

CASE STUDY



BIOLOGICAL HAZARD ABATEMENT: DRYING SAVES 42 BUILDINGS IN CSU FLOOD RECOVERY — FORT COLLINS, COLORADO

BACKGROUND

At the height of a six-hour torrential rain storm, flash flooding through Spring Creek — usually a pleasant little trout stream — became a killer. A twenty-foot wall of water raced through a residential neighborhood trapping and killing five people. Then, it turned its forces on Colorado State University to create the worst disaster in the college's history.

Torrential rains, which dropped ten inches of water in six hours, caused general flooding throughout the campus. Flood levels reached 9 feet deep, flooding basements and first floor levels to a height of 4 feet.

"We had 42 of our 150 buildings water-damaged in the flood," said Ron Baker, Colorado State's director of facilities. When the waters receded, we had a brown muddy mess everywhere. As college officials faced the massive recovery effort, a main concern was the threat to student and staff health from biological hazards.

Munters MCS was at CSU drying for just 22 days. Munters quickly assembled a massive drying system to prevent hazardous biological growth and save building materials. The dehumidifier shown in the picture can remove up to 800 gallons of moisture each day from walls, carpet and structure.

THE PROBLEM

Driving the recovery was the need to open the campus for 23,000 students, returning for the fall semester in just four weeks. Beyond that, the project was complicated by two issues: 1) concerns about health hazards developing from the growth of mold, mildew and bacteria, 2) a wide variation in structure throughout the college.

"In all of the 42 damaged buildings, the potential contamination from micro-biological growth was a concern. Our objective was to have all of the affected facilities achieve a mold count below 500 per cubic meter," said Dr. Douglas Rice, a CSU's microbiologist. "With outside mold counts of about 420 per cubic meter of air in Ft. Collins, we felt that buildings with counts of 500 would be safe to all individuals."

"We had buildings flooded that were built 90 years ago and some just 30 years ago," noted Ron Baker. "The age of the building reflects the construction techniques popular in the period. There are recovery problems unique to each type of construction. In some buildings, new construction was severely damaged requiring that sheetrock be ripped out. In other buildings, older construction, such as plaster and masonry, were saturated with water but still was in stable condition."

THE SOLUTION

One of the early decisions made was to call in a company with a unique expertise in both emergency drying and the prevention of microbiological hazards after flooding.

“After a flood, a wet building is subject to serious problems from mold and other microbiological contamination,” said Dr. Doug Rice. “The right thing to do is to protect the health of the occupants by 1) moving quickly to remove contaminated materials, and 2) using desiccant drying to eliminate moisture that encourages microbial growth. Otherwise, you can end up with serious biological concerns. We called on Munters because it was important to achieve our objective for mold control.” Munters specializes in controlling mold and microbial growth after floods by drying buildings with an advanced method called desiccant dehumidification. Desiccant dehumidification restores the buildings by “pulling” moisture out of wet structural materials using dry air. The process speeds recovery by limiting the need to rip out interiors. This process saves time, and eliminates the need for costly reconstruction.

At the same time, eliminating the moisture removes a necessary life component for mold. Once the water is removed, existing mold spores cannot grow. However, a delay in drying will quickly lead to explosive growth of mold and other microbes, especially inside dark wall cavities.

High humidity after a flood can also cause corrosion of electrical systems, and cause problems in parts of the building that were not flooded. For example, high humidity can be absorbed into paper goods, wallcoverings and fabrics. Computers and peripherals are also very susceptible to damage under these conditions.

“Munters helped us stabilize our situation with temporary humidity control, warding off the effects of high interior humidity,” said Baker. “By doing so, we



Ron Baker, director of facilities at Colorado State University, had to get 42 water-damaged buildings dried and open for the impending return of 23,000 students. “Munters helped check a bad situation that could have gotten rapidly worse,” said Baker.

were able to check a bad situation which could have become worse.”

Once the building was stabilized and the cleaning finished, Munters stayed on to complete the job, using deep drying techniques. Structural drying is essential for many reasons. If moisture is left in the walls, it poses a long-term threat to structural viability. However, short-term problems, like odors from the rampant formation of mold and mildew, can soon cause owners to rip out and replace the walls.

