



DISASTER RECOVERY FOR TAPES IN FLOODED AREAS

In the aftermath of hurricanes and severe flooding; homeowners, businesses and archives frequently find video and audio tapes that have been exposed to water and debris. Unfortunately, it's all too often assumed that these tapes are ruined and irreplaceable recordings are discarded when they could actually be saved.

For decades, magnetic tape disaster recovery experts have been developing and successfully applying techniques to restore tapes exposed to floods and other disasters to playable condition. No matter how damaged tapes that have been recovered from a flood or hurricane site may look, most wet tapes can now be saved and restored if they are treated properly.

Before deciding to discard your valuable recordings, it's important to understand how water and debris actually affect magnetic tape and what actions should and should not be taken. The following are basic facts about wet tape, handling suggestions to help with recovery and contact information if you need to speak directly with a recovery expert.

You may well find that the tapes you thought were lost can actually be saved.

If your tapes have been in a flood, here are a few things you should know about their condition:

- 1) Short-term exposure to water does not destroy most magnetic tapes.
- 2) Most tapes recovered from floods can be restored if treated promptly.
- 3) Water, alone, cannot damage the magnetic recording on ferric oxide tapes.
- 4) Large to medium size tapes resist damage better than very small tapes.
- 5) Most older, analog tapes resist damage better than newer tapes marked MP or ME.

You should also know:

- 1) Tape cases and shippers are not watertight and do not protect tapes from floods.
- 2) The most damaging exposure involves salt water, sewage or chlorinated tap water.
- 3) Extended exposure to water can eventually destroy magnetic tapes.
- 4) Uneven drying or exposure to heat can cause tapes to deform.
- 5) Incomplete or partial drying can result in damaging fungal growth.

IMPORTANT: Most tapes recovered from flood sites are not destroyed by the flood exposure but by mishandling.

If your tapes have been in a flood and you want to save them, here are some things you can do (and some warnings about things you should not do):

1) **Never attempt to play wet tapes.** Attempts to play wet tapes are almost always unsuccessful, cause irreversible damage to the tape and frequently damage machinery. While experts can restore most wet tapes, the damage done by attempts to play wet or contaminated tapes before they are restored often can not be repaired.

2) **The sooner you do something, the more likely that your tapes can be saved.** Most magnetic tape is highly resistant to short-term exposure to water but extended exposure can do serious damage. Flood recovery is most effective when experts are able to treat tapes shortly after the incident, while the tapes are still wet from their initial exposure.

3) **Flood recovery should be performed by experienced professionals.** Time and budget constraints, however, sometimes require some in-house damage control or recovery attempts. Restoration specialists can usually recover over 95% of flood-damaged tapes but will charge for their expertise. You must determine how valuable your tapes are and what resources you have available to apply to the recovery process.

4) **Contaminants and chemicals in flood water** can often do more immediate damage to tape than the water itself. The most common contaminants in flood water that can damage tape are salt, sewage and chlorine. Should you suspect that these contaminants are present on your wet tapes, they should be rinsed from the tapes as soon as possible. In addition, should sewage or other biological contaminants be suspected, protective gloves must be worn at all times when handling the tapes.

5) **If tapes contaminated with salt, sewage or chlorine** are still wet when they are recovered from the disaster site, and an extended delay is unavoidable before sending them to a recovery specialist, it is best to rinse these contaminants off the tapes and then dry the wet tapes as soon as possible.

6) **If tapes are already dry** when you retrieve them from the flood site, it is best not to rinse or re-wet them. Most contaminants that are already dry do not represent an immediate danger to the tape.

7) **If you attempt to rinse contaminants off tapes yourself, be gentle and use only cool distilled water.** Never rinse tapes with tap water that might contain chlorine.

8) **Professionals will remove tapes from reels and cassettes** to do rinsing and other recovery procedures. Unfortunately, wet tape is very delicate and can easily be damaged during handling by untrained personnel. While not as effective, initial decontamination/rinsing done by inexperienced individuals should be done with the tapes still on their reels or in their cassettes to avoid seriously damaging the tape.

