

Assisting with the Dry Material Delivery and Protection System

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- Data are still coming in...
- Gaining insights, but lessons still emerging...

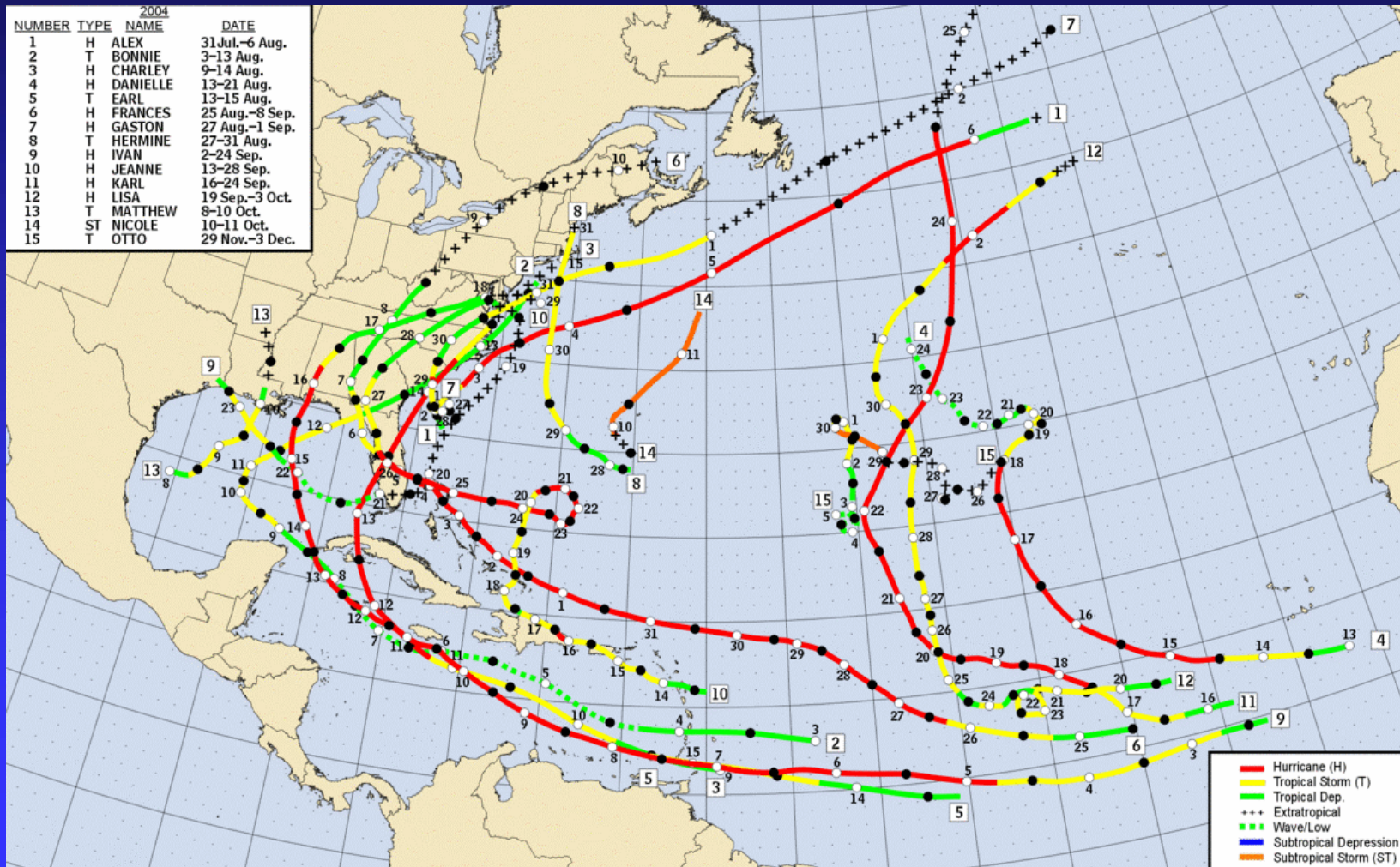
Observations from the Eye of the Storm

A building material manufacturer's
point of view

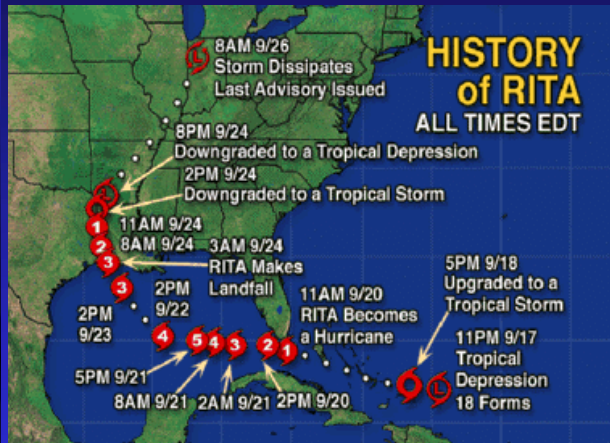
*Knowledge may have its purposes, but guessing
is always more fun than knowing.*