“Masonry block is quite porous,” said Tom McGuire, Munters project manager at CSU. “Many times in a flood, water is absorbed into the blocks where it’s trapped in the interior voids. Munters can dry water trapped deep in the center of these type of walls. But if it is not done properly, the walls will begin to slowly ‘sweat’ in the future. If new sheetrock is placed on top of the walls, and then they sweat, you lose your new construction.

“Stabilizing the buildings, and drying the structure was the lion’s share of the project. In my view, Munters was the only company with the capability to handle a project of this size,” said Boss.



THE BENEFITS

Munters is the world’s largest water damage recovery company. It is uniquely qualified to address water damage problems, including the abatement of dangerous microbiological hazards. Beyond eliminating hazardous microbiological growth, CSU benefited from Munters expertise in many ways:

■ Large Enough to Respond

Munters quickly assembled the manpower and equipment to simultaneously restore 42 buildings! Munters is the only water damage restoration company with enough equipment to service such a large loss. CSU’s recovery coordinator Bill Boss said: “Munters was the only company with the capability to handle a project of this size.”

■ Economic Benefits

CSU had \$110 million of campus buildings at stake. Munters reduced losses by quickly stabilizing the water damage and then reversing much of it. This avoided substantial reconstruction, allowing campus buildings to be in use when students returned.

■ An Experienced Approach

Munters saved sheetrock and stud construction, dried concrete block walls, restored historic plaster and lathe construction built 90 years before the flood. With more than 20,000 water damage recovery jobs successfully completed, Munters has the experience to manage your recovery... no matter what the problems.



After flooding at CSU, 42 buildings were threatened by contamination from mold, mildew and other microbiological organisms. Munters controls mold and microbial growth after floods by drying buildings with an advanced method called desiccant dehumidification. Desiccant dehumidification restores the buildings by “pulling” moisture out of wet structural materials using dry air. This prevents mold and mildew from growing.

MICROBIOLOGIST AT COLORADO STATE UNIVERSITY, SAYS: DESICCANT DRYING PREVENTS ENVIRONMENTAL HAZARDS AFTER FLOODING.

After severe flooding at Colorado State University, tests conducted at the school showed that desiccant drying, a technique used to restore water-damaged buildings, has the added benefit of preventing the growth of toxic mold and bacteria.

The testing conducted by Doug Rice, Ph. D., director of the Colorado State Environmental Health Services Laboratories, showed that 40 flood-damaged buildings — which had been dried by Munters Moisture Control Services — had mold counts lower than the surrounding outside environment.

“Our objective at Colorado State is to have all of the facilities affected by this summer’s flood achieve a mold count below 500 per cubic meter,” said Dr. Rice. “There is no national standard for safe conditions within a building. However, with outside mold counts of about 420 per cubic meter of air here in Ft. Collins, we feel buildings with counts that low will be safe to all individuals.”

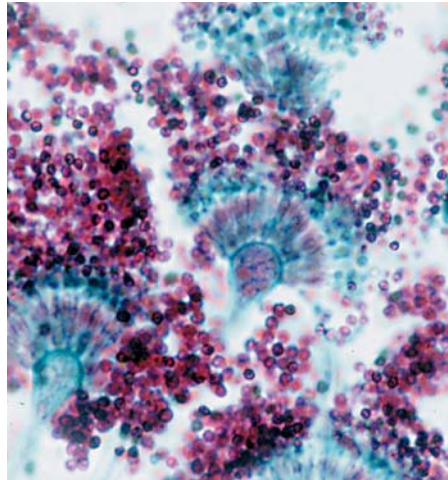
It is Dr. Rice’s job to monitor a variety of environmental conditions at Colorado State University. His lab regularly checks the water used at the school, the food served in the dormitories, the air quality in the buildings, and for the presence of asbestos on campus.

“Without Munters, Colorado State would have had a terrible mold contamination problem,” says Dr. Rice. “This is evident from both measurements made before drying began at CSU, as well as the experience of other water-damaged Universities, that didn’t use desiccant drying after a flood.”

Rice cites a recent flood at North Dakota University as a prime example. “North Dakota waited too long to initiate desiccant drying as part of its recovery plan,” he says. “After a flood in 1997, mold was allowed to grow inside the buildings and the problem became so toxic and intense, that the school had to hire an hazardous material abatement company to solve the problem.”

