The Future of Property Insurance Risk: An IBHS Perspective
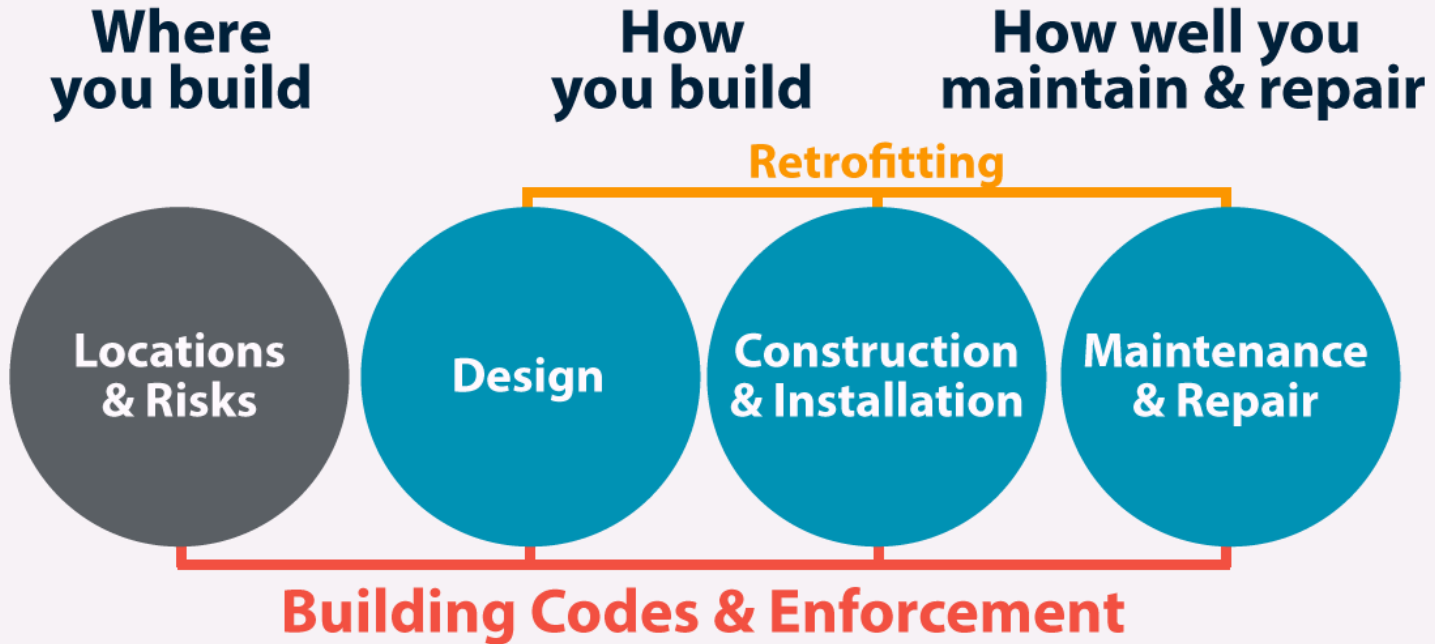
November 2015

IBHS Mission:

"To conduct objective, scientific research to identify and promote effective actions that strengthen homes, businesses, and communities against natural disasters and other causes of loss."

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What Does the Public Think About Property Risk?

- It won't happen to me. If it does, someone else will pay for it.

- I would rather invest in granite countertops than a strong roof.

- A 1/100 year event means nothing bad will happen for 99 more years.

- Insurance costs too much.

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Factors Affecting Property Risk

- Population Effects

- Weather and Climate

- Design and Construction

- Maintenance

- Global and Political Issues

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Population Effects

- Increasing population density and property values in coastal and wildfire zones.

- Mobile population causes unfamiliarity with new location's natural hazards.

- Aging population and financial challenges affect maintenance, vulnerability, evacuation.

- Government risk subsidies (insurance and post-disaster) also encourage building in risky areas.

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Weather Trends

- Extreme precipitation: 9 of top 10 annual rain totals = since 1990; frequency/intensity of heavy rain expected to increase.

- No significant hurricane landfalls since 2005.

- Sea level rise contributes to stronger hurricane storm surge.

- Pervasive, long-term drought in West exacerbates wildfires.

- Environment supports more prevalent tornados and hail; impossible to separate weather changes from improved data reporting.

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Climate

- Climate is changing – with uncertain, complex effect on hurricanes, convective storms, wildfire, winter weather.

- Short-term losses driven more by populations trends than climate.

- Long-term changes will not be known for many years.

- "No regrets" strategies focusing on adaptation are beneficial today and in the future.

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Design and Construction (Urban)

- Impervious surfaces → more runoff/flooding following hurricanes or extreme precipitation.

- Urban heat islands create stress on human health and the power grid.

- Aging infrastructure and utilities contribute to losses and undermine disaster response and recovery.

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Design and Construction (Structures)

- Aging residential and commercial buildings and components cause higher claim frequency/severity.

- Buildings exist in communities where the weakest link can cause wider damage.

- Retrofitting is complex concept that is harder to assess than new construction.

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Design and Construction ("Green")

- Sustainability has captured public attention; must be consistent with disaster resistance.

  - Wind and fire risk may increase from solar panels, green roofs, and certain insulation products—all must be installed in a hazard-appropriate way.

  - After 9/11, Lower Manhattan buildings designed to reduce environmental impacts did not respond well to the impacts of the environment (e.g., Hurricane Sandy).

- Push synergy through "Going Green and Building Strong" to promote overall resiliency .

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Design and Construction (Tech)

- "Smart Homes" can identify and help prevent problems, but create new risks if they fail or are hacked.

- New building materials may be cheaper or better for some applications, but can pose risks.

- Panelized/Modular construction reduces site-specific errors, but raises possibility of repeated failures.

- Building codes and standards must better recognize both good and bad new technologies.

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Design and Construction (Fire)

- Large, open floor plans allow interior fire to move more quickly from room to room.

- Synthetic upholstery exacerbates flashover.

- Fire propagates faster due to engineered I-joint floor systems, modern windows and doors, and other lightweight, synthetic construction materials.
  - According to UL and NIST, overall effect is 8X faster flashover times, posing risks to occupants, firefighters, and property.

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Maintenance Issues

- Aging of roofs and other building components increases claim frequency and severity – research will add clarity.

- Maintenance lapses are implicated in wide range of preventable interior fire and water losses.

- Exterior maintenance issues include intrusive trees, dry vegetation, clogged and damaged gutters, etc.

- Attitudinal issues have large impact ("no time," "no money," "no ability," and "no personal responsibility").

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Global Issues

- Cascading failures (Sandy, Fukushima, wildfire/mud slides) greatly increase scope and scale of losses.

- Supply chain fragility transforms remote events into immediate operational problems.

- Cost of capital in a global economy influences overall health of property insurance system.

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Political Issues

- Political gridlock (especially in Congress) prevents even consensus legislation from advancing.

- Budget rules and short-term outlooks prevent spending $ today to save $$$$ in the future and value post-disaster aid over pre-disaster mitigation.

- Pre- and post-disaster aid processes are inefficient.

- It is politically easier to suppress insurance rates than reduce property risk.

- Home builders and realtors are more directly politically engaged than insurers and mitigation allies.

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Solving the Property Puzzle(s)

- Accelerate and expand research that provides clarity into vulnerabilities.

- Create actionable solutions (including new technologies) for both new and existing buildings.

- Properly align public and market (dis)incentives to encourage action "while the sun shines."

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Mitigation Research Affecting Property Risk

- Lower loss exceedance curve

- Accurately assess weather/built environment interaction

- Better understand design, construction, and materials vulnerabilities

- Monitor effects of aging and repair versus replace results

- Promote "Going Green and Building Strong"

