



NOTRE DAME
OF MARYLAND
UNIVERSITY



Wanted: USACE Risk Managers

Charles Yoe

Professor of Economics

Notre Dame of Maryland University

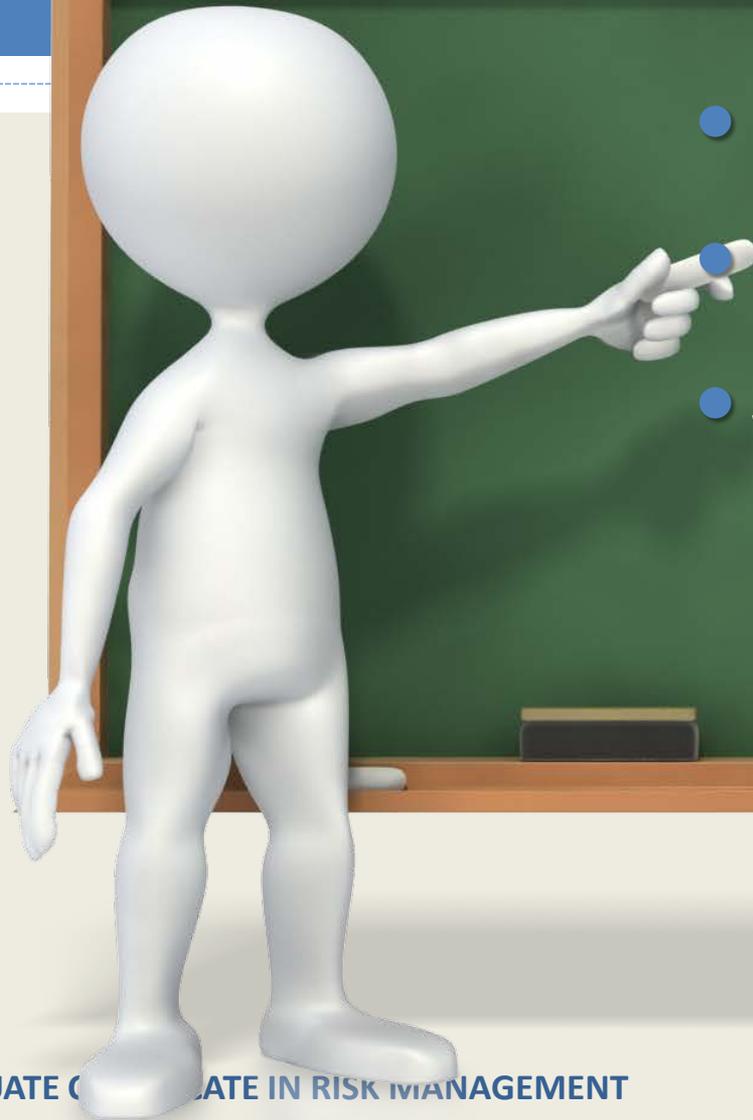
Atlanta, GA

June, 2015

GRADUATE CERTIFICATE IN RISK MANAGEMENT



NOTRE DAME OF MARYLAND UNIVERSITY



- **Planning is changing**
- **Uncertainty = Risk**
- **Stepping up to Risk Management**





Planning has
changed since the
P&G in 1983.

- Changing world
- Changing values
- Planning's evolution
- Technology
- Economic pressure
- Public involvement
- Science & uncertainty
- Emergence of risk



Changing World



- Issues-new, riskier, complex, global
- Political transformations
- Competitive, interdependent, constantly changing
- Life is accelerated
- Change=>Uncertainty



Changing Values



- Ecosystem health, public safety, social vulnerability, environmental service provision, development patterns, recreational, aesthetic, health impacts, cost effectiveness, civic engagement, institutional capacity building, environmental justice/equity, carbon & energy impacts, ecological footprint, vulnerability impacts
- Changing values=>Uncertainty

Planning Evolves



- Watershed, ecoregional, ecosystem management
- Return to multiobjective & mutipurpose
- Monetary & nonmonetary
- Aligning expectations
- Sustaining planning
 - Fewer career planners
- Evolution=>Uncertainty

Technology



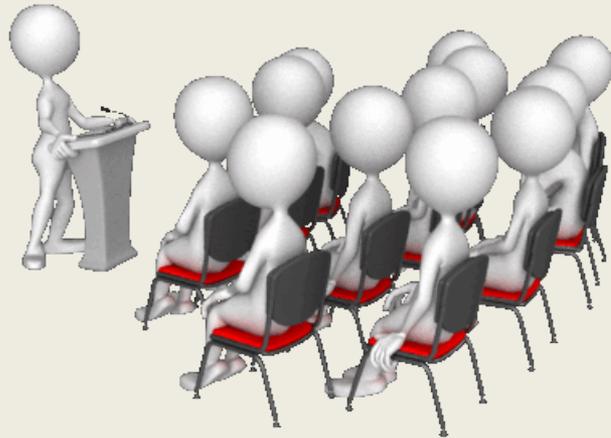
- More technology
- New technology - nanotech, genome, robotics, megadata, GIS, LIDAR, and on
- Technological change=>Uncertainty

Economic Pressure



- Aging infrastructure
- Few new starts
- New financing needed
- Organizations hitchhike on your study
- Less time & money
- Economic pressure=>Uncertainty

Public Involvement



- More stakeholders
- Expectation of meaningful involvement
- More collaboration
- Equity, efficiency, affordability, intense opposition are constants
- Public sentiment=>Uncertainty

Science & Uncertainty



- Science-based decisions
- Measurement importance
- Greater emphasis on uncertainty
- Data's shorter shelf life
- Future feels more uncertain



Emergence of Risk



- 1975 Rasmussen Report
- 1980 Benzene Case
- 1983 FDA contracts with NAS –Red Book
- 1983 EPA Uses Red Book
- 2006 Actions for Change
- Decision making under uncertainty



Risk and Planning



- It is because of these changes that it is time to integrate risk analysis principles into the planning process
- Be intentional about uncertainty



Plan A costs \$171,000,000

That levee will be there 1000 years from now

float preconstructed components to the project site before uncertainty, with no shipping

EAD = \$1,000

Water quality effects are negligible

We are on schedule

Plan B costs \$209,000,000

H&H will cost \$200,000,000

We will have costs July 17

We can get by with an EA

The BCR is 1.64

There are no HTRW





- That was never true
- We were often wrong
- Uncertainty has always been our reality

