Risk Perception
Module 2 – RC for FRM course

10:00-10:15 am Aug 20, 2012
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Definition of Risk

Risk = \textit{Probability} \times \textit{Consequences}

(as calculated by Scientist/Engineer)
Definition of Risk

Risk = Hazard & Outrage

(as perceived / felt by individuals)

- More comprehensive
- What people care about
- Value laden => tolerable risk
How are these risks different?
Which words give you a sense of danger, even to a small degree?

- Airplanes
- Chemicals
- Ice
- Guns
- Hospitals
- Dogs
- Alcohol
- Pretzels

Source: David Ropiek
Examples of Different Risk Communication Contexts

- Vaccines
- Nuclear radiation
- Gen Mod Food

- Outrage Management
- Crisis / Emergency Communication
- Public Relations
- Precaution Advocacy

- Outrage:
  - (fear, anger)

- Hazard:
  - Low
  - High

- Heart disease
- Climate change
- Cell use while driving
(A Few) Risk Perception Factors

- Individual
  - Catastrophic
- Familiar
  - Unfamiliar
- Voluntary
  - Involuntary
- Fair/equitable
  - Unfair/inequitable
- Immediate
  - Delayed
Model of Risk Perception

Factor 1: Unknown risk
- DNA Technology
- Radioactive Waste
- Asbestos Insulation
- Auto Exhaust (CO)
- Large Dams
- Skyscraper Fires
- Auto Accidents
- Handguns

Factor 2: Dread

Outrage Management
- Microwave Ovens
- Water Fluoridation
- Saccharin
- Antibiotics
- Caffeine
- Lead Paint
- Skateboards
- Trampolines
- Downhill Skiing
- Bicycles

Precaution Advocacy

Source: Paul Slovic (1987 data)
Factors Explained

Factor 1: (Un)known Risk
- Observable or not
- Known to those exposed or not
- Effect immediate or delayed
- Old or new risk
- Risks known to science or not

Factor 2: Dread Risk
- Controllable or not
- (Not) dreaded
- (Not) global catastrophic
- (Not) fatal
- Equitable or not
- Individual or catastrophic
- Low or high risk to future generations
- Easily reduced or not
- Risk decreasing or increasing
- Voluntary or involuntary
Tolerable Risk

- **Unacceptable Region**: Risk cannot be justified except in extraordinary circumstances.
- **Tolerable Region**: People and society are prepared to accept risk in order to secure benefits.
- **Broadly acceptable Region**: Risk regarded as insignificant, further effort to reduce risk not required.

Increasing individual risks and societal concerns.
Additional Factors that Affect Outrage & Acceptability

- Degree of Risk Aversion
- Trust in institutions
- Media attention
- Accident history
- Benefits
- Origin
- Emotions; Denial
WHAT HAS YOUR EXPERIENCE BEEN IN FLOOD RISK MANAGEMENT?
Applying the principles

Opening the floodway?
Building a new levee?
Channel deepening?
A drowning at a Corps lake?
Improving fish habitat on a waterway?
Asian carp in Lake Michigan?

Which factors do or don’t come into play?
Scientist - Consumer Disconnect

**SCIENTIST EXPERT**

*knows*

*thinks*

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**CONSUMER PUBLIC**

*feels*

*believes*

Fact-based:  
*hazard, probability*

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Value-based:  
*consequences, importance of what may be lost*
Outrage Factors Affecting Acceptability

- Catastrophic potential
- Familiarity
- Understanding
- Controllability
- Voluntary exposure
- Effects on children
- Manifestation of effects
- Victim identity
- Dread
- Trust in institutions
- Media attention
- Accident history
- Equity
- Benefits
- Reversibility
- Origin
Risk is Inherently Subjective

Risk does not exist “out there,” independent of our minds and cultures, waiting to be measured. Human beings have invented the concept “risk” to help them understand and cope with the dangers and uncertainties of life.

- Paul Slovic, 1992

Risk Communication must recognize that different groups & individuals will have different, subjective concepts of Risk
Risk Perception and Attitudes Related to Flood Risk Mgt

- **Risk Attitudes:**
  - Degree of risk aversion
  - Voluntary or not
  - Catastrophe potential

- **Perception of Flood Risk**
  - Probability of a loss
  - Magnitude of potential adverse consequences

Source: Improving the Corps of Engineers’ Contribution to Flood Risk Mgt. 2012 Interim Report. Figure 2-2.