

## Flood-damaged documents, books may be salvageable with electron beam technology

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Dr. Suresh D. Pillai shows where food and other materials pass along an automated conveyor belt to be sanitized in moments by a 10 million-electron volt eBeam. Pillai is a Texas A&M AgriLife Research scientist and director of the National Center for Electron Beam Research, College Station. Credit: Texas A&M AgriLife Communications photo

Documents, books and similar items soaked and muddied in the potentially sewage-laden flood waters produced by Hurricane Harvey may be salvageable with the use of electronic beam technology.

"This technology has been used around the world to save documents and paintings that otherwise would be lost," said Dr. Suresh Pillai, director of the National Center for Electron Beam Research, part of Texas A&M AgriLife Research, College Station.

Pillai said the technology is useful for killing mold, fungus and bacteria that invade moist environments. Irradiation has been used worldwide to save documents such as ancient Orthodox Christian icons in Romania, cultural artifacts in Brazil and religious sculptures in France.

The same technology could be used on items damaged by Hurricane Harvey flood waters, such as passports, birth, marriage or death certificates, and books, Pillai said.

"In the case where a library has been destroyed, all of the books – especially those that are out of print or rare – may not have to be thrown away," he said.

He said the method has been shown by other researchers around the world that it does not harm the document if the appropriate dose is delivered.

"The technology uses electrons from commercial electricity, which are accelerated to break the DNA of the fungal spores and bacterial cells. That destroys the pathogen but not the material," Pillai explained.

The [electron beam](#) center normally works with foods to keep them safe for human and animal consumption. The technology also can be used to treat [water](#) to remove pathogens and other organic pollutants. But the

center has worked on documents in the past.

"An army base in Texas had some maps that were water damaged, and so we worked to help save them," Pillai recalled.

The key is an [optimal dose](#) to destroy the possible pathogens from sewage-contaminated [flood waters](#) but not the material, he said, but there is no single "recipe" to use for all documents.

That's where the research part of the center is vital. Pillai said each project is evaluated to determine the optimal dose to irradiate a particular document. The determination may include the thickness of the item and whether it is colored, for example.

A plan would be made for each item to determine the appropriate treatment. The cost for the service has not been determined yet and could vary on the project, Pillai said.

Pillai said waterlogged items could harbor sewage-related pathogens and therefore people should not attempt to clean items first. Rather, let the item dry out before considering electron beam decontamination and preservation.

**More information:** Those interested in finding out whether the center can assist with document preservation should contact Pillai at 979-458-3229 or [s-pillai@tamu.edu](mailto:s-pillai@tamu.edu)

Provided by Texas A&M University

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