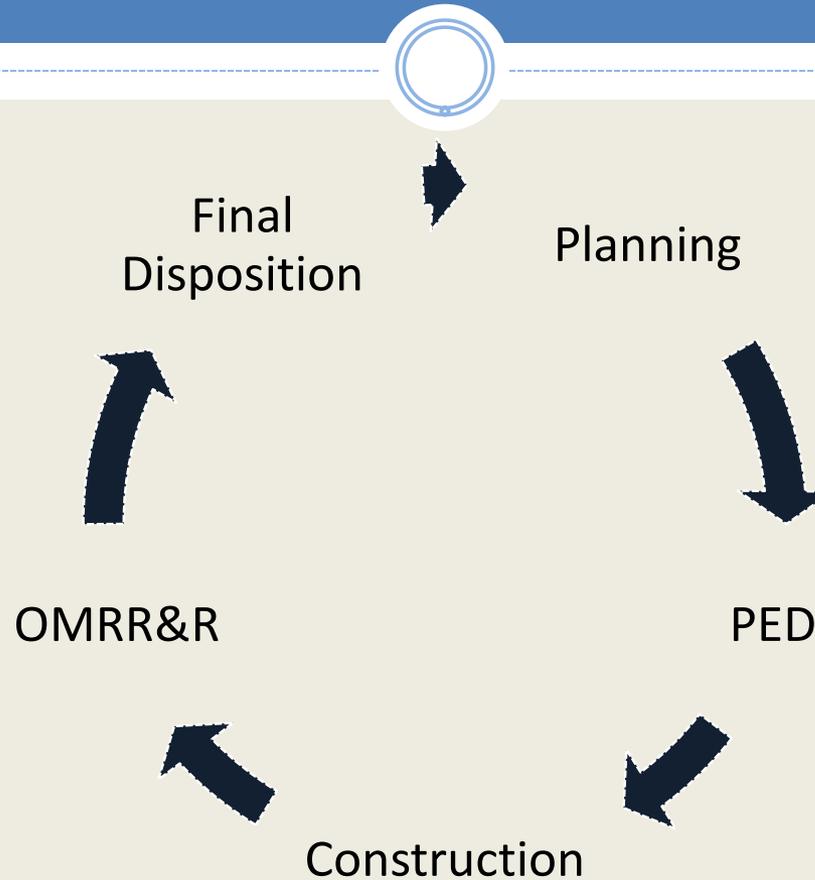




It is a fact of life.



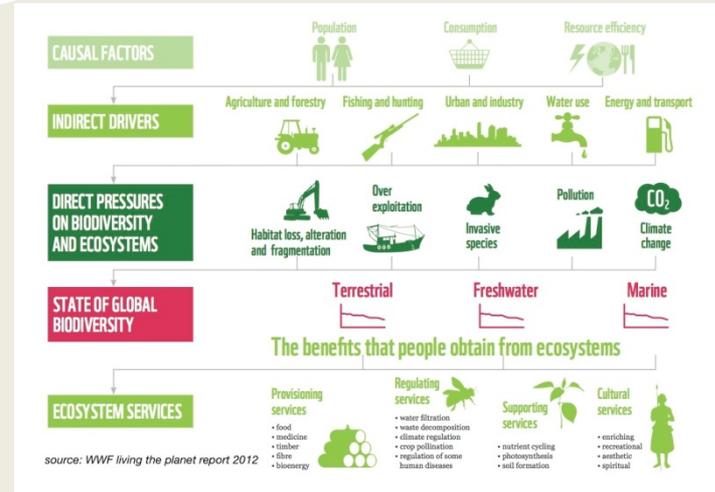
Uncertainty Runs Throughout Project Life Cycle



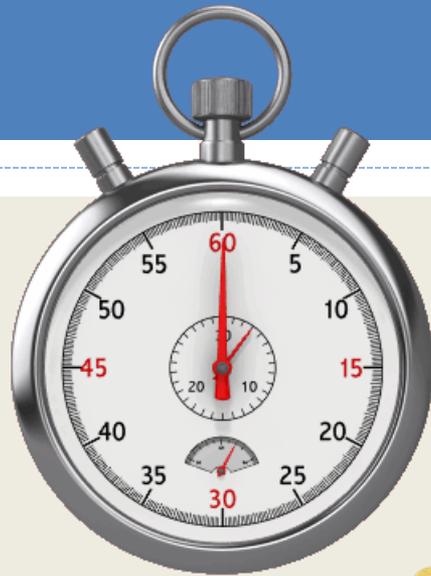
And it gives rise to risks!



Risks in Community



Study Risks



- Analytical error
- Study delays
- Study cost increase
- A poor planning decision

Implementation Risks



- Schedule
- Cost
- Construction



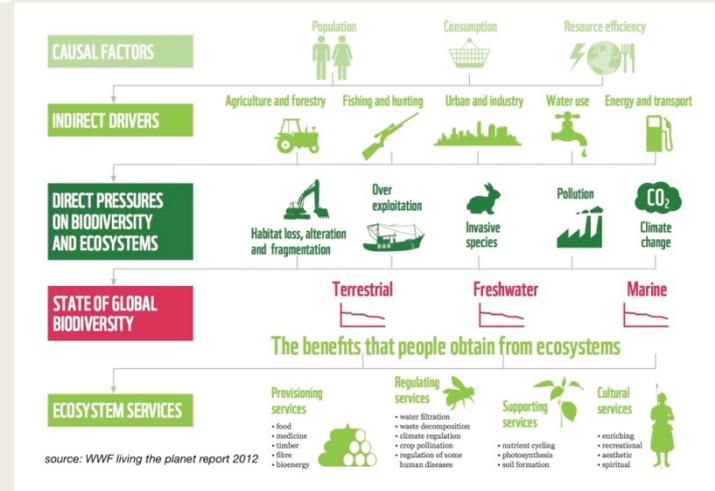
Operation Risk



- OMRR&R costs
- Project performance



Outcome Risks

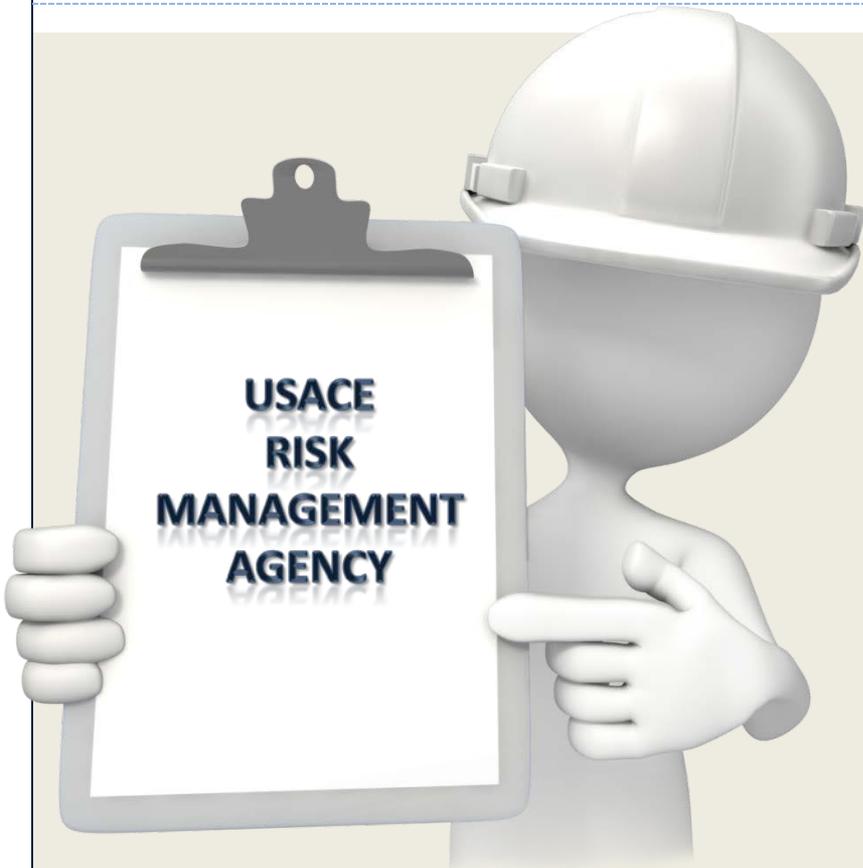




The only alternative to
risk management is
crisis management.