9) **Rinsing can be done by gently pouring distilled water over the tape** or by submerging the tape in distilled water and gently moving the tape from side to side, to dilute or remove contaminants.

10) **In the past, experts have stated that, instead of immediate rinsing and drying, tapes can be held for extended periods in ice water. This can be dangerous.** This procedure can only be done with older ferric oxide tapes such as 2" Quad, 1" helical, 3/4" U-matic, VHS and polyester-base audio tape. This should not be attempted with Metal Particle and Metal Evaporated tapes such as Hi-8, Beta-SP and most modern digital tapes such as Min-DV, DVCAM and DVC-PRO or with acetate-base audio tape. Extended submersion of MP, ME or acetate-base tapes can cause permanent damage.

11) **Most Metal Particle and Metal Evaporated tapes** can be identified by the ME or MP designation stamped or printed on the top of the cassette. Acetate tapes are generally limited to early reel-to-reel audio tapes and can be identified by holding the reel up in front of a light. If diffused light shines through the reel of tape, the tape is acetate.

12) **Another potentially dangerous procedure to use on magnetic tape is freeze-drying.** Freeze-drying is a common disaster recovery process used on paper materials. When applied to magnetic tape, however, it can result in the hardening of contaminants and adhesion of debris/contaminants on the tape surface. This makes later decontamination very difficult. It can also result in damage and snapping of some smaller tapes such as 8mm and various DV formats.

13) **Never leave tapes damp** for extended periods of time. Unlike tapes that are submerged or tapes that are totally dry, damp tapes can develop fungal growth quite rapidly. Fungus will continue to grow on damp tapes and may cause serious damage. Fungus can be removed from tapes by experts but the processing becomes more complex (and costly) and fungus will often cause some damage that is not correctable.

14) **If you are doing initial damage control yourself**, remove all paper inserts and remove tapes from cardboard boxes or sleeves to further reduce the possibility of fungal growth. Labels should, however, remain on tapes to identify content. (This is extremely important as it allows you to later identify which tapes you want restored).

15) **If you cannot get your tapes to an expert for drying**, and you attempt to dry tapes yourself, never use heat. Heat can cause distortion and can accelerate damaging chemical reactions. In-house drying is best done by exposing the tapes to an environment of cool, dry air. When drying tapes, reels and cassettes should be positioned on-edge, not lying flat.

16) **Air movement around the tapes during drying is important** to remove evaporating moisture but do not direct a strong air current directly on the tapes. Too strong an air current can cause tape to vibrate inside cassette shells and cause tape damage. If tapes are dried in-house, it is important to note that, even when all visible moisture is gone, tapes may retain some water in the tape structure itself. Keeping your tapes in a cool, dry area, with good air exchange, will help slow down damage from any residual moisture.

17) **In-house drying attempts** can result in damage. The most common damage is deformation of the tape, tape sticking to itself and/or tape sticking to the inside of a cassette. This possible damage must be weighed against the potential for much greater damage from chemical decay and fungal growth that can occur if the tapes remain wet.

18) **After tapes are dried, they should be cleaned** and checked before they are used. Unfortunately, there is no reasonable way to do this without professional help. If the exposure was very light, some tapes may play back. Most often, however, attempts to use tapes recovered from a flood without proper cleaning and testing is likely to result in damage to both tapes and machinery.

19) **If your circumstances demand that you try to play tapes** without professional treatment, use older machinery you are willing to get serviced or willing to replace after the attempt and be prepared for the likelihood that you will lose or damage some of your tapes in the attempt.

20) **If you need additional information** on handling or restoring flood damaged tapes, you can call Peter Brothers at: (973) 777-5055 or e-mail him at: peter@specsbro.com.

Peter Brothers is the CEO of SPECS BROS., LLC and is an internationally recognized expert who has spent more than twenty five years developing and applying disaster recovery procedures for magnetic tape. He has testified as a tape expert for The Library of Congress, trained museum and archive personnel in tape conservation, restored tapes from nearly every corner of the globe, given disaster recovery presentations to numerous organizations and is a contributing author on a number of National and International Standards on magnetic tape preservation.