- Evaluate benefits and risks of new technologies and innovations

WIND

WILDFIRE

HAIL

RAIN

Improving Product Performance
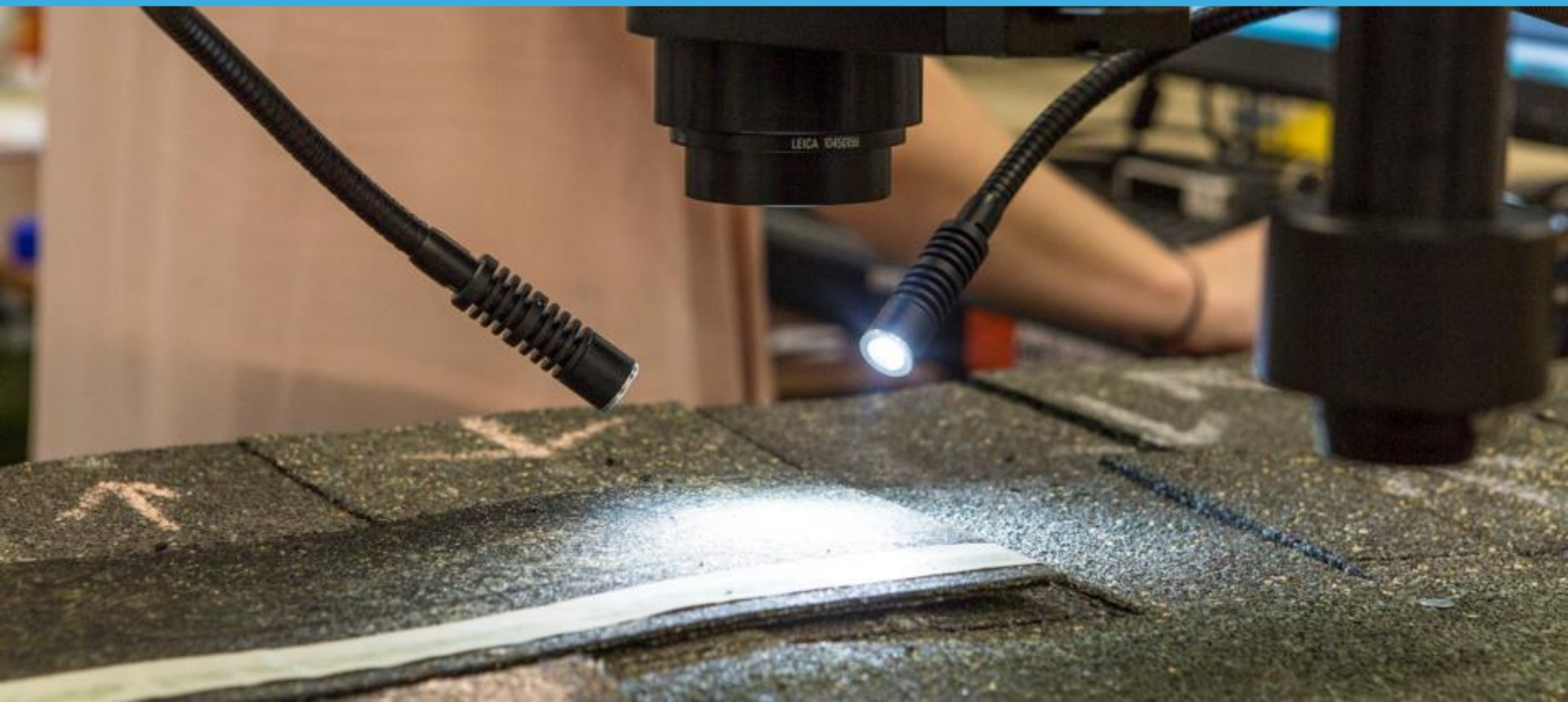
Understanding Vulnerability

Effects of Aging

Going Green and Building Strong

Moving forward...

- Leaders can galvanize public attitudes toward property risk

- Clear, consistent messages needed for public education

- We must understand benefits/risks of new technologies

- Relationship between natural & built environment influences risk

- Focus on "no regrets" strategies for mitigation and insurance

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Thank You.

Please visit DisasterSafety.org

Fostering Long-term Loss Prevention

Robert Meyer

Department of Marketing

Co-Director, Wharton Center for Risk Management and Decision Processes

The Wharton School

University of Pennsylvania

Two perennial questions:

- Why do individuals and organizations persistently undervalue protective measures?

- Are there best-practice communication strategies that can help improve these valuations?

How could a veteran cruise ship captain allow this to happen?

How could 60% of people owning beachfront homes in Texas not have Flood Insurance when Hurricane Ike struck?

Why did 250,000 car owners not move their vehicles to higher ground in advance of Hurricane Sandy?

Today....a few answers at two time scales

- **Short-term hazards---preventive actions in the face of extreme weather events**

- **Long-term hazards—adaptation to climate change**

Why do people under-prepare? Two Standard explanations that turn out to be wrong

- Lack of awareness/underestimation of objective hazard probabilities
  - Fact: people typically *overestimate* incidence (but *underestimate* personal impact)
- Intuitive thinking biases; e.g., acting rashly without thinking about cost-benefit tradeoffs
  - Fact: Failures to prepare are often deeply thought-out, well-reasoned mistakes

Example: Hurricane Sandy

Sandy Surveys: conducted every 3 hours until landfall
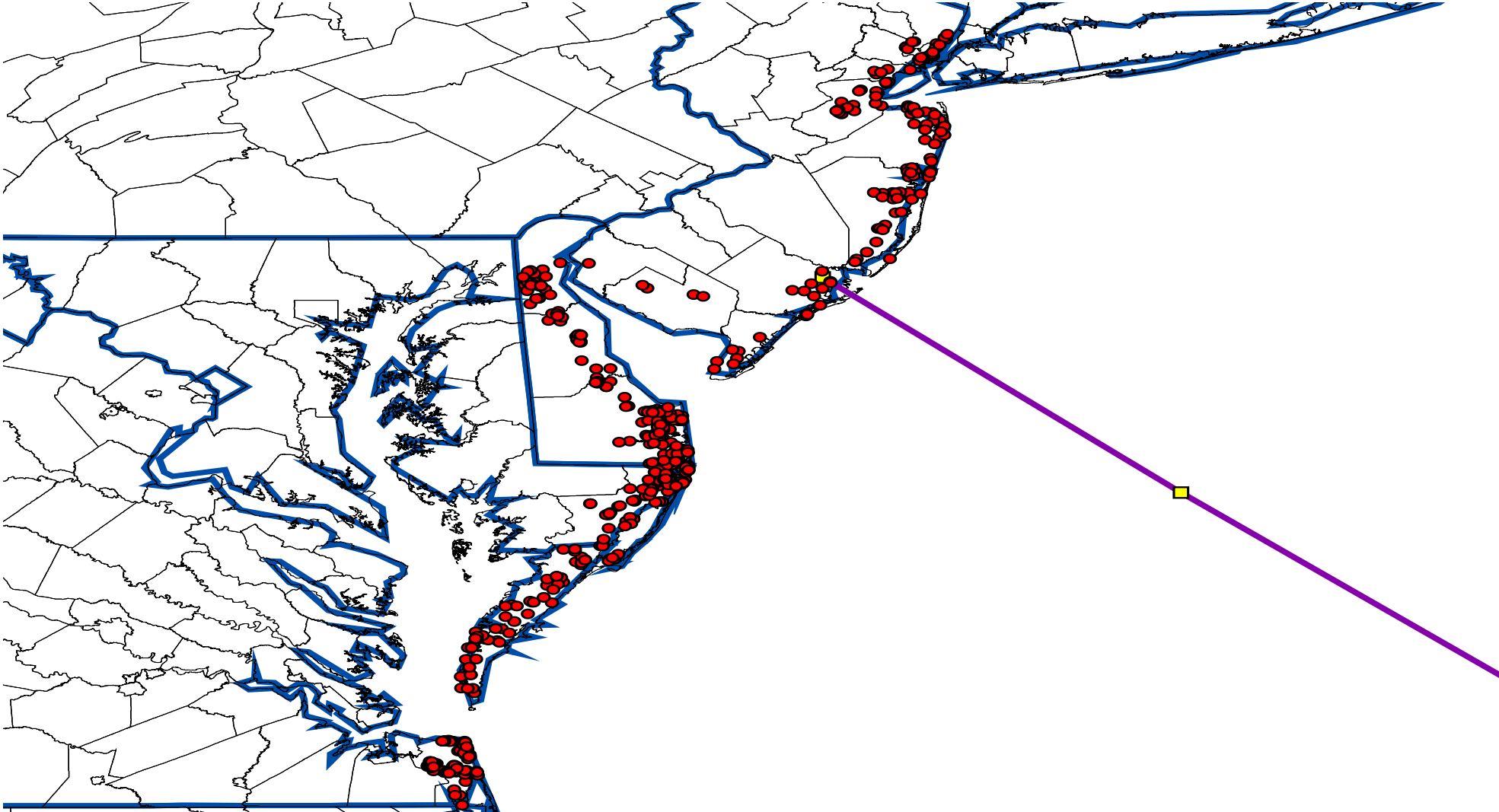
Findings

- Few doubted a disaster was about to happen: in fact, there was gross *over*-estimation of the probability of experiencing hurricane-force winds