You Need A Process



- USACE needs an enterprise risk management model
- Manage risk throughout the project life cycle
- Continuous decision making under uncertainty



The goal is to use the data you have for the decisions you need to make. You don't need a project life's worth of data to make planning decisions. Neither do you need design data.



Risk management is an ongoing process.



No Perfect Answers in Planning



Wyoming Valley, PA Levee Project



- Agnes overtopping not a failure
- Remedial work not a failure
- Levee raising not a failure
 - Cost estimated to be \$145M was \$250M

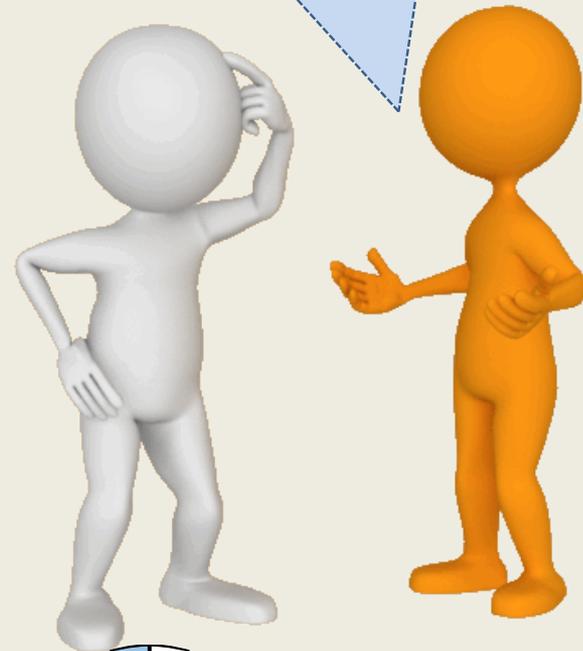
Continuous DM Under Uncertainty



It's the Same in Planning

- Using parametric costs
- Assuming no HTRW
- Per unit benefit estimates
- Using existing WQ data

Manage your risks. If something happens deal with it. The world is not ending.



Pay Attention to Uncertainty



**You Can't Make It
Go Away. Deal With It.**



Risk Informed Decision Making



- Assessors evaluate and convey the significance of uncertainty
- Managers take uncertainty explicitly into account in decision making



Now, we are being intentional in how we analyze and consider the effects of uncertainty.

Assessment Management



Risk and Planning

**Risk
Management**

**Risk
Communication**



Risk Averse

**Risk
Assessment**



Transition to Risk Management Not Easy



Food Safety CoP



Traditional Performance Criteria

Inspection

- Poultry cooked to minimum 165°F
- Shellfish from h for
- Who 140°F
- Milk pasteurized 15 sec
- Food safety criteria $A_w < 0.95$ & $pH < 5.5$ for Lm
- 5 log reduction of *E. coli* O157:H7 in juice

Whatever happens must be all right if you:

1. Follow the guidance.
2. Look for problems.



That Was Not Working

- Each year ~ 1 in 6 Americans get sick
 - 48,000,000 people
- 128,000 are hospitalized
- 3,000 die

CDC Home



Centers for Disease Control and Prevention

CDC 24/7: Saving Lives. Protecting People. Saving Money through Prevention.

A-Z Index [A](#) [B](#) [C](#) [D](#) [E](#) [F](#) [G](#) [H](#) [I](#) [J](#) [K](#) [L](#) [M](#) [N](#) [O](#) [P](#) [Q](#) [R](#) [S](#) [T](#) [U](#) [V](#) [W](#) [X](#) [Y](#) [Z](#) <#>

CDC Estimates of Foodborne Illness in the United States

CDC Estimates of Foodborne Illness in the United States

2011 Estimates of Foodborne Illness

2011 Methods

1999 Methods

Improvements in 2011 Estimates

Differences between 2011 and 1999 Estimates

Trends in Foodborne Illness

Questions and Answers

Resources

[CDC Estimates of Foodborne Illness in the United States](#)

CDC 2011 Estimates: Findings

CDC estimates that each year roughly 1 in 6 Americans (or 48 million people) gets sick, 128,000 are hospitalized, and 3,000 die of foodborne diseases.

Please visit the [CDC Online Newsroom](#) for the December 15, 2010 [media briefing](#), [transcript](#), and [press release](#); read our feature on [2011 Estimates of Foodborne illness in the United States](#); and also hear the [Emerging Infectious Diseases Podcast: New U.S. Foodborne Illness Estimates](#)



The Key

Risk Analysis

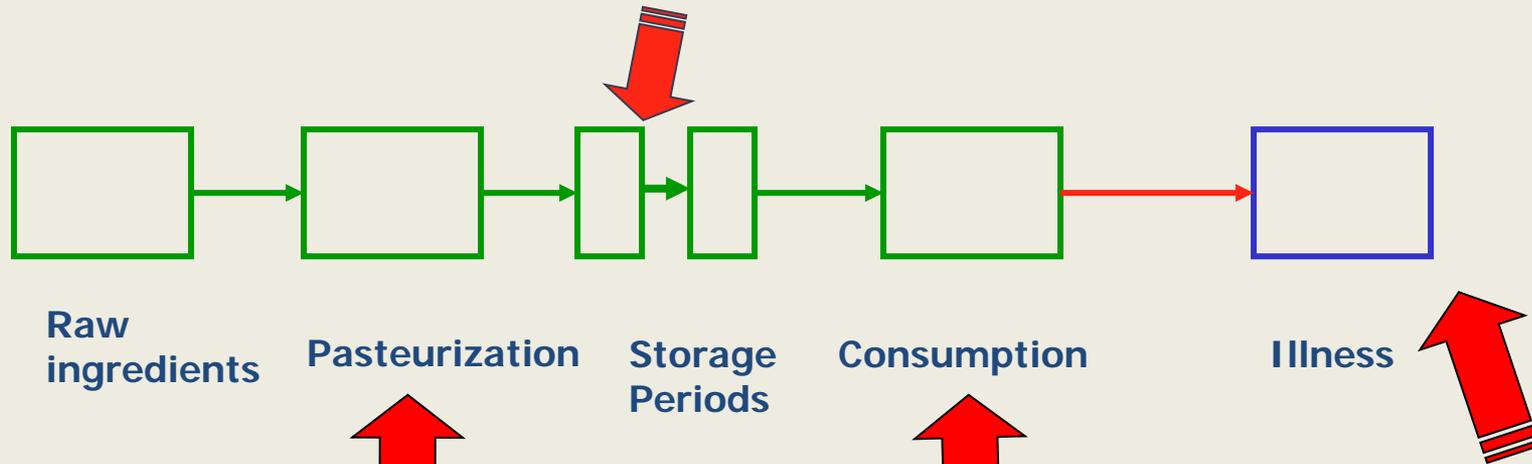


- Focus on desirable outcomes not rules
- Prevent problems don't solve them
- Free people to achieve outcomes

