

## SAFT 210: Introduction to Emergency Management

Week Five:  
Disciplines of Emergency  
Management: Mitigation

## Review

## Practical Evolution: Risk Assessment

## Articles.....



## Disaster Loss Facts and Figures

- 1990-1999 Disaster Assistance in the US about \$25.4 Billion
- \$608 billion worldwide
- More than the previous four decades combined

## Causes????

- El Niño
- Global warming
- Rise of sea level
- Increased development
- Deforestation
- Migration to hazard prone areas

## Definition

- Mitigation is defined as:
  - The sustained action to reduce or eliminate risk to people and property from hazards and their effects

## Hazard vs. Hazard

- Mitigation has proven track record for natural hazards
- Mitigation for technological hazards is still evolving
- But.....
  - Many mitigation practices can be applied to technological hazards as well

## The Difference

- Mitigation differs from other disciplines
- Looks at long term solutions to reduce hazards as opposed to preparedness for, response to or recovery from hazards
- However.....

## Recovery is.....

- The best opportunity for mitigation
- This phase has historically provided for the greatest funding for mitigation
- New focus is on pre-disaster mitigation
- What act.....

## Thought Process

- Mitigation is a more administrative approach
- Differs from the skills needed for response
- Therefore some Emergency Managers have been reluctant to embrace mitigation
- "I won't lose my job for failing to mitigate, but I might lose my job if a botch a response"

## Early Leaders

- The fire community were the early leaders in mitigation through
  - Supporting fire and building codes
  - Code enforcement
  - Fire prevention
  - Public Education

## Emergency Management

- Have remained much in focus of their response and recovery
- Trend is changing because:
  - Federal leadership
  - Larger scale disasters
  - Increase in funding
  - Professionalism of the EM field (CEM)

## Strides Over the Years

- Building Codes
- Warning Systems
- Public education
- Casualties have decreased
- Economic effects, property loss and damages have escalated

## Technological Hazard Mitigation

- Terrorist or intentional events are difficult to analyze
- Speculation that intelligence and security can decrease these hazards
- Belief that traditional techniques like building codes can be applied to terrorist events

## Technological Hazard Mitigation II

- Other technological hazards have been successfully mitigated:
  - Exxon Valdez
  - Three Mile Island
    - Mitigated through better inspections
    - Equipment and personnel increase
    - Training
    - Exercises

## TOOLS FOR MITIGATION

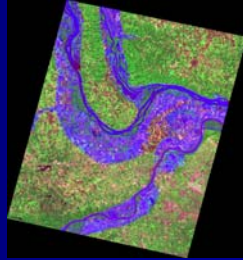
- Hazard Identification and mapping
- Design and construction applications
- Land-Use planning
- Financial incentives
- Insurance
- Structural controls

## 1. Hazard Identification and Mapping

- The most obvious tool for mitigation?
- You can't mitigate it if you don't know whom or what it affects
- Hazard identification (analysis) is the most essential part of any mitigation strategy
- Many resources available

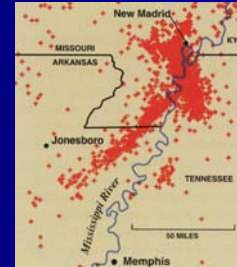
## NFIP

- Provides:
  - Detailed flood maps
  - Studies
  - Given to communities to identify flood planes and vulnerable areas



## United States Geological Survey (USGS)

- Provides:
  - Earthquake maps
  - Landslide detail maps
  - Studies



## Geographic Information Systems (GIS)

- Beginning to be staples of local planning organizations
- Layers of data placed over a map
- Humans and development often left out of the maps
- This making it a quantified analysis

## Hazard, United States (HAZUS)

- Developed by FEMA
- Nationally applicable method for estimating losses from earthquakes
- Can be applied to the local or regional level
- Currently being expanded to cover hurricanes, wind losses and floods

## 2. Design and Construction Applications

- One of the most effective means of addressing risk
- Governed by codes, architecture and design criteria
- Differ regionally
- Rarely implemented

## 3. Land-Use Planning

- Mitigation programs most successful when undertaken at the local level
- Many different strategies for land use planning
  - Acquisition
  - Easement
  - Storm water management
  - Annexation
  - Environmental review
  - Floodplain management

## Land-Use Planning II

- One of the earliest tools used to encourage mitigation
- 1968-Congress passed the National Flood Insurance Act that established the NFIP

## Acquisition

- The MOST effective land-use planning tool
- This means moving purchasing structures in flood prone areas and moving them out of harms way
- After the Mid-west floods of 1993 FEMA worked with Congress to increase funding for acquisition after a disaster

## Land-Use Examples

- North Carolina Set-back Ordinance
  - Seeks to preserve fragile eroding coastline of barrier islands
- The Alquist-Priola Act of California
  - Prevents development near known earthquake faults

## 4. Financial Incentives

- New emerging area for promoting mitigation
- Some communities using special tax assessments, passage of tax increase to pay for mitigation, relocation assistance and targeting federal community development or grant funds fro mitigation

## Examples

- Tulsa, Oklahoma and Napa California
  - Passed tax increases to pay for flood mitigation after repeated flooding
- Berkeley, California
  - Passed 10 different bond issues support seismic retrofit of public buildings, schools and private residences

## Community Development Block Grant (CDBG)

- A Housing and Urban Development (HUD)
- Used to support local efforts at property acquisition and relocation
- Used to match funds