Objectively, hurricane winds were never that likely
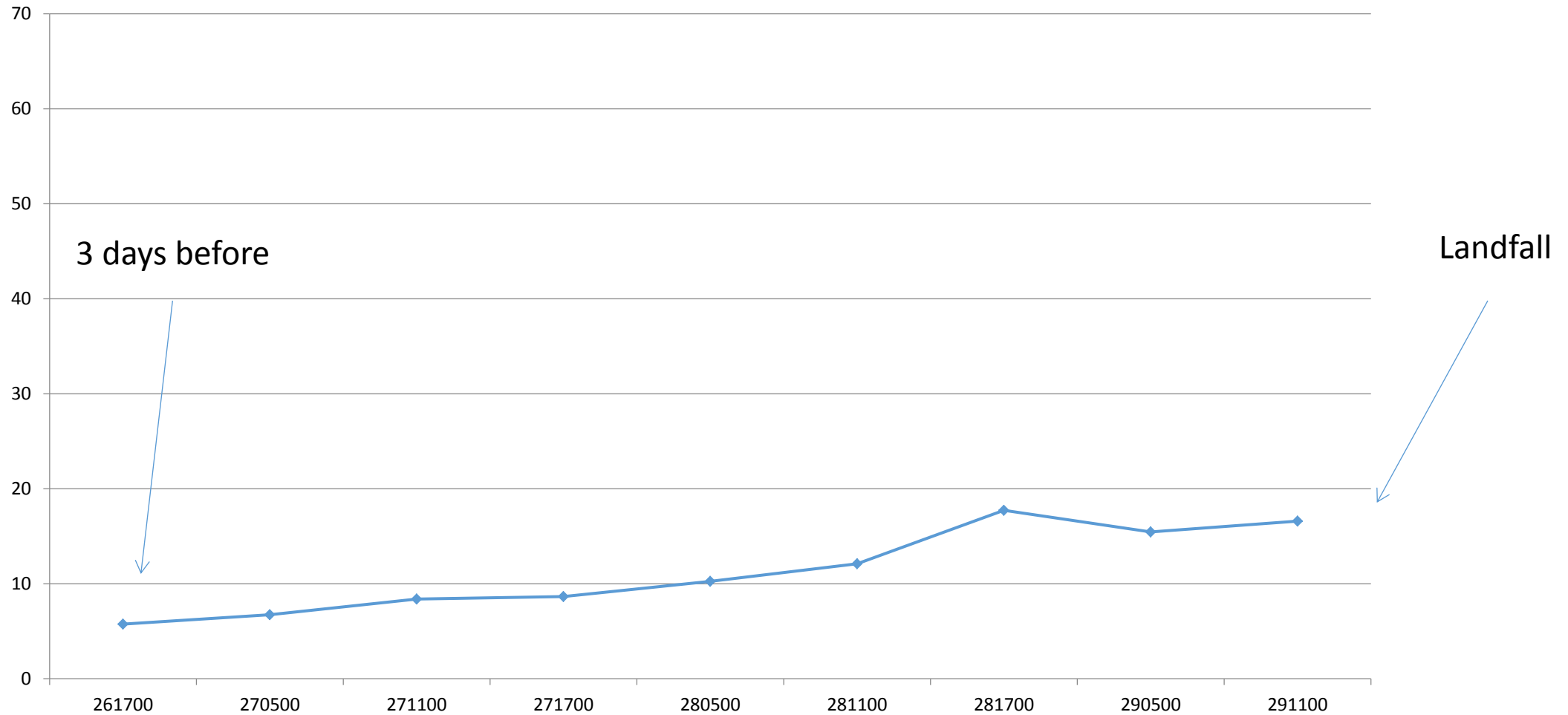
…But people thought they were
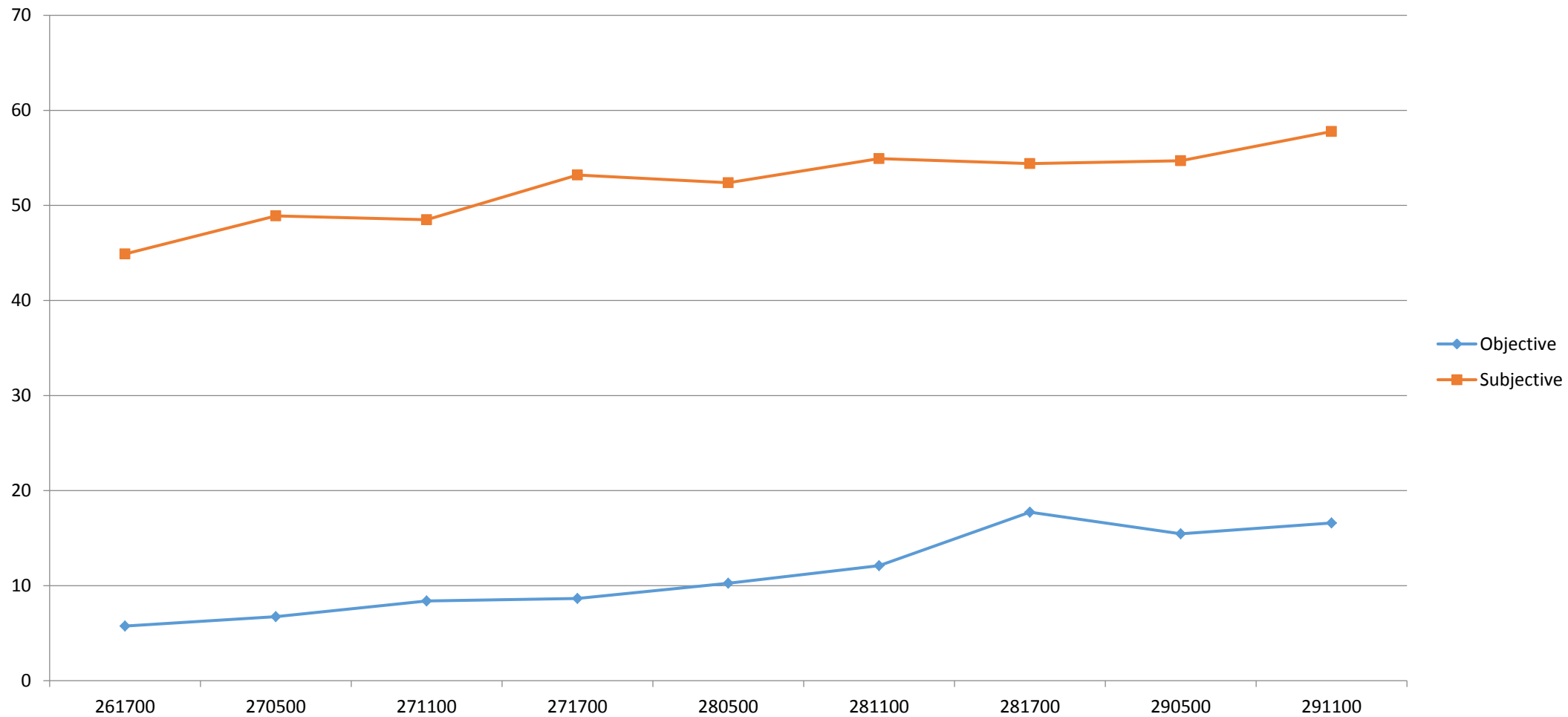
…yet few were particularly worried about it

Sandy
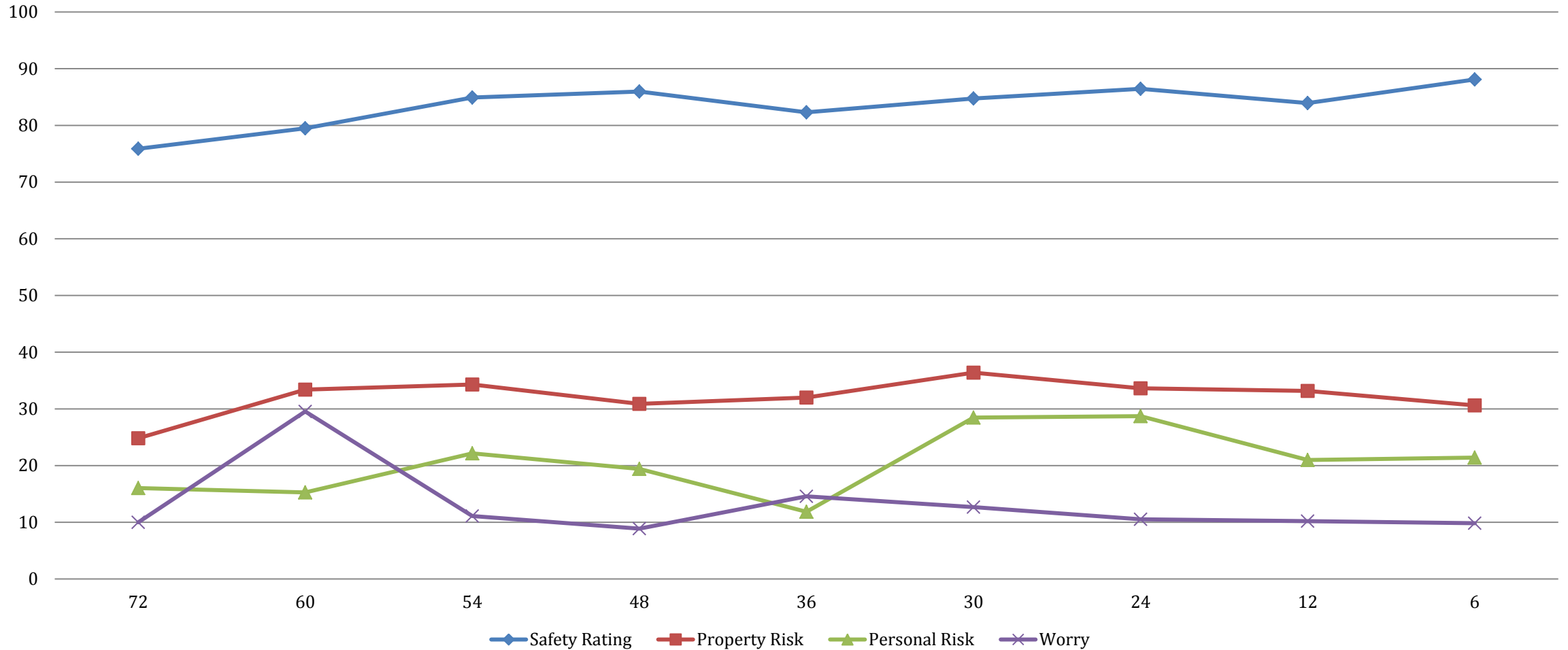
What people did: lots of light-weight preparation
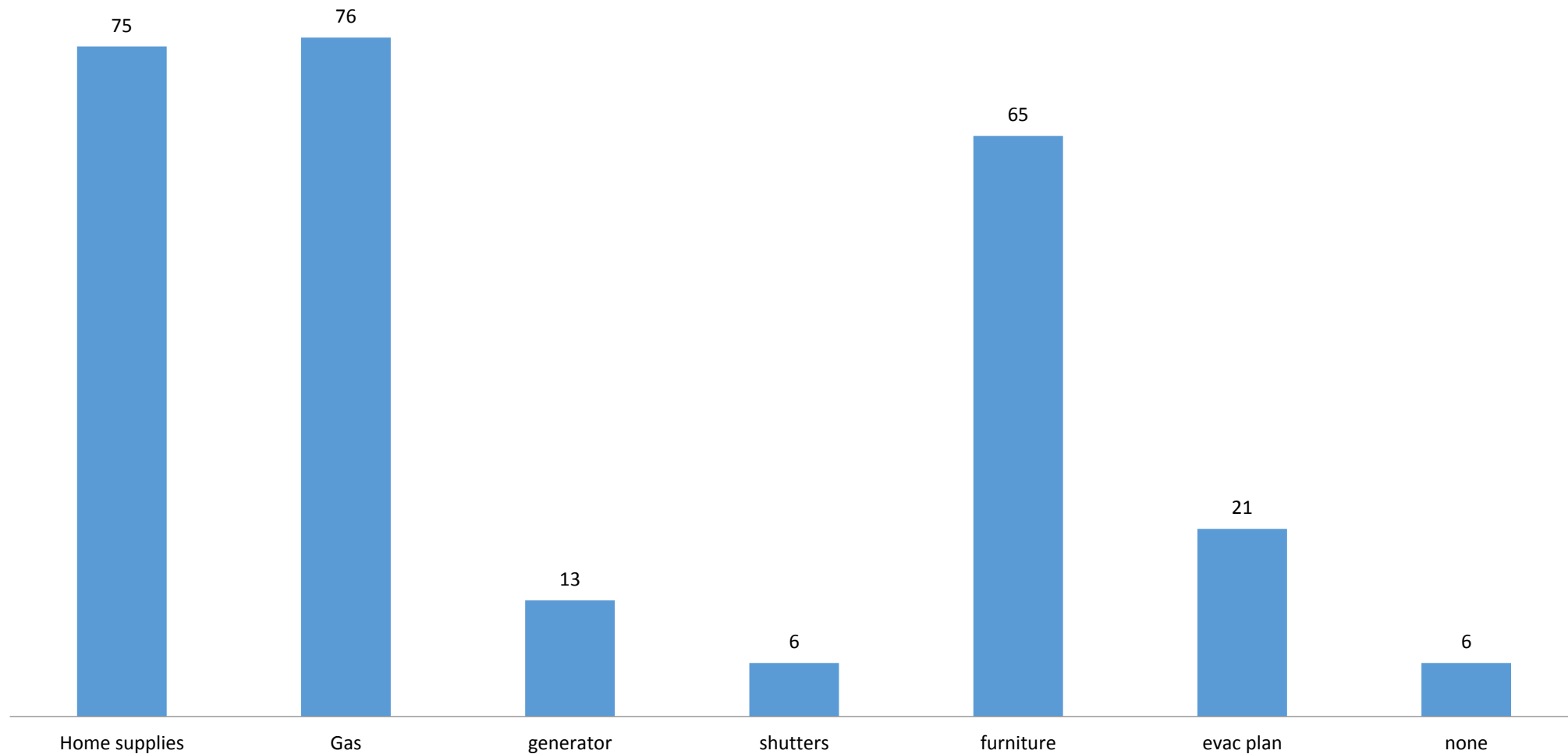
Why the under-preparation?