FSO: Freedom From Procedures



3. Microbiological criteria (est. by R. assessment)
(cfu/g)



4. Performance criteria
(logs inactivation)
Rather than process criteria

2. Food safety objective
(cfu/g)
Est. at pt. of consumption

1. Acceptable level of
protection
(cases/yr)



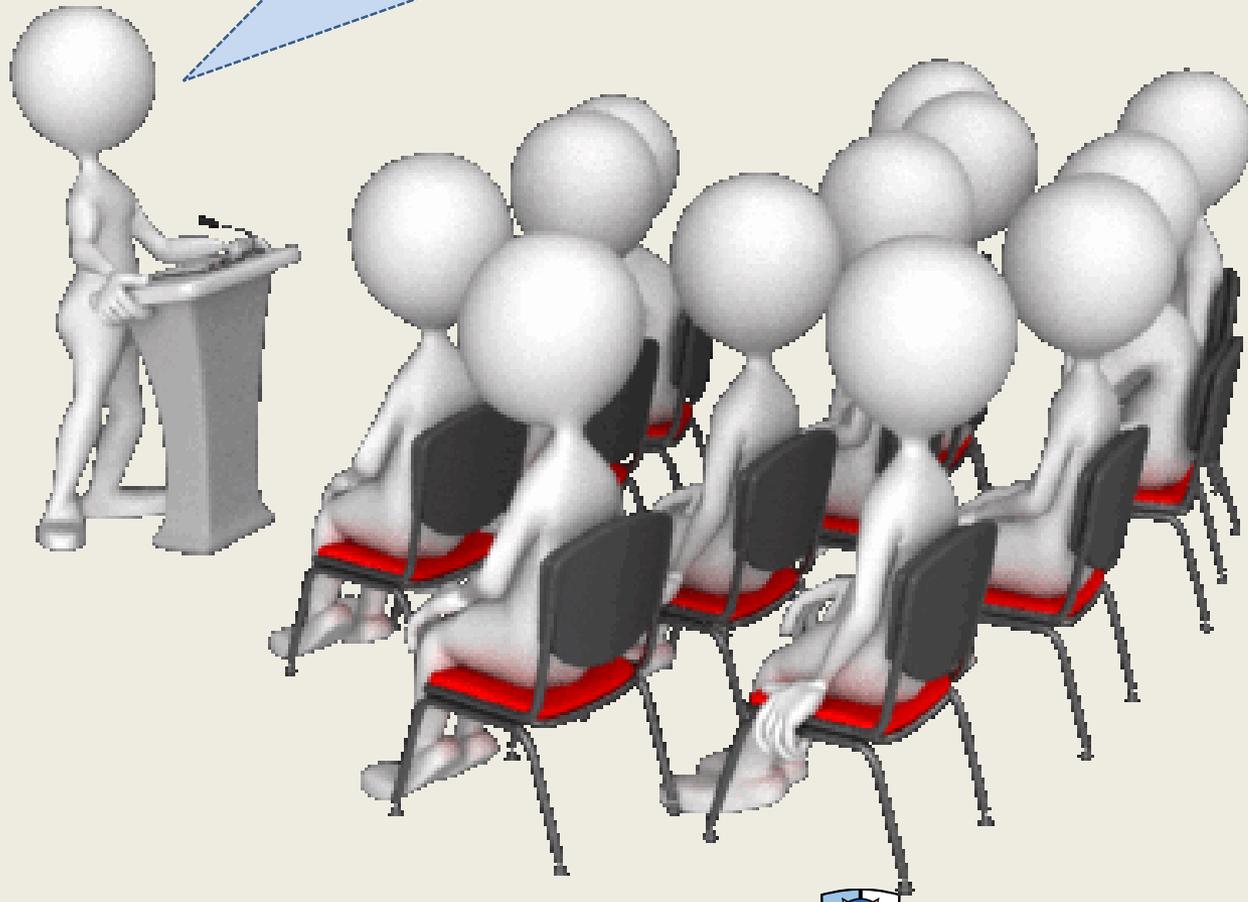
Agencies Struggle



- APHIS-wants pest risk management textbook
- FSIS-RM to get out in front of the process
- CFSAN-used failure and success stories to define RM process



Risk management is outcome oriented decision making and those decisions are made under uncertainty.



USACE's Traditional Performance Criteria



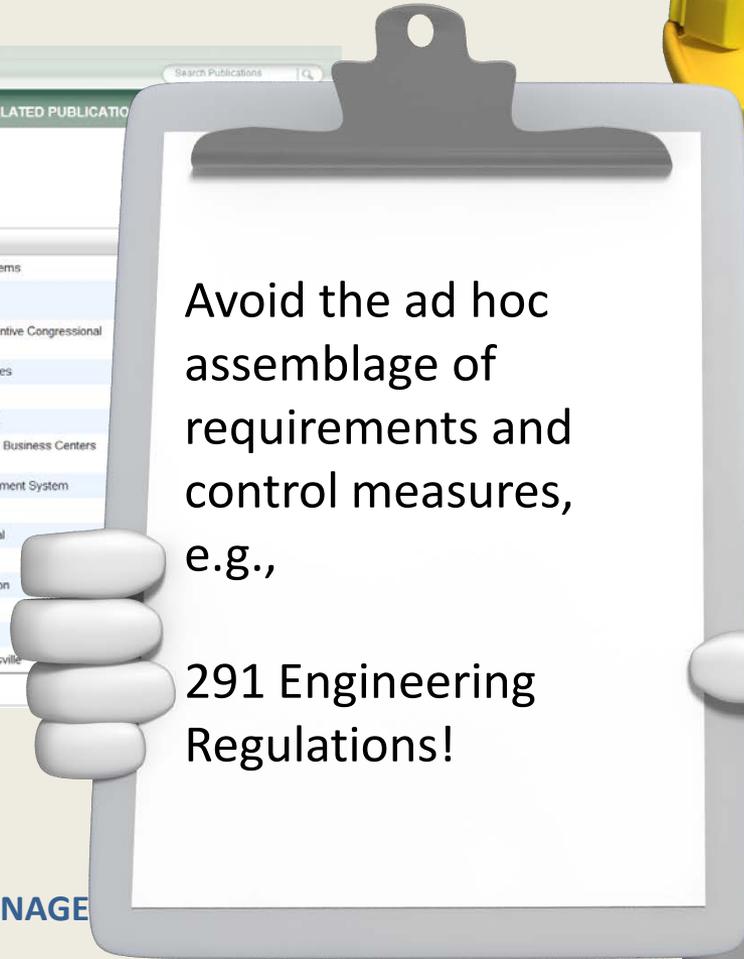
US Army Corps of Engineers

USACE PUBLICATIONS ARMY PUBLICATIONS RELATED PUBLICATIONS

ENGINEER REGULATIONS

Pub Number?	Proponent	Title
ER 1-1-11	CEMP-CE	Progress, Schedules, and Network Analysis Systems
ER 1-1-25	CERM-MP, DAEN-RMM-P	Command Visits
ER 1-2-2	CECW-PL	Water Resources Policies and Authorities Substantive Congressional Contacts (RCS: CECW-P-21)
ER 5-1-9	CERM-M	Assignment and Transfer of Project Responsibilities
ER 5-1-10	CECW-CE	Corps-wide Area of Work Responsibility
ER 5-1-11	CECW-CB	U.S. Army Corps of Engineers Business Process
ER 5-1-13	CERM-P	U.S. Army Corps of Engineers Policy on Regional Business Centers (RBCs)
ER 5-1-14	CERM	Resource Management - USACE Quality Management System
ER 5-1-15	CES-P	Strategic Management
ER 5-1-16	CEMP-CN	Management Capacity Development - International
ER 10-1-5	CERM-MO	Mississippi River Commission
ER 10-1-8	CERM-MO	U.S. Army Engineer Waterways Experiment Station
ER 10-1-11	CERM-OO	U.S. Army Engineer Housing Support Center
ER 10-1-16	CERM-O	U.S. Army Coastal Engineering Research Board
ER 10-1-22	CERM-M	U.S. Army Engineering and Support Center, Huntsville