## 5. Insurance

- Debated as a mitigation tool
- Really only transfers risk from the individual or community to the insurance company
- The NFIP is considered to be one of the most successful mitigation programs ever created

## The National Flood Insurance Program (NFIP)

- Created by Congress in response to damage from multiple flood events and hurricanes and the rising costs of disaster assistance after floods
- Voluntary program that provides low cost federally backed flood insurance if communities participate in flood plain management hence the Community Rating System (CRS)

## 6. Structural Controls

- Controversial as a mitigation tool
- Mostly used to protect existing development
- Can have positive and negative impacts
- Used to control the hazard...not to reduce it

## The Levee

- The most common form of structural control
- Most designed and built by the Army Corps of Engineers
- Part of the aging infrastructure of America
- They have their limitations
- Useful in low lying areas, not necessarily flood-prone areas

## Other Structural Control Examples

- Coastal protections:
  - Jetties
  - Bulkheads
  - Breakwaters
    - Are controversial, can protect one area, but threaten another

## IMPEDEMENTS TO MITIGATION

## The Philosophical Question

- If so many tools can be applied, why haven't risk-reduction and mitigation programs been more widely applied?
  - Denial of risk
  - Political will
  - Cost
  - Lack of funding
  - Complacency

## FEDERAL MITIGATION PROGRAMS

## Federal Mitigation Responsibilities

- FEMA is the primary agency
- There are others:
  - Small Business Administration
  - Housing and Urban Development
  - Environmental Protection Agency

## 1. The Hazard Mitigation Grant Program (HMGP)

- The largest source of funding for state and local mitigation activities
- Provides grants to state and local governments to implement long term hazard mitigation programs AFTER a major disaster has been declared by the President
  - Must reduce the risk
  - Benefits MUST exceed the costs

## Examples of Support under HMGP

- Acquisition
- Retrofitting of structures and lifelines
- Elevation of structures
- Vegetation management programs
- Code enforcement
- Local flood control projects
- Public education and awareness

## HMGP Evolution

- Enacted by Congress in 1988 as part of the Robert T. Stafford Act
- Created cost sharing of disaster assistance by states
- Not many states took advantage of the program
- Allowed states to hire staff to work on a State Hazard Mitigation Plan
- Changed the face of some state and local emergency management

## 2. Pre-Disaster Mitigation Program (PDM)

- Disaster Mitigation Act of 2000
  - Congress approved creation of a Pre-Disaster Mitigation program to provide mitigation funding NOT dependant on a disaster declaration

## The Goal

- Called Project Impact: Building Disaster-Resistant Communities
- Grew from devastating disasters in the 1990's
- Many communities took months and years to recover

## PROJECT IMPACT

- Launched in 1997
- Started in seven pilot communities
- The concept was that mitigation is tailored to hazards in that community
- All sectors of the community had to be involved

## Program Goals

- Build a community partnership
- Assess the risks
- Prioritize risk-reduction actions
- Build support through communicating your actions

## Project Impact Success Stories

- By 2001-200 communities participating
- Congress had approved 25 million
- In 2002 a m 6.8 earthquake struck Seattle the may attributed their success in Project Impact for the minimal damages and prompt recovery

## 3. The National Earthquake Hazard Reduction Program

- The goal if the NEHRP is to reduce the risks to life and property from future earthquakes in the US through the establishment and maintenance of an earthquake hazards reduction program
- FEMA is the lead, others participate:
  - National Institute of Science and Technology
  - National Science Foundation
  - USGS

## How it Works

- Improve understanding
- Characterization and prediction of hazards and vulnerabilities
- Improve model building codes and land use practices
- Reduce risk through investigation and education
- Develop and improve construction
- Improve mitigation capacity
- Accelerate research results

## 4. The National Hurricane Program

- FEMA supported activities at the local, state and federal levels
- Focuses on physical effects of hurricanes
- Improved response capabilities
- New mitigation techniques for the built environment
- Significant work done in modeling and evacuation planning

## 5. The National Dam Safety Program

- Created in 1996-The National Dam Safety Program Act
- Director of FEMA is the coordinator
- Initiatives:
  - Funding to maintain Dams
  - Training for state Dam inspectors
  - Research
  - Public Education
  - Establishment of the National Dam Safety Review Board

## 6. The Fire Prevention and Assistance Act

- Created in 2001
- Addresses the needs of paid and volunteer fire departments
- Supports prevention activities
- As a result of 9/11 the appropriations for this program tripled in 2002

## Assistance to Firefighters Grant Program

Categories	No. of Awards	Amount
Fire Operations & Firefighter Safety	506	\$ 31, 15, 961
Fire Prevention	76	\$3,330, 848
Firefighting Vehicles	158	\$19,643,175
Emergency Medical Services	4	\$57,067
Total	744	\$55,463,051

## Conclusion

- Disasters occur in every state
- Direct costs are staggering
- Sustainable programs make communities safer
- Mitigation programs exist at all levels of government
- Even in this time, when terrorism occupies the psyche of emergency management, mitigation is –and should be- the future direction of emergency management

## Review

- What is the definition of mitigation?
  - The sustained action to reduce or eliminate risk to people and property from hazards and their effects
- What are the six tools for mitigation?
  - Hazard identification and mapping, Design and construction, land-use planning, financial incentives, insurance, structural controls
- What are the six Federal Mitigation Programs?
  - Hazard mitigation grant program, Pre-disaster mitigation program, national earthquake hazard reduction program, national hurricane program, national dam safety program and fire prevention and assistance act

QUESTIONS???