At the core: poor mental models of the threat

What experiences do people in the NE have that can be used as analogies?

- Wind storms (thunderstorms)
- Snow storms
- (For some) Hurricane Irene in 2011
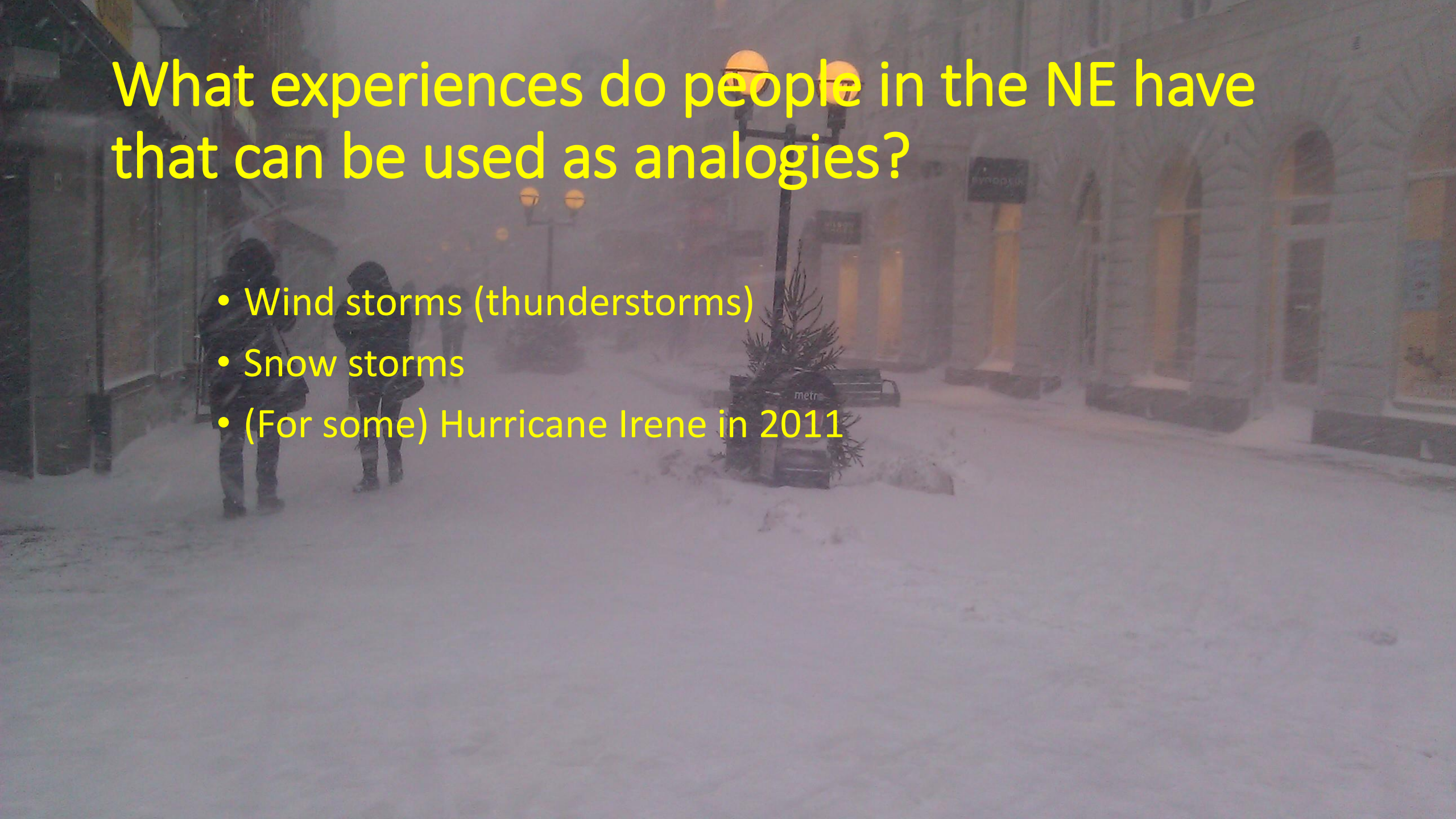
Perceived Greatest Storm Threat by Distance to Water--Sandy
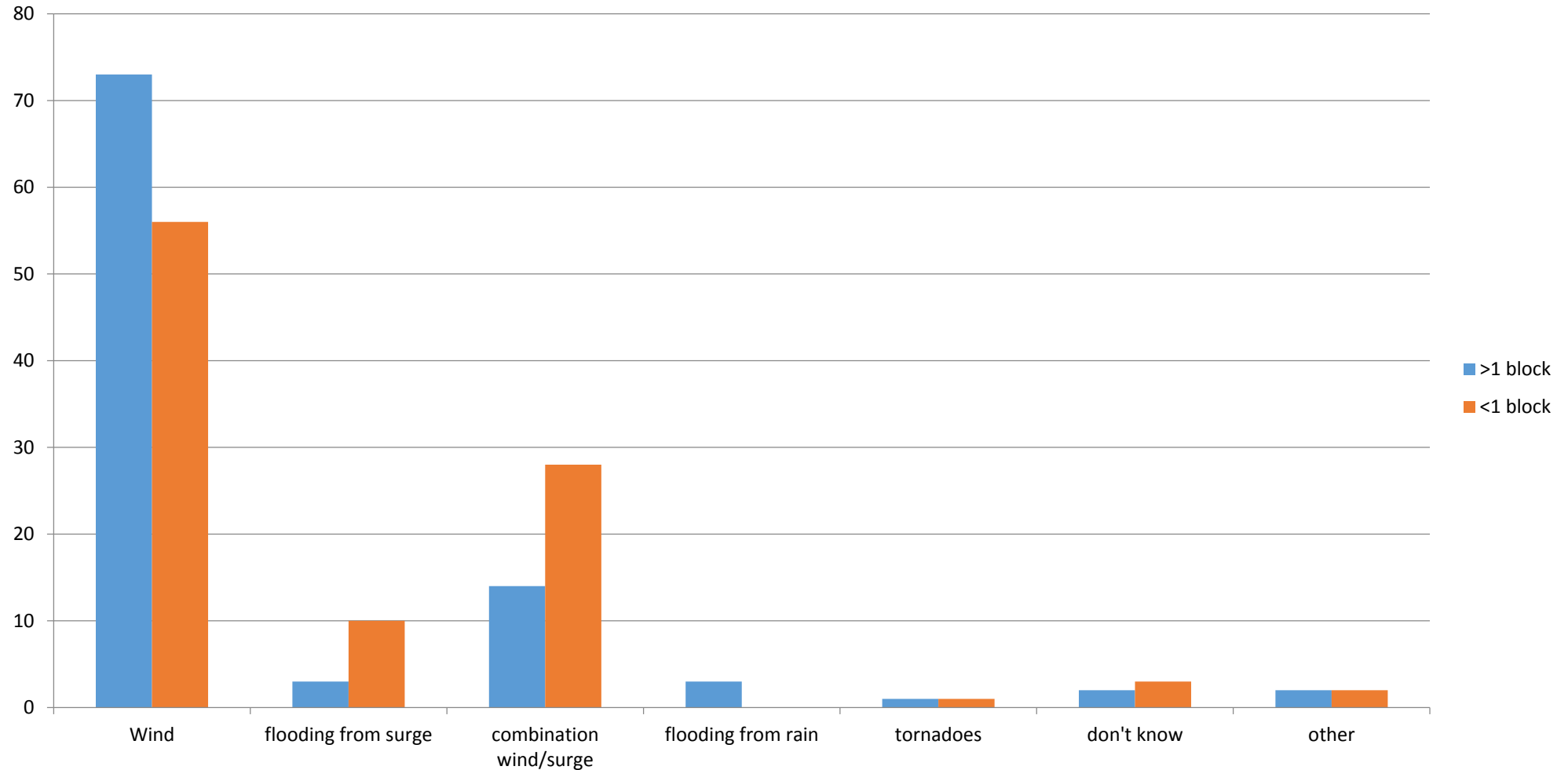
Hurricane Sandy: New Jersey Warned of 7- to 10- Day Power Outages