Page 1 of 20



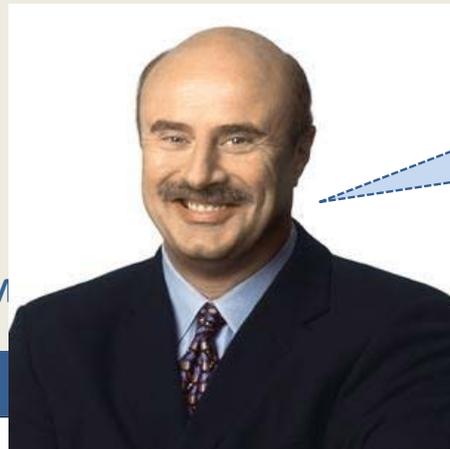
Avoid the ad hoc
assemblage of
requirements and
control measures,
e.g.,

291 Engineering
Regulations!

Outcomes



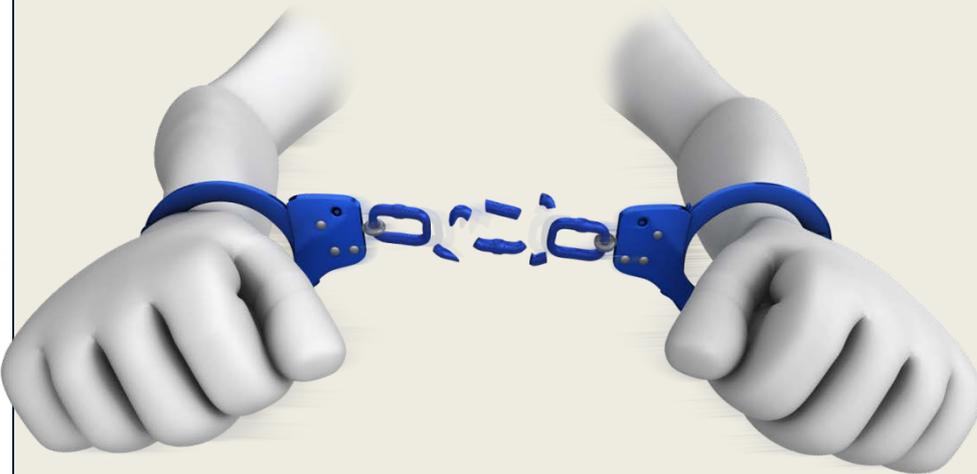
- Lives lost
- Flood damages
- Navigation disruptions
- Reallocation studies
- Dam Safety
- Levee Safety
- Dam removal
- CERP
- Ecosystem restoration
- Cost estimating
- Project-based budgeting
- ANS



How's that ER
management
working for ya?



Risk-Informed Planning



- Can set planners free!
 - Less guidance
 - More creativity
 - More innovation
 - Assume more risk
 - Better outcomes!



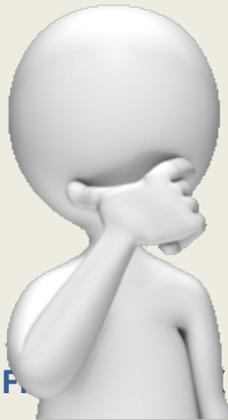
Risk Management

Traditional



- Objectives Focused
- Predictive Indicators
- Foresight
- Strategic
- Creates and captures value

- Event Focused
- Post-action Response
- After-thought
- Transactional
- Protects Value



Which best describes what you want to be?



RISK MANAGEMENT

- Protect life, health & safety
- Energize the economy
- Reduce risk from disasters



TRADITION

- Stay in your lane
- Follow the guidance
- Whatever happens must be okay



USACE Transition Challenge



To Risk Management



From Project Building

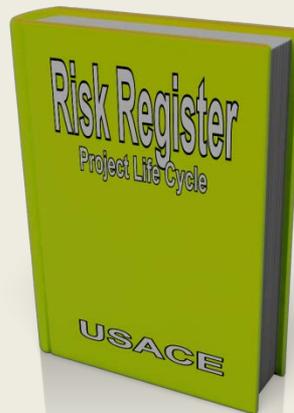
GRADUATE CERTIFICATE IN RISK MANAGEMENT



NOTRE DAME OF MARYLAND UNIVERSITY

Risk Management Agency

- The goal is to assume risk judiciously, mitigate it when possible, and prepare yourselves to respond effectively and efficiently when necessary





But what does it really mean?





You must both
take and avoid
risks!