According to Dr. Rice, the affected building had to be gutted back to steel and concrete and then sprayed with fungicide to resolve the problem. The workers faced such dangerous conditions that they needed respirators and protective suits to work safely.

Douglas Rice, Ph. D. and director of Colorado State Environmental Health Services Laboratories, said that drying after a flood greatly reduces the chance of health problems from bacteria.



Fungi, such as Aspergillus, can quickly cause musty odors, signaling its presence after flooding. Some fungi may lead to allergic reactions, illnesses and even death if left unchecked.

“People associate mold with allergic reactions,” says Dr. Rice. “It’s true that many people are allergic to certain types of mold, but there is more at stake than just a few runny noses. Some molds can make people extremely ill.”

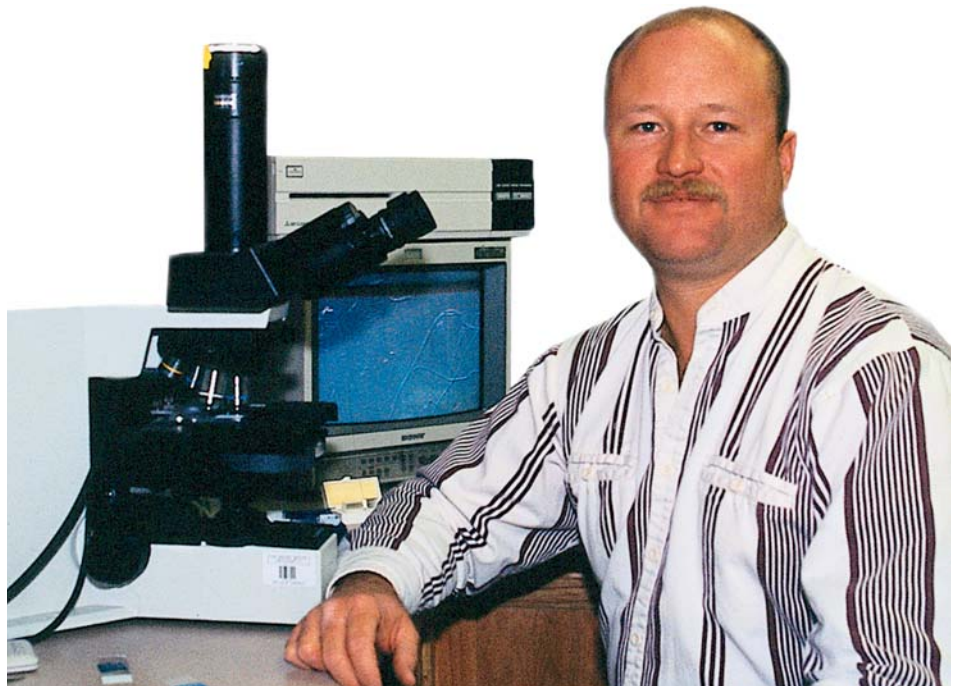
Rice says that some very common mold varieties — such as Stachybotris and Fusarium — are both toxigenic and carcinogenic. Such varieties can cause respiratory problems including black lung disease and various types of cancers.

The problem after flooding is that fungi have the perfect environment to prosper. “Molds need water and food to repro-

duce,” says Dr. Rice. “Since they are found about everywhere and can eat anything — for example, carpet glue or motor oils — the only way to stop them is to remove the presence of water. At Colorado State Munters did a fantastic job of just that.” Dr. Rice credits CSU for acting fast after the flood. “The University had Munters drying within days of the flood. This was very important because mold will begin to show and smell in about ten days, and begin to generate spores one week after that,” said Dr. Rice.