Oct. 27, 2012

By SYDNEY LUPKIN via **WORLD NEWS**

Bridgette Mooney, her daughter Skyler, 15 months, and husband Kevin watch from their home as Hurricane Isaac lashes their property with rain,

NEXT VIDEO »

Expectations of Power Outage
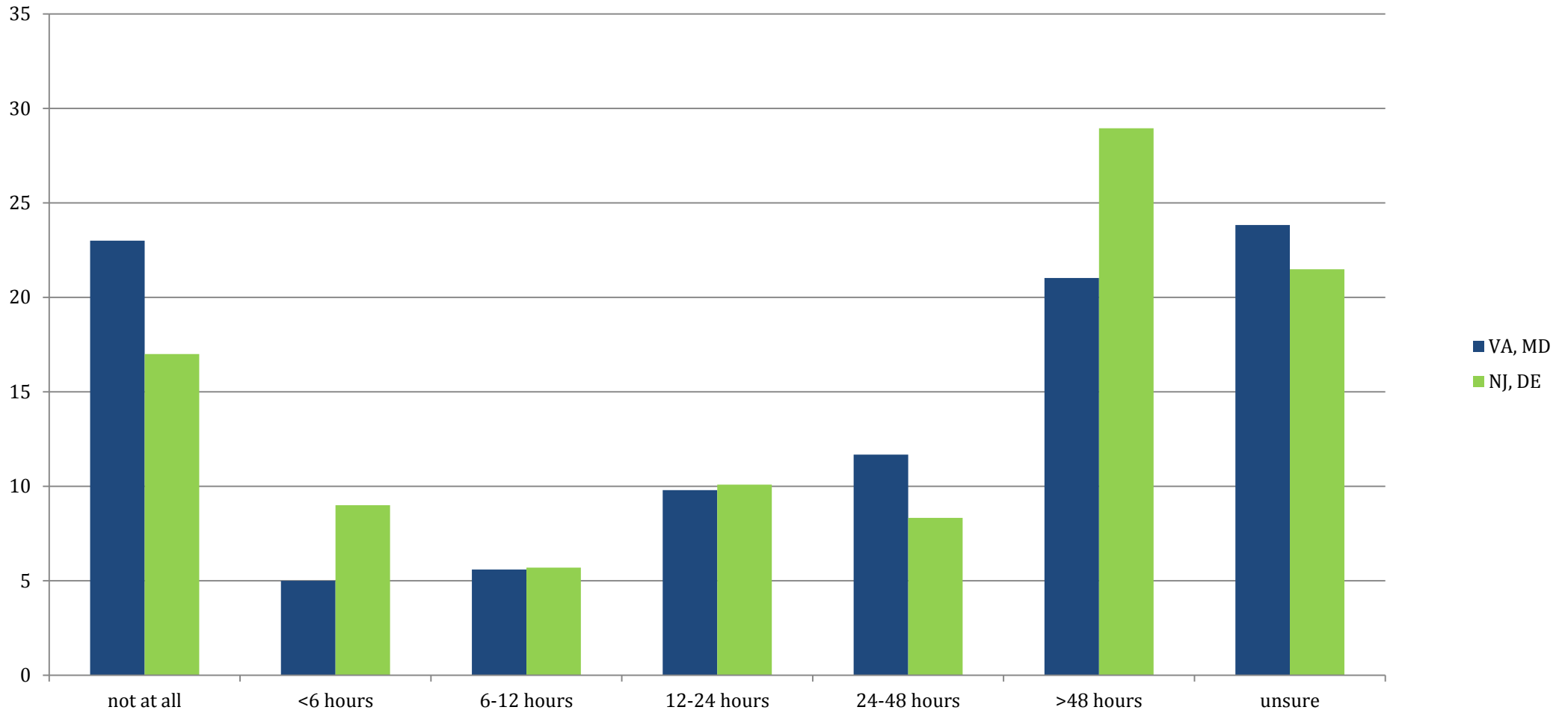
Another factor

- The absence of a strong emotional threat (fear factor)

Lot # 1553

Will People Learn? Probably not.

- What people will retain is the objective memory of the event.   What will fade quickly is the memory of the emotions---and it is the latter that spurs preventive action

Galveston and the Sea Wall

Response: A Protected City

The Great Sea Wall, Galveston, Texas.

Problem: seawalls make for ugly beaches

...solution for new residents: build outside the sea wall

Seawall

Seascape Condos

Same location after Hurricane Ike (2008)

Some Suggested Solutions

- **Core approach: decision architecture**
- **Rather than trying to persuade people to overcome biases, mold the information environment such that application of the biases lead to better choices**
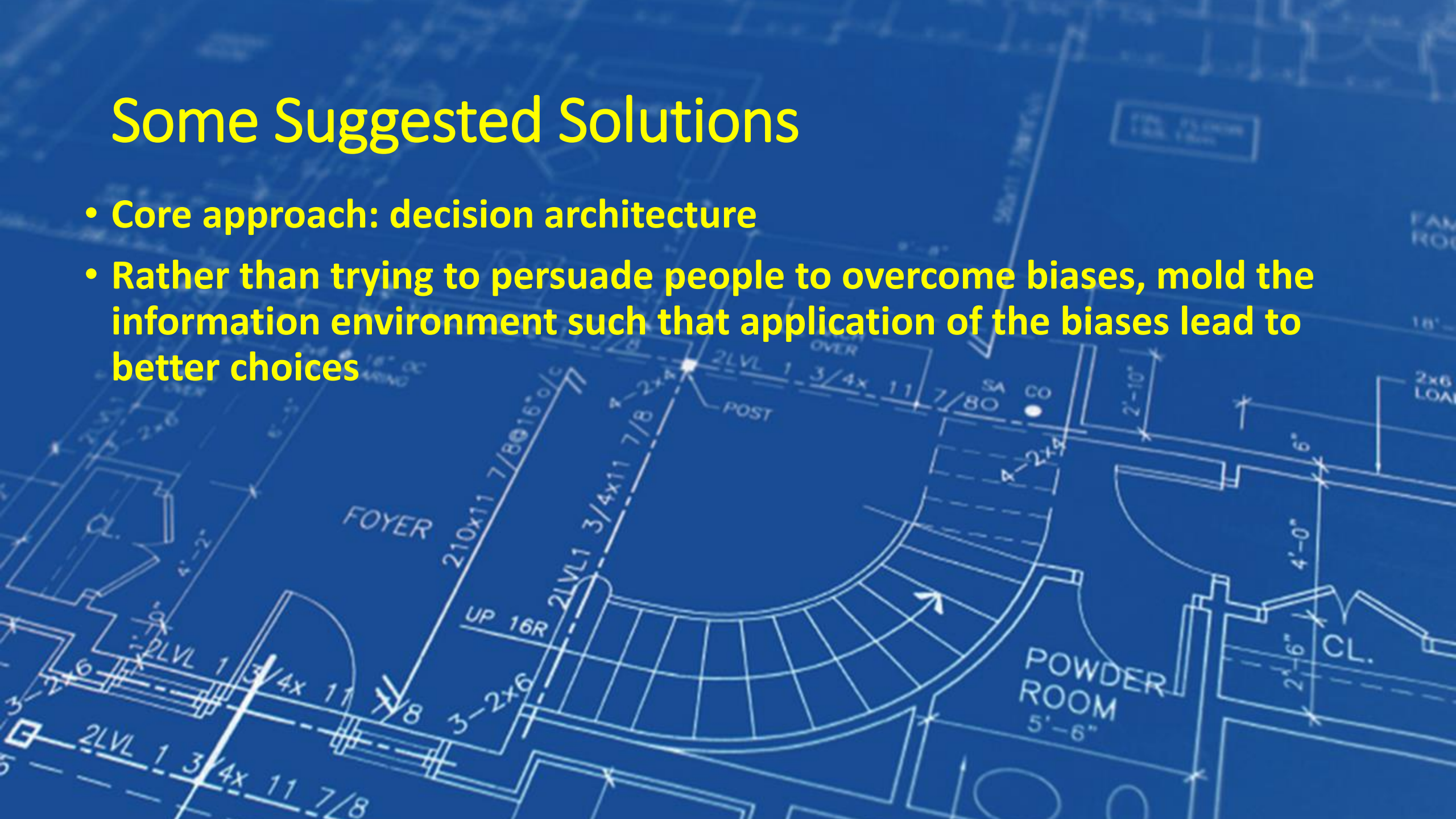
Examples

- Single-action bias
  - Given a threat for which a multitude of preventive actions are required, a tendency to believe that one action (or a small subset) suffices

Earthquake Preparedness Checklist

Once an earthquake strikes, it's too late to make emergency preparations. Use this checklist as a starting point to ensuring you and your family are ready when the time comes.