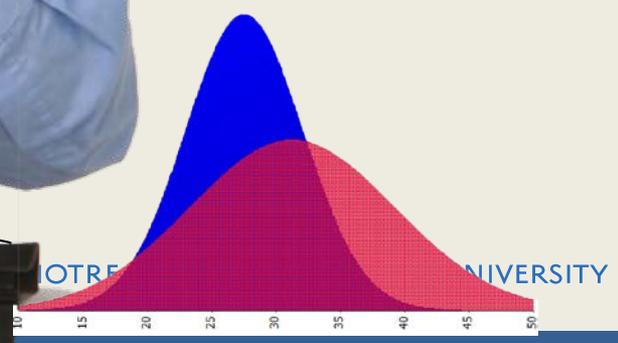
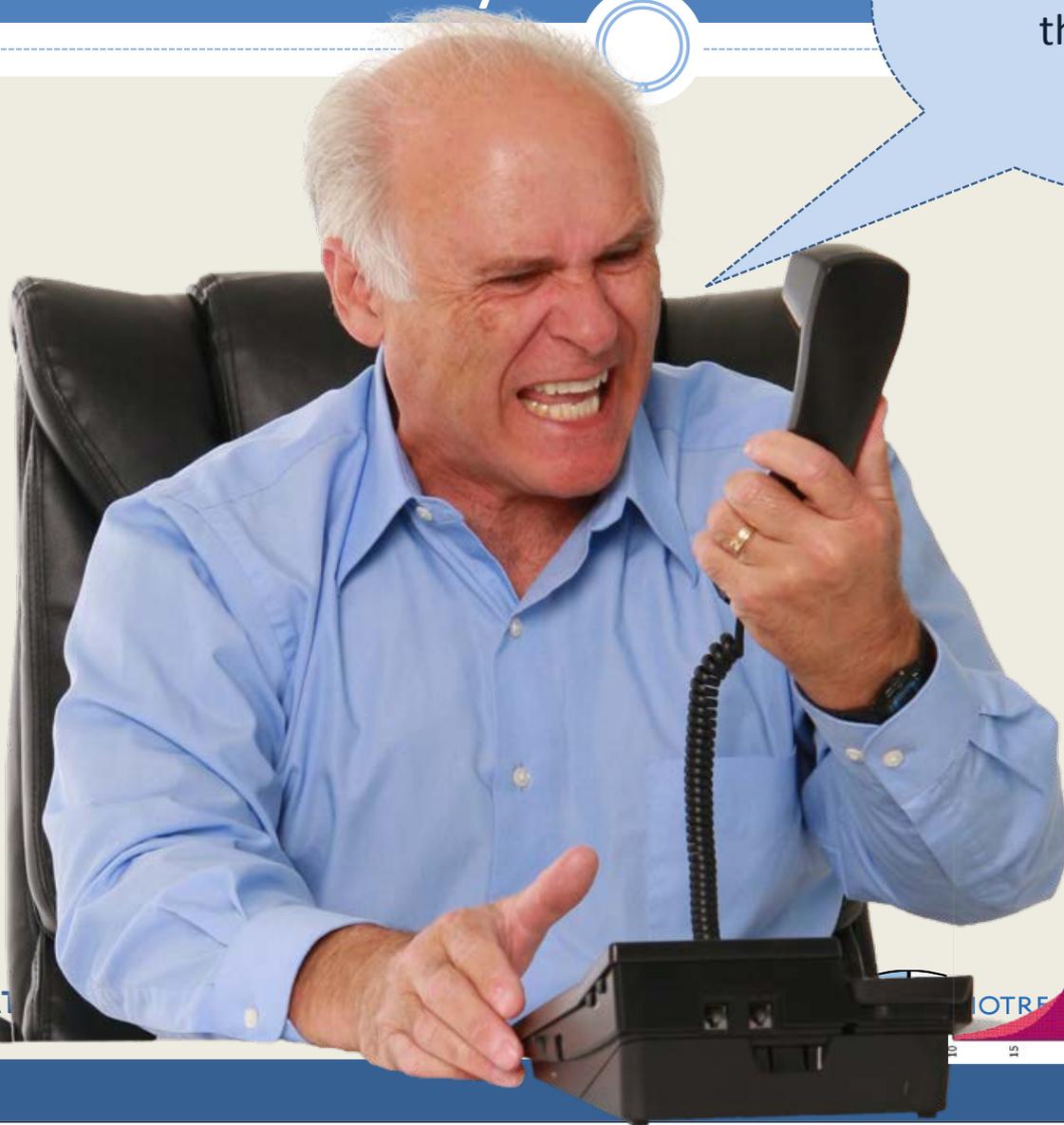


Decision
making
must
evolve.



Decision Making Under Uncertainty

Can't you just give me the damn number!



Poor boss, he does not understand. There is no such thing as the number. There is too much uncertainty.



We need to use all the good information we generated in our risk assessment to make risk-informed decisions.

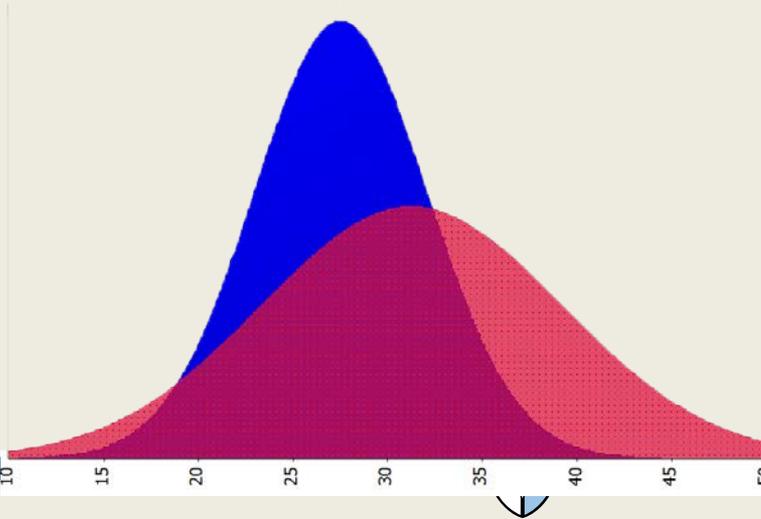
This is going to frustrate people for awhile.



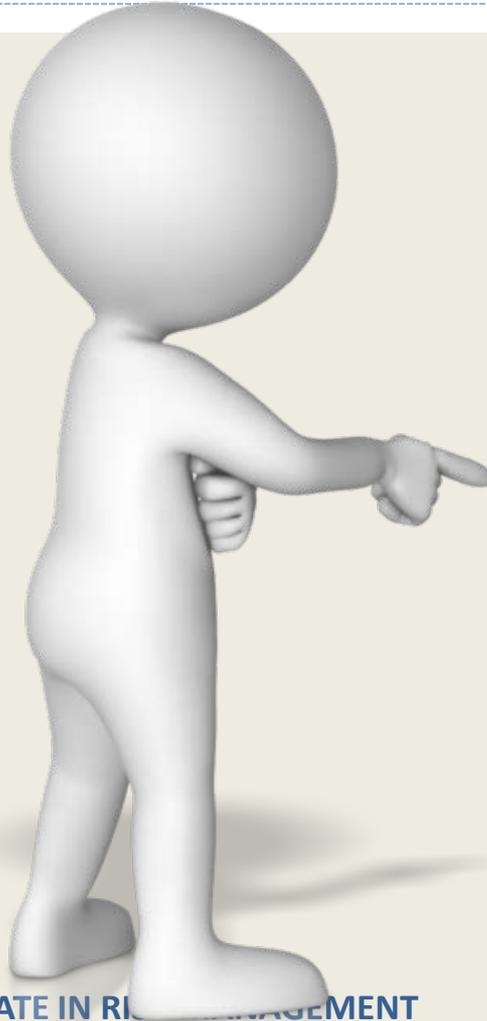
Help The Decision Maker



- Develop and use risk information to aid decisions made under uncertainty



New Risk Metrics



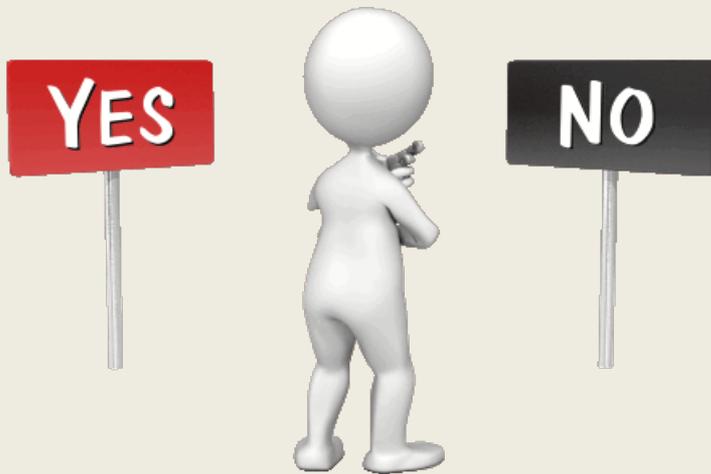
- Residual risk
- New risk
- Transformed risk
- Transferred risk
- New metrics
 - DSAC Class I - V
 - LSAC Class I - V
 - Partitioned risk