- W. H. Auden

2004 - A busy year for hurricanes



2005 – A Season of Firsts



- 1st with 26 named storms

- 1st with 13 hurricanes

- 1st with four major hurricanes hitting the U.S. (*Dennis, Katrina, Rita and Wilma*)

- 1st with three Category 5 hurricanes



Costliest U.S. Hurricanes

<i>Rank</i>	<i>Hurricane</i>	<i>Year</i>	<i>Category</i>
1	Katrina	2005	5
2	Andrew	1992	5
3	Wilma	2005	5
4	Rita	2005	5
5	Charley	2004	4
6	Ivan	2004	3
7	Frances	2004	2
8	Hugo	1989	4
17	Camille	1969	5

Lessons Learned from Hurricane Recovery

- For dry material delivery, mostly logistical issues
 - Disposal of damaged materials
 - Dry storage & transportation
 - Job stocking, staging & storage
 - Common sense will take you a long way
- 2004 season confirmed it's a big job, but basically no different than past disasters
- 2005 season introduced entirely new dimensions

Nothing new here...

- “Hurricane Katrina: A ‘Perfect Storm’ for Mold Litigation”

Alexander Robertson, IV

Mealey's Litigation Report: Mold Vol. 5, #11

- “If you have found where you were exposed to toxic mold, you will need find the responsible parties (if any) who are capable of paying.”

http://www.toxic-mold-stachybotrys.com/pages/mold_litigation.html

A matter of scale...where to dispose of all the debris?



Disaster debris is piled on the right-of-way for pickup. This photo is building materials supply business. New sheets of gypsum drywall were damaged as a result of the storm.



Photos by T. Townsend,
K. Cochran & M. Semiz,
University of Florida

Impact on Production Facilities

Materials shortages
due to:

- Increased demand
- Interrupted & reduced production capacities
- Disruption of transportation & distribution networks



Consequences of Shortages

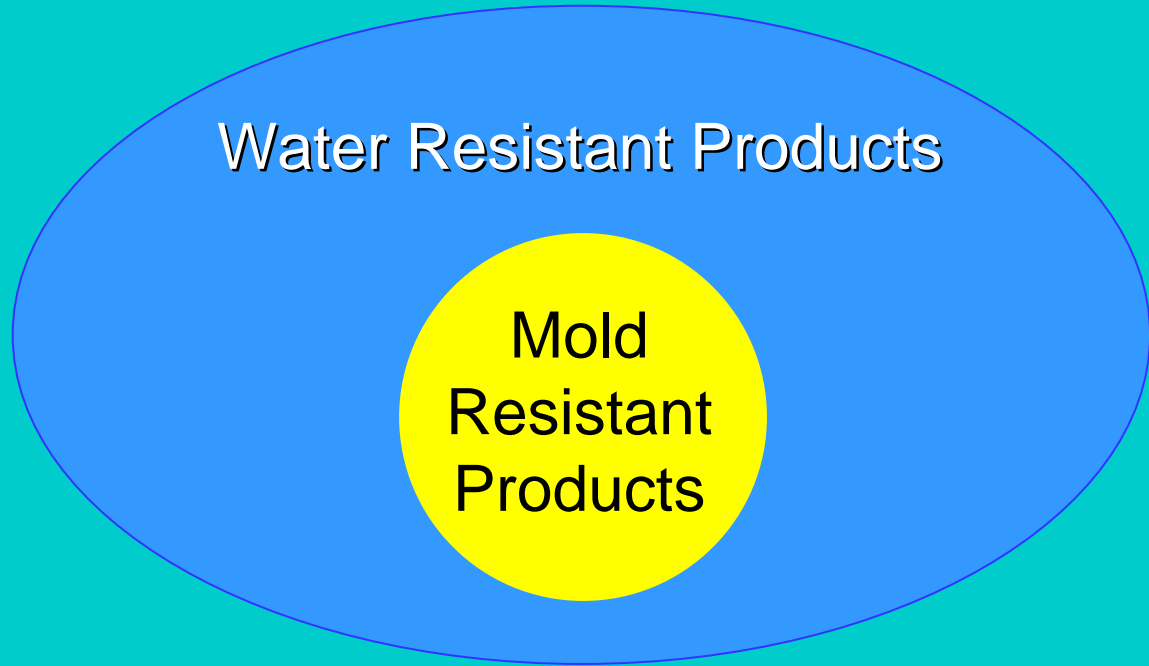
- Cost & schedule impacts
- Inappropriate materials substitutions
 - Check labels & product specifications to be sure they are right for the application
 - Looks can be deceiving for specific fire, acoustical, hygrothermal or antimicrobial properties
- Law of Commodity Products
 - If it's not in the product specifications & the manufacturer doesn't differentiate the product by claiming enhanced properties, the product will not have them!
- Know your supplier!