Before an Earthquake
Take protective measures to reduce the risk of personal injury and property damage before an earthquake strikes.

- Know the earthquake risk in your area
- Properly secure pictures, mirrors, shelves, and light fixtures
- Properly secure televisions, computers, and stereo equipment
- Fasten tall, heavy furniture to wall studs and ensure these items aren't in a location where they could fall over and block a crucial exit
- Secure heavy, breakable items
- Store hazardous materials in a secure place
- Properly secure kitchen, laundry appliances and water heater

Financial/Important Family Documents
Keep copies of records in a waterproof, portable container (or place in a secure location such as a safety deposit box).

- Social Security Cards
- Driver's Licenses and Passports
- Birth, Marriage and Death Certificates

- Will, Insurance Policies, Contracts and Deeds
- Current Photos of Family
- Emergency Contact List
- Immunization Records

- Bank and Credit Card Account Numbers, Stocks and Bonds
- Inventory of Valuable Household Goods (Include Appraisals, Photos and/or Video of Valuables)

Water and Food Supplies
Keep at least 3–7 days worth of food and water on hand.

- 1 Gallon of Water per Person/Day
- Canned Juices and Powdered Milk

- High-energy Snacks, Canned Meats, Fruits and Vegetables
- Food for Infants and Individuals with Special Needs

- Paper Plates, Cups and Utensils
- Non-Electric Can Opener, Cooking Tools and Fuel

Tools and Supplies
Check regularly to ensure that items followed by (*) are functioning properly and are easily accessible.

- Map of Area for Locating Shelters
- Battery-operated Radio*
- Flashlight and Batteries*
- Paper and Pen
- Fire Extinguisher*

- All-purpose Knife
- Set of Tools and Signal Flare*
- Plastic Sheeting and Plastic Storage Containers
- Tape (Duct and Masking)

- Candles and Matches in Waterproof Container
- Soap, Liquid Detergent and Hand Sanitizer
- Needle and Thread
- Garbage Bags and Ties

Clothing, Bedding and Personal Items
Keep these items in a waterproof container or bag.

- Change of Clothes and Sturdy Shoes or Work Boots
- Hats, Gloves and Rain Gear
- Blankets, Pillows and Sleeping Bags

- Prescription Glasses or Contact Lenses and Sunglasses
- Towels, Toilet Paper and Towelettes

- Personal Hygiene Items
- Infant Supplies (Diapers, Bottle, etc.)

First Aid Kit
Assemble a first aid kit for your home and your car. Keep a 3–7 day supply of vital medications.

- Prescription Drugs and Pain Relievers
- Antacid
- Sunscreen and Insect Repellent

- Antiseptic and Sterile Needles
- Sterile Adhesive Bandages and Gauze Pads
- Adhesive Tape

- Safety Pins (all sizes)
- Scissors and Tweezers
- Thermometer
- First Aid Manual

Other Recommendations for Earthquake Preparedness
- Designate an out-of-area emergency point person for friends and family to contact.
- Select an emergency meeting place in case your family is separated.
- Keep your vehicle fuel tanks filled, and know your community's evacuation routes.
- Learn about emergency plans for your children's school or day care.
- Keep cash on hand (banks and ATMs may not be open or available for extended periods).

Set up an emergency and disaster relief savings account and a Home Equity Line of Credit with Washington Mutual.

For more information on how to protect your family and home in the event of an emergency, log on to www.fema.gov.

Source: Federal Emergency Management Agency.

Home Energy Checklist

HVAC Systems

1. Outdoor Coil Condition   G F P*
2. Thermostat Location   G F P
3. Thermostat Setting: _____
4. Ceiling Fans Used: _____
5. Attic Fans Sealed   Y N
6. Room Doors Open   Y N
7. Supply Registers Open   Y N
8. Return Vents Accessible   Y N
9. Return Filter Clean   G F P
10. Space Heaters Used   Y N

Appliances

1. Water Heater Temperature: _____
2. Water Heater Wrap   Y N
3. Hot Water Pipe Wrap   Y N
4. Heat Tape   Y N
5. Refrigerator Gaskets & Coils   G F P
6. Dishwasher/Self-Heating   Y N
7. Dishwasher/Air Dry   Y N
8. Clothes/Cold Wash   Y N
9. Dryer Int./Ext. Vent Seal   G F P
10. Dryer Vent Condition   G F P

Lighting

1. Incandescent lights: _____
2. CFLs in use: _____
3. 24/7 Nite Lights in use: _____

Good, Fair or Poor

Air Infiltration & Insulation

1. Window Condition   G F P
2. Window Caulking   G F P
3. Door Condition   G F P
4. Door Weatherstripping   G F P
5. Storm Doors   G F P
6. Plumbing Penetration   G F P
7. Fireplace #____, Type: _____
8. Fireplace Damper Closed   Y N
9. Attic Insulation R-Value: _____
10. Insulation Condition   G F P
11. Attic Access Seal   G F P
12. Recessed Light Seals   G F P
13. Recessed Light Insulation   Y N
14. Window A/C Sash Seal   Y N
15. Basement Window Seal   Y N
16. Duct Insulation, R-Value: ____ G F P
17. Duct Leakage Apparent   Y N
18. Crawl Space Insulation   G F P
19. Crawl Space R-Value: _____
20. Concrete Above Grade   Y N
21. Foundation Insulation   G F P

Miscellaneous

1. Pool Pump/Hot Tub/Jacuzzi   Y N
2. Well Pump   Y N
3. Tank Heaters   Y N
4. Extra Freezer(s) # _____   Y N
5. Extra Refrigerator(s) # _____   Y N
6. TVs, # _____ Type: _____
7. Home Office   Y N

Better---simplify and order

May 06

Invest in Energy Efficiency

Got a Minute?
- Look for the ENERGY STAR label when buying new appliances.

Got a Morning?
- Learn how to heat and cool your home more efficiently on the ENERGY STAR website. Then grab your utility bills and use the online tool to evaluate your home's energy use and get recommendations for energy-saving home improvements.

Got a Month?
- Sealing and insulating your home is the most cost effective way to reduce your energy bills. Seal cracks, gaps and holes and add insulation. New ENERGY STAR doors, windows and skylights use the latest technology to save energy and protect your home.
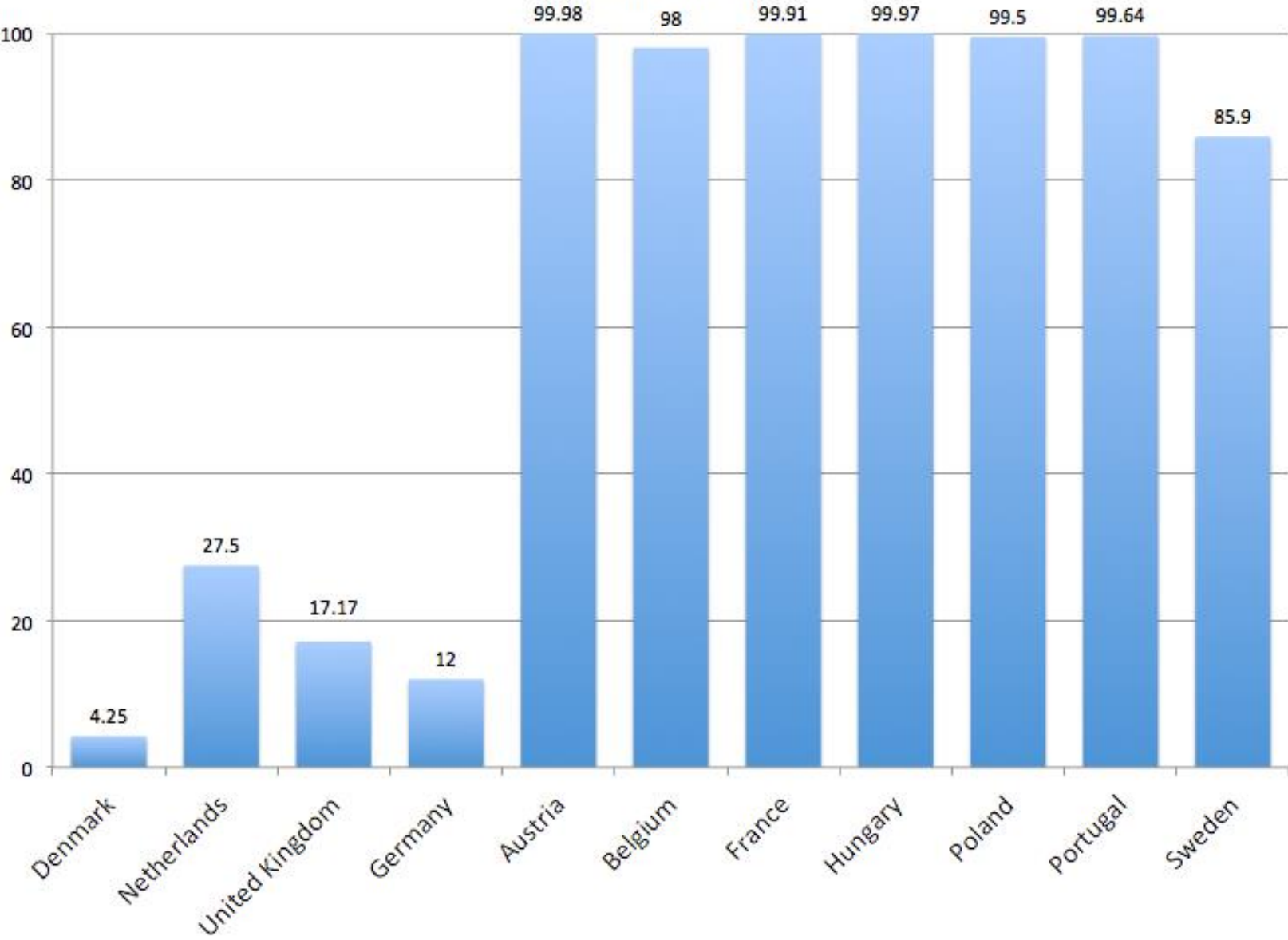
Improve mental models