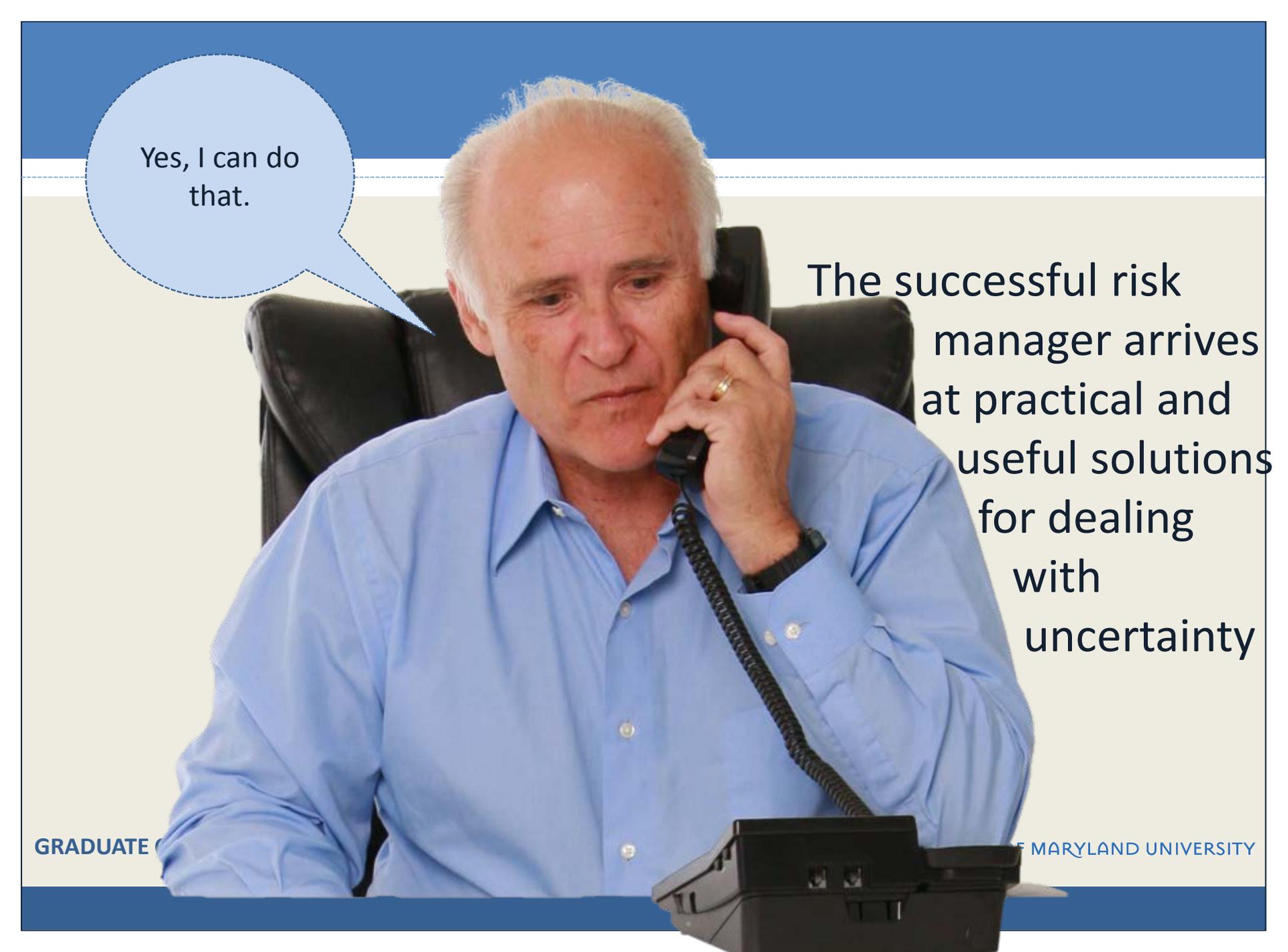
What am I supposed to
do with these new
metrics?



Make Decisions!



- How much detail is enough for now?
- What level of risk is tolerable?
- How will we manage risks to limit undesirable outcomes in planning studies?

A middle-aged man with white hair, wearing a light blue button-down shirt, is sitting in a black office chair and talking on a black telephone. He has a serious expression. A speech bubble above him contains the text "Yes, I can do that." The background is a light blue gradient.

Yes, I can do that.

The successful risk manager arrives at practical and useful solutions for dealing with uncertainty

Risk Narratives

- We need to tell vivid and honest stories
- Proclaim uncertainty
- How do we convey what a levee overtopping would mean?

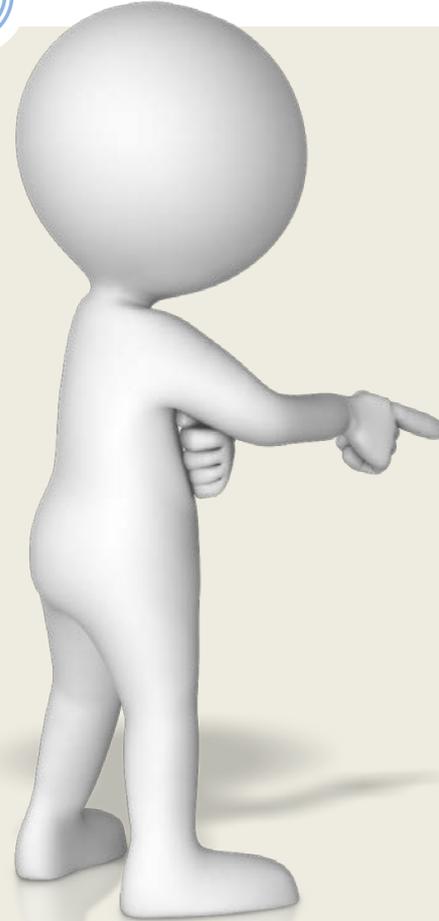


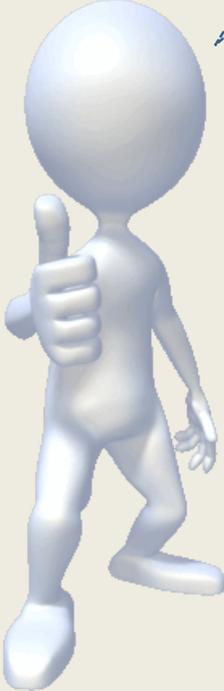


What do I do when there is a lot of uncertainty and we can't reduce it?



Live with it and
don't punish
responsible risk
taking.





