilly Radar*, January 18, 2013. <http://radar.oreilly.com/2013/01/eyebeam-update-two-months-after-sandy.html>

Appendix: Cleaning Procedures

Supplies:

- Flat tub
- Paper towels
- Distilled water
- Absorbent, lint free towel/cloth (microfiber)
- Cleaning solution = 1/3 isopropyl, 2/3 distilled water (mixed daily)
- Gloves
- Mask

Cassette

For all items:

- Remove media from cases (if still inside)
- Remove label from case (if any) (note: this is referring to paper inserts and not adhesive labels)

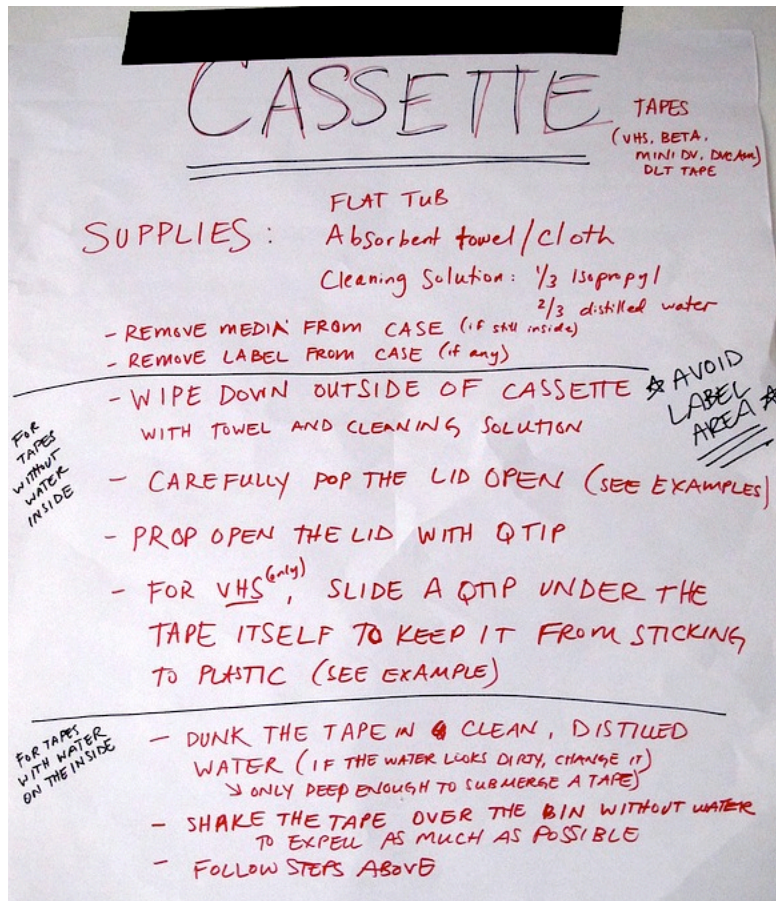
For tapes **without** water on the inside:

- Wipe down the outside of the cassette with a paper towel and cleaning solution, avoiding the label area
- Carefully pop the lid open
- Prop the lid open with a q-tip
- For VHS, slide a q-tip under the tape itself to keep it from adhering to the plastic

For tapes **with** water on the inside:

- Dunk the tape in clean distilled water (Only use enough water to submerge the tape. If the water looks dirty, change it.)
- Shake the tape over a bin without water to expel as much as possible
- Follow the steps above for tapes without water on the inside

Allow all items to dry for at least 48 hours.



Optical Disc

For all items:

- Remove disc from case (if still inside)
- Submerge disc into distilled water
- If there is any residue on the non-label side, spot clean with isopropyl solution and a q-tip
- Wipe the disc with a microfiber towel, always wiping from the inside out, in a “sun ray” fashion
- Put CDs in new, clean cases
- Leave cases open to dry for about 24 hours
- After drying, close case