- Example: shift storm warning information away from characterization of the STORM to the LOCAL IMPACT of the storm and required actions

Make safety the default choice

Rate of Consent

Applications

- Tie property insurance policies to the dwelling, not the home owner
- In hurricane/earthquake areas: annual protection kits funded by RE taxes that one can opt-out of

Long-term protective decisions

- Case: sea-level rise and protective investment in Miami-Dade, FL

Possibly a reassurance:

- If there is one thing that humans have done well through history, it is adapt to environmental change
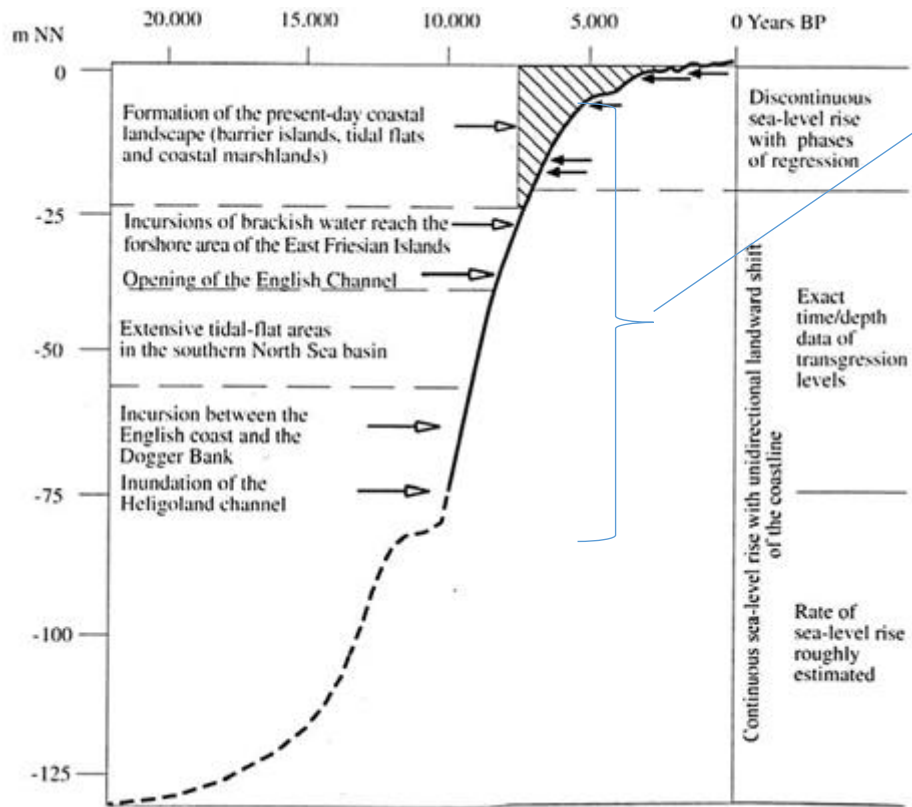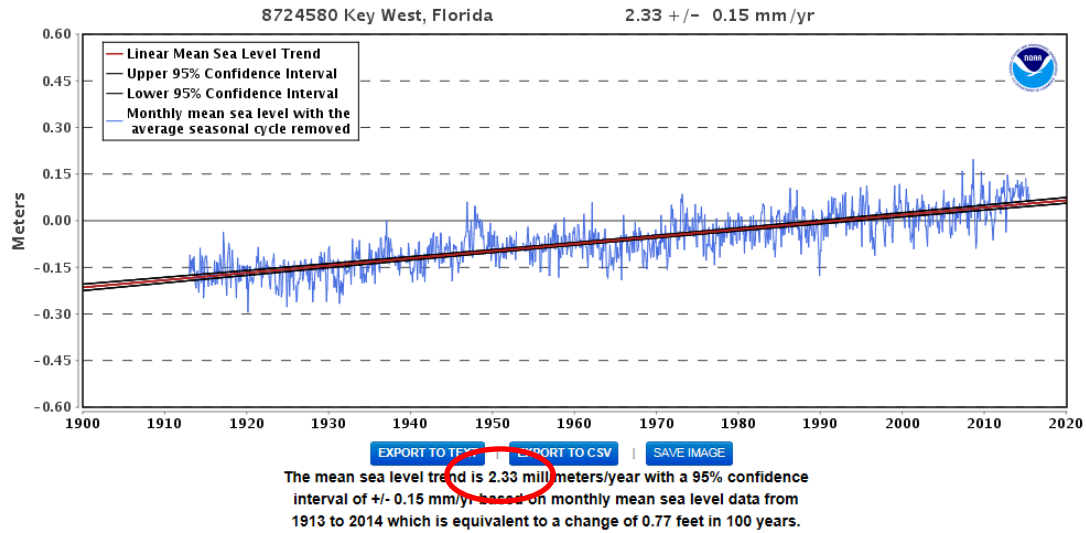
Example: Northwest Europe 16,000 years ago

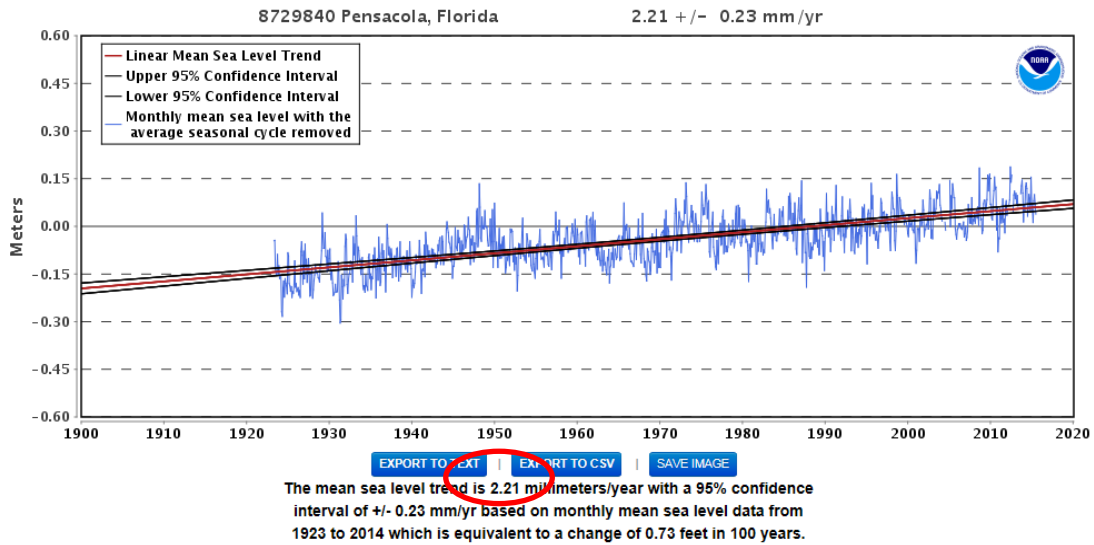In 7,000 BC one could walk from France to England

20mm per year

m NN

| 20.000 | 15.000 | 10.000 | 5.000 | 0 Years BP |

0

Formation of the present-day coastal
landscape (barrier islands, tidal flats
and coastal marshlands)

Discontinuous
sea-level rise
with phases
of regression

-25

Incursions of brackish water reach the
forshore area of the East Friesian Islands

Opening of the English Channel

Extensive tidal-flat areas
in the southern North Sea basin

Exact
time/depth
data of
transgression
levels

-50

Incursion between the
English coast and the
Dogger Bank

Inundation of the
Heligoland channel

-75

Continuous sea-level rise with unidirectional landward shift
of the coastline

Rate of
sea-level rise
roughly
estimated

-100

-125

Mean Sea Level Trend
8724580 Key West, Florida

8724580 Key West, Florida   2.33 +/- 0.15 mm/yr

The mean sea level trend is 2.33 millimeters/year with a 95% confidence interval of +/- 0.15 mm/yr based on monthly mean sea level data from 1913 to 2014 which is equivalent to a change of 0.77 feet in 100 years.

Mean Sea Level Trend
8729840 Pensacola, Florida

8729840 Pensacola, Florida   2.21 +/- 0.23 mm/yr

The mean sea level trend is 2.21 millimeters/year with a 95% confidence interval of +/- 0.23 mm/yr based on monthly mean sea level data from 1923 to 2014 which is equivalent to a change of 0.73 feet in 100 years.

