



ISABEL

Lessons Learned

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IMPACTS OF ISABEL

September 18-19, 2003

- Actual flooding close to predicted 100 year flood.
- Technically, approximately 80 year flood.
- Damage from tidal surge; rainfall not significant.
- Flood maps basically correct in tidal floodplains.
- Homes built in compliance not damaged.
- Significant damage from less than 3 foot waves.
- Over 500 homes substantially damaged.



MITIGATION TOOLS

- Flood Insurance Increased Cost of Compliance.
- Increase freeboard from 1 foot to 2-3 feet.
- Map Coastal A Zones.
- Anchor existing tanks.
- Elevate utilities as replaced.



FLOOD INSURANCE

- Most property owners had flood insurance.
- Significant mitigation was accomplished with help of flood insurance and ICC.
- Increased Cost of Compliance (ICC) pays extra \$30,000 to elevate if substantial damage.
- Flood insurance does not pay for replacement.
 - Elevation costs more – at least \$40,000.
 - Pays for losses to level of flooding, not replacement.
 - Still purchase flood insurance if flooding likely.



FREEBOARD

PROTECT PROPERTY FROM FLOOD DAMAGE

- Sea level rise – up to 3 feet next 100 years.
- Land subsidence.
- More frequent storms.
- More severe storms like Isabel.



FREEBOARD

PROTECT RESIDENTS FROM DISRUPTION

- People still out of their homes.
- Recovery takes a long time.
- Recovery more expensive than most think.
- Stress leads to other problems.
- Flood insurance does not pay for all.



FREEBOARD

FLOOD INSURANCE SAVINGS

A SINGLE FAMILY HOME, ONE FLOOR, NO
BASEMENT WITH \$200,000/\$50,000 COVERAGE:

- At BFE (0 feet) = \$902
 - 1 foot above = \$605
 - 2 feet above = \$428
 - 3 feet above = \$388

(Refers to feet above 100-year flood elevation.)



FREEBOARD

**ADDITIONAL COST TO ELEVATE 2-3 FEET ABOVE
BFE CAN BE RECOVERED QUICKLY THROUGH
SAVINGS IN FLOOD INSURANCE PREMIUMS**

- **Estimated cost to lay 2-3 courses of block =
\$1000 - \$1800**
- **Maximum flood insurance savings per year =
\$514**
- **Time to recoup additional expense = about 3
years**
- **Flood insurance will be more costly in future**



COASTAL A ZONES

SUBJECT TO 1-3 FOOT WAVES

- Less than 3 foot waves caused significant damage.
- Decks and tanks torn loose and batter foundation.
- Area not currently mapped.
- Not easy to regulate unless mapped.
- Consider mapping as part of Map Mod.?



COASTAL A ZONES

WAVES 1-3 FEET

- Covered in Coastal Construction Manual.
- Regulated similar to V-zones
- Area below kept essentially open
- Waves pass through without damage
- Elevate or anchor tanks.



ANCHOR TANKS

- Remediation for oil spills over \$2.25 million
- Initiative to anchor residential oil and propane tanks
- Codes require all new and replacement tanks be anchored
- Existing tanks not addressed except by Baltimore County.



ANCHOR TANKS

- Develop effective, inexpensive, permanent solution that can retrofit existing tanks in place
- Uses existing technology – ground anchors
- Certified by engineer to hold tank during flood
- Train oil and propane suppliers how to install by video and workshops
- Educate public to create desire to anchor tanks
- Cheap insurance - \$350 to protect \$2,000 tank and contents over 20 years = \$17.50/yr.



ANCHOR TANKS