Moisture Resistance does not mean Mold Resistance!!!

All Building Materials

Water Resistant Products

Mold
Resistant
Products



Mold will grow on anything...

- Given time & the necessary environmental conditions
 - New Orleans plant office
 - Luxuriant mold growth on steel, plastic laminate, vinyl cushions, fabrics, etc.



Do you need to tear out wet drywall?

- Wallboard can be remediated
 - Dry quickly without damage
 - Can be cleaned & sterilized, but the cost of doing this properly often exceeds the cost of replacement.
- Rule of Thumb
 - Requires qualified professional judgment
 - When in doubt tear it out!
- IICRC S520 *Standard and Reference Guide for Professional Mold Remediation*
- IICRC S500 *Standard and Reference Guide for Professional Water Damage Restoration*

What does “dry quickly” mean?

- Rule of Thumb
 - 24 to 48 hours
- Onset of hyphae growth
- May be overly conservative for many cases, but there is insufficient data to support changing this general recommendation

ORNL/Tuskegee Project Objective:



AP Photo

Investigate impact of flood water on performance of traditional and flood-damage-resistant residential envelope systems.

Flood Damage-Resistant Construction

Technology Fact Sheet



Buildings for the 21st Century

Buildings that are more energy efficient, comfortable, and affordable... that's the goal of DOE's Building Technologies Program. To accelerate the development and wide application of energy efficiency measures, the Building Technologies Program:

- Conducts R&D on technologies and concepts for energy efficiency, working closely with the building industry and with manufacturers of materials, equipment, and appliances
- Promotes energy/money saving opportunities to both builders and buyers of residential and commercial buildings
- Works with state and local regulatory groups to improve building codes, appliance standards, and guidelines for efficient energy use

Energy-Efficient, Flood-Damage-Resistant Home Reconstruction

INTRODUCTION

The purpose of this factsheet is provide homeowners and builders with information on materials, systems, and methods which, when used to repair flooded homes, will make them more resistant to future flood damage. Using these flood damage resistant restoration techniques will:

- Reduce vulnerability to future flood damage and disruption,
- Potentially lower home flood insurance rates, and
- Reduce energy costs and increased home comfort.

The focus of this factsheet is on the damage from wetting and drying in flooding where water movement is primarily vertical—no storm surge or rapidly moving water that could damage the building structurally. It is based on flood testing done by Tuskegee University and the Oak Ridge National Laboratory. Because studies have not yet evaluated the impact of chemical or biological contaminants (e.g., fuel oil or sewage), definitive recommendations for envelope materials and systems appropriate for contaminated environments are not available.

The Federal Emergency Management Agency (FEMA) defines flood-damage resistance as the ability of materials, components, and systems to withstand direct and prolonged contact with floodwaters without sustaining degradation that requires more than cosmetic repair to restore them to their original condition. This definition should also include: individual materials that are considered flood-damage-resistant must also not cause degradation of adjacent materials or the systems of which they are a part. Cosmetic repair includes cleaning, sanitizing, and resurfacing (e.g., sanding, repair of joints, and repainting). For a material to be considered flood-damage-resistant, the cost of cosmetic repair should be less than the cost of replacing the affected item.

While new construction is typically excluded from the 100-year floodplain, flooding does occur beyond that floodplain associated with hurricanes or unusual storm events. New construction in areas outside the floodplain



ORNL/TM-2005/34

Field Testing of Energy-Efficient Flood-Damage-Resistant Residential Envelope Systems Summary Report

June 2004 (revised 6/05)



Photo: FEMA

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U.S. Department of Energy
Energy Efficiency and Renewable Energy
Building you a greener future where energy is clean, abundant, reliable, and affordable

Building Technologies Program

Parting Thoughts

- *Moisture Control is the Key to Mold Control*

- U.S. EPA

- Know your source for information & materials
- If you design a levee for a once in 50 years event, don't be surprised if it only lasts about 50 years.