RCP6.0
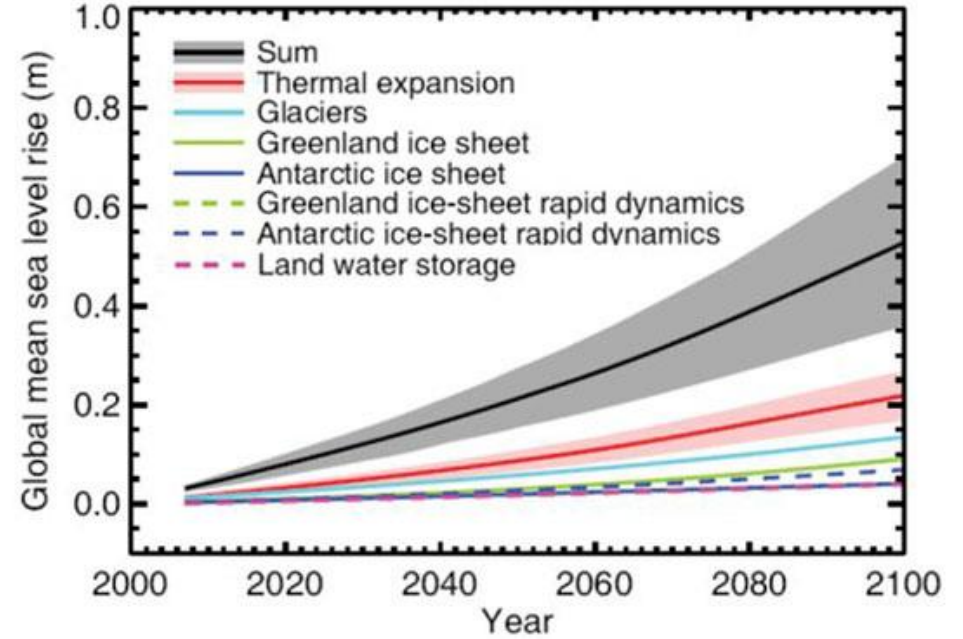
6mm/year

So why worry?
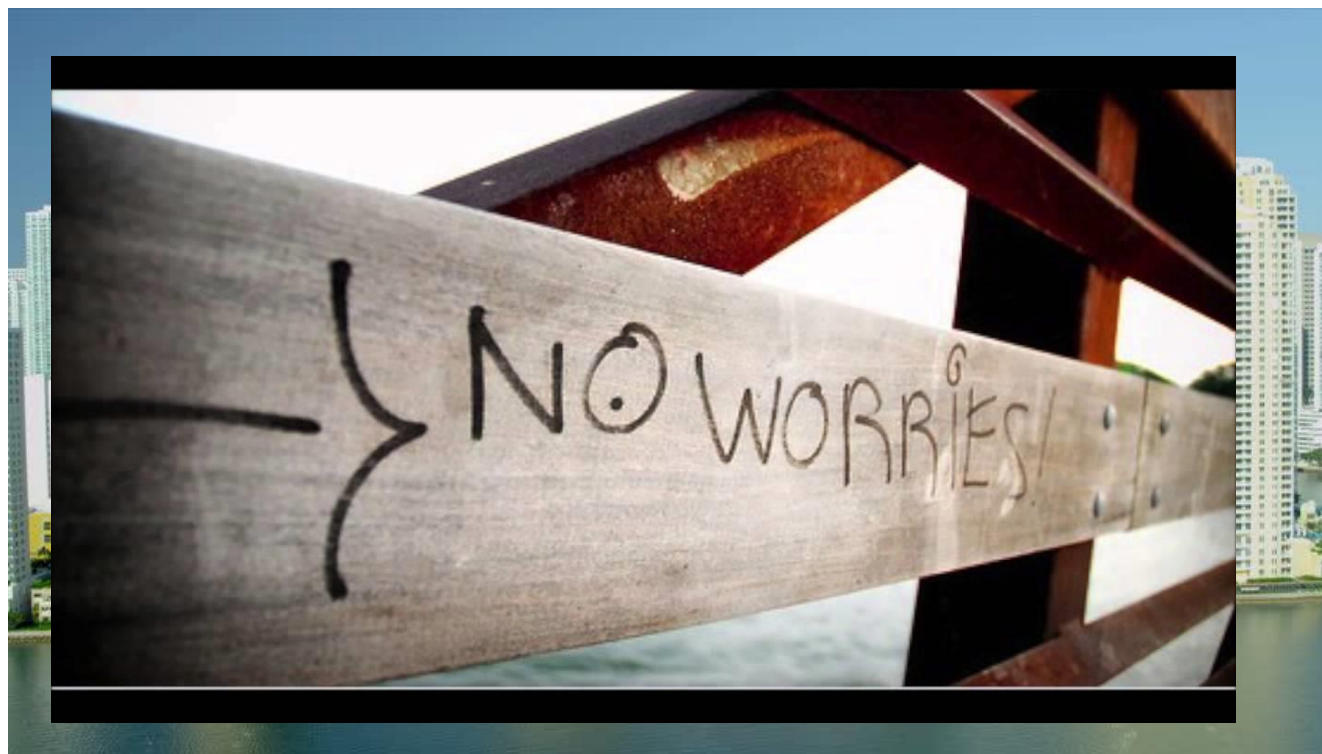
Viscyaya-Cleopatra's Barge

1967

2013

The bathtub problem

The relationship between SLR and flooding is nonlinear
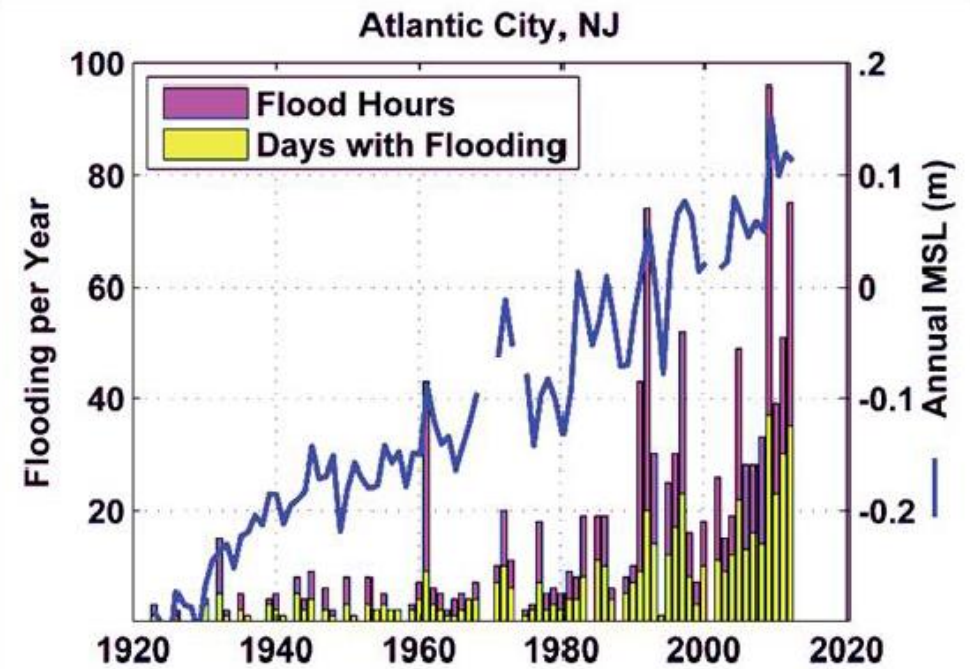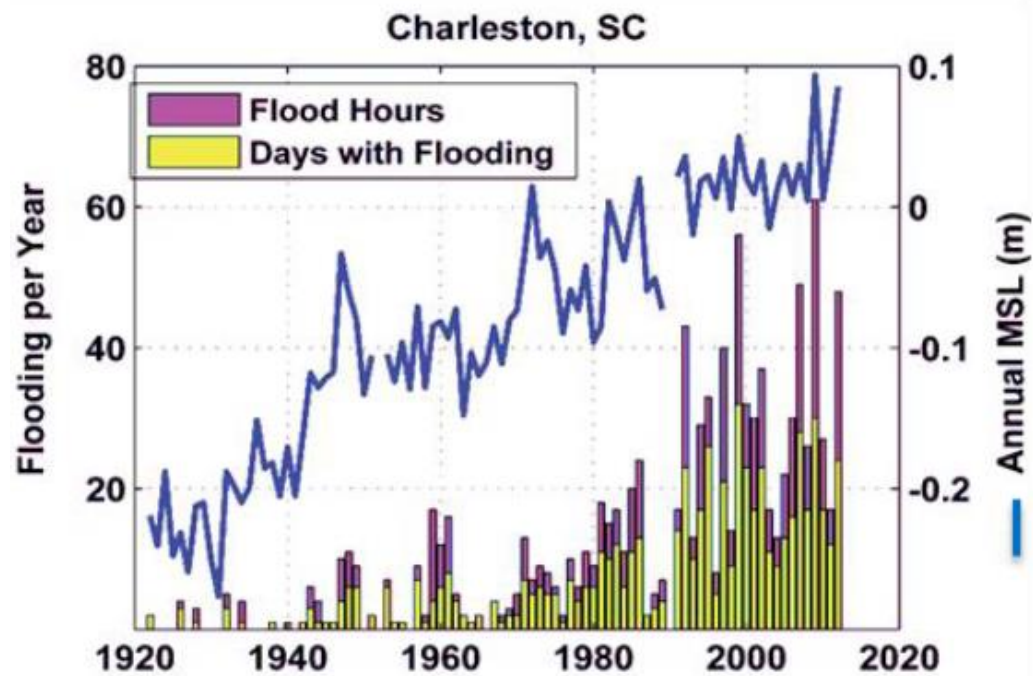
How to encourage long-run thinking

- Close the distance between the current and future self

How to encourage long-run thinking

- Make future outcomes be more salient

How to encourage long-run thinking

- Probably NOT a good idea: inflate the fear factor

The dilemma (S. FL version)

Questions?