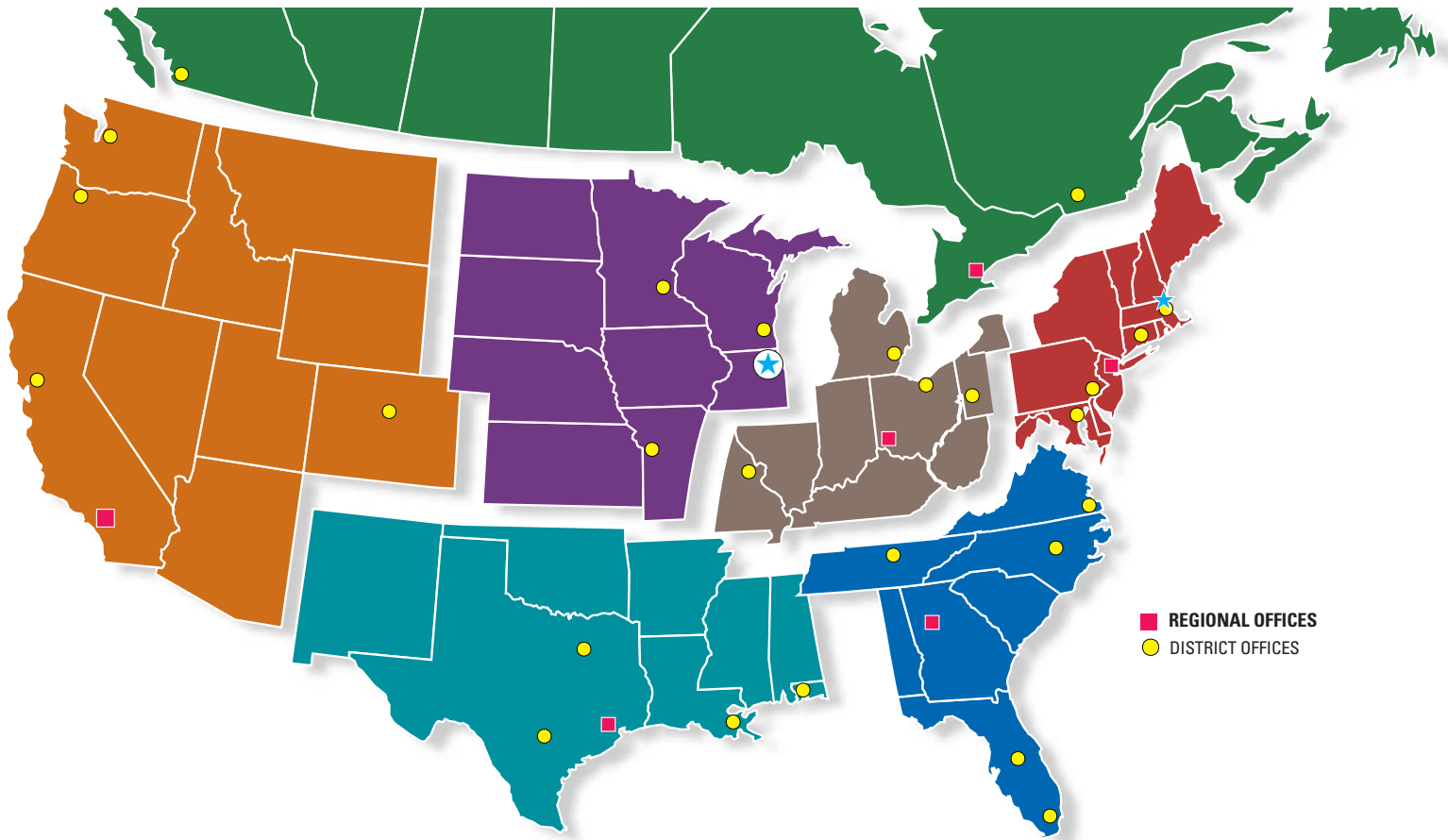
Citing data he has collected since the flood, Dr. Rice makes his point about the importance of drying. “Looking at measurements taken using a spiral air sampler, we see that drying significantly lowered mold counts throughout the flooded campus buildings. For example, in the Engineering Building mold counts were 1600 before drying started, and 250 afterwards. In another wing, pre-drying counts were 1100, and 330 after. We have data like this throughout the campus. It all shows that Munters got us below our objective for mold control, sometimes reducing the mold count by 600%.”

“After a flood, a wet building is subject to serious problems from mold and other microbiological contamination,” said Dr. Rice. “The right thing to do to protect the health of the occupants is to remove contaminated materials, use desiccant drying to eliminate moisture that encourages growth, and to act fast. Otherwise, you can end up with serious biological concerns.”



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