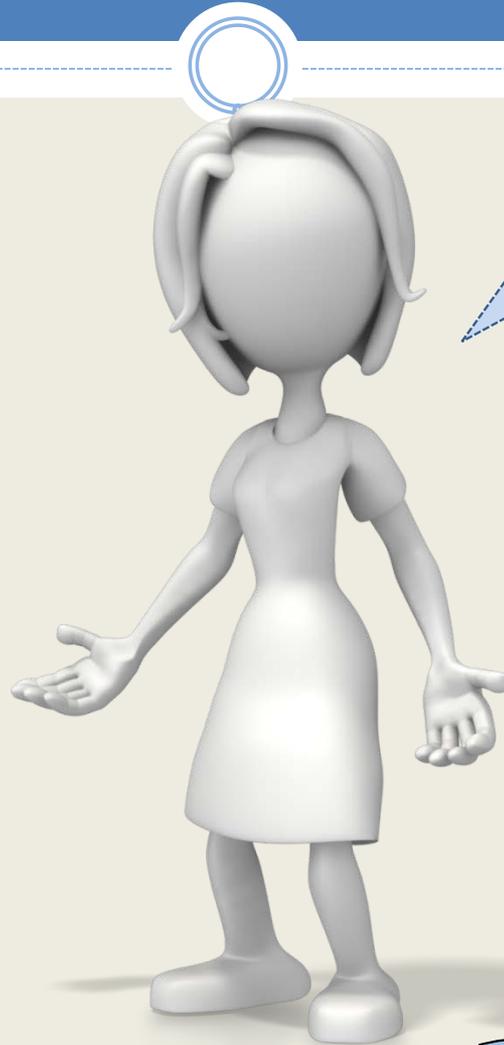
We'll learn
from it!



If you take risks
some of them
will turn out
poorly.



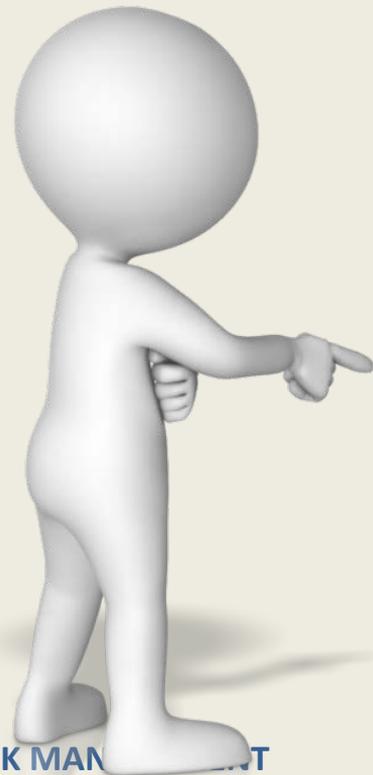
Let's
summarize.



Take Away 1



- Planning has changed so USACE should change the way it plans



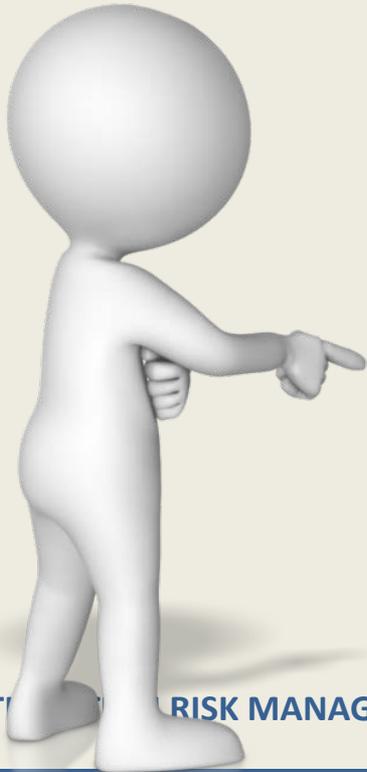
**Risk-informed
planning**



Take Away 2



- Uncertainty has always been there, it is time to deal with it



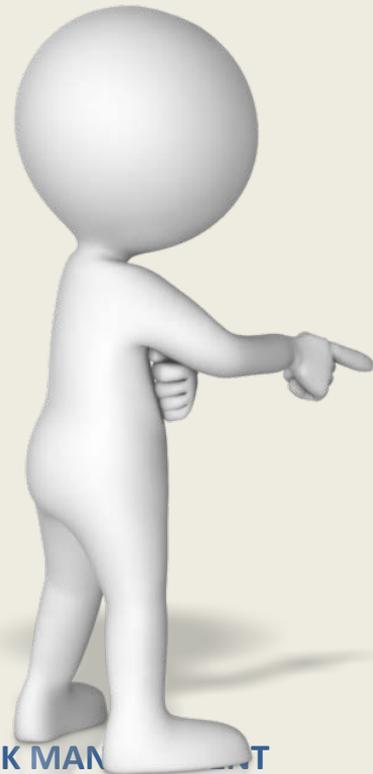
**Risk assessors and
risk managers must
both address uncertainty
in their work**



Take Away 3



- You are either doing risk management or you're doing something else



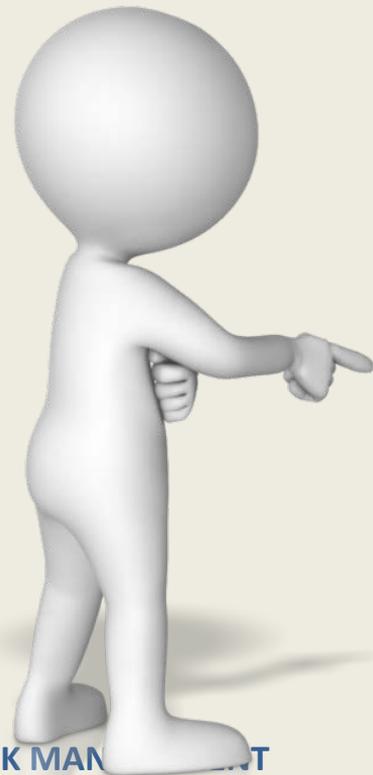
**Commit to strategic
risk management**



Take Away 4



- Risk managers balance risk taking and avoiding risk to achieve goals



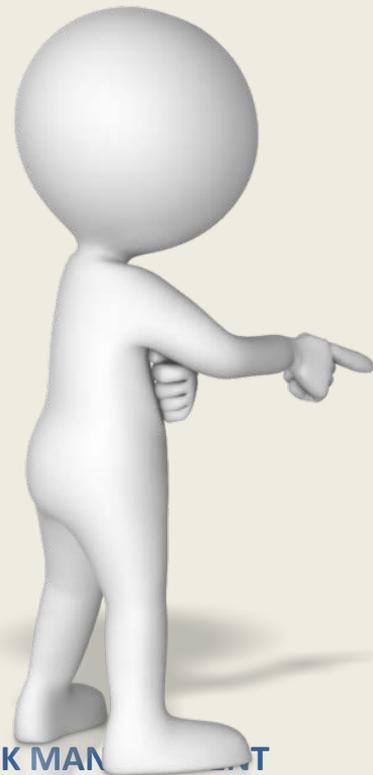
**You must take
some risks to move
forward**



Take Away 5



- The USACE has the opportunity to become the Nation's risk management leader



**Adopt an enterprise
risk management
model**



Thank you.



CHARLES YOE
NOTRE DAME OF MARYLAND UNIVERSITY

GRADUATE CERTIFICATE IN RISK MANAGEMENT



NOTRE DAME OF MARYLAND UNIVERSITY