

Planning Associates – Class of 2006

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Critical Think Piece: Improving Risk Communication

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Introduction

Communicating risk is one of the most challenging and critical aspects of the Corps of Engineers Civil Works mission. This is recently acknowledged in the Corps 12 Actions for Change that came after investigation into the Katrina disaster. “Points” 9 and 10 specifically address risk communication challenges. Some element of risk touches all Corps business lines. The Planning Guidance Notebook (ER 1105-2-100) discusses risk as an outcome with a known probability of occurrence and requires that all Corps water resources planning include a risk and uncertainty analysis. Risk communication also applies to other business lines such as military programs and environmental cleanup. Uncertainty comes into play for those areas where there is not enough information to be able to assign a probability to a given outcome.

The public view of risk varies widely. The perception of control, personal experience, if the risk is voluntary or imposed, and other factors influence the acceptance of a risk. Things such as home fires, drunk drivers, sex offenders, and home theft are generally viewed as high risk occurrences and individuals take actions to reduce their risk. Earthquakes and flooding are generally considered to be low risk occurrences. Even though individuals may express fear and concern over earthquake and flooding, they do not generally act to reduce their perceived risk.

Typically, the Corps does not invest time and money up front on communication. Usually communication is emphasized only in reaction to an event that has already occurred. A proactive approach is more effective than a reactive approach.

There are a number of factors that make risk communication difficult. The audience can lack interest, carry a preconceived idea of the risk, misunderstand probability, lack a frame of reference, or crave certainty before believing. Those delivering the message do not always use terminology that the target audience can understand. Messages and terminology need to be consistent among governmental agencies, especially FEMA and the Corps. Over simplification of the message can dilute its effectiveness.

Understanding Risk

Risk is defined in the dictionary as the possibility of suffering harm or loss. Risk communication requires understanding and feedback. Not only do decision makers need to understand how their audience perceives risk in order to communicate effectively, the audience needs to provide feedback. Only then is effective communication taking place. Without feedback there is no way to determine if the message conveyed was the message understood. By having a continuous flow of information, everyone is involved in the process; everyone is invested in the final decision.

Characterization of Risk

Risk applies to all aspects of water resources that the Corps Civil Works business lines address. There are risks to lives and property from flooding and hurricane storms. There are risks to the economy from these types of events, as well as from aging infrastructure and undersized navigation facilities. There are risks to quality of life across the business lines. The following table summarizes the types of risk across the Corps Civil Works business lines.

Business Line	Area of Risk			
	Life	Property	Economy	Quality of Life
Flood Damage Reduction	X	X	X	X
Hurricane Storm Damage Reduction	X	X	X	X
Deep Draft Navigation			X	X
Inland Navigation			X	X
Hydropower			X	X
Ecosystem Restoration				X
Water Supply			X	X
Recreation	X			X

Risk to Lives and Property

It is always a challenge to articulate risk to life and property from natural disasters in a way that makes a meaningful impact on the affected public. People across the nation live at risk from a variety of factors: flooding

Challenging Concepts to Communicate
The period of time between flood events of a certain magnitude, averaged over many thousands of years is the return frequency in years (Level of Protection for given alternative) .
The probability that the target stage will be exceeded in any year considering all potential floods is Annual Exceedance Probability . <i>Example: Statistical chance is 1 in 2, which corresponds to a 50% percent probability. Traditionally this has been called “2-year level of protection.”</i>
The probability that that the target stage will not be exceeded given a specific flood severity is Conditional Nonexceedance Probability .

from rivers, coastal processes, and storms. In many of these areas, risk has been reduced through construction of public works projects, often constructed by the Corps. But never do these projects eliminate risk. A residual risk remains associated with an event greater than the designed level of protection provided by the public works project. Flood damages continue to increase as the population flocks to coastal areas and floodplains in high-risk regions. Populations in these high-risk areas do not seem to grasp the reality of the risk from living in a

high-hazard zone. When disaster strikes, they look for government accountability and compensation.

The Corps has worked with the public in water resources development for decades. But in project development, risk and uncertainty are typically emphasized during problem identification, defining the future without project condition, and formulating alternatives. Residual risk has not traditionally been emphasized when characterizing the costs and benefits of alternative plans. While alternative plans reduce risk, they do not eliminate it. Nomenclature is a problem. The phrase “100-year flood event” is something few in the general public understand. The words are deeply entrenched in our national dialog and most commonly interpreted as the flood event that happens only once in 100 years. This is dramatically different from the actual meaning: that a flood of a certain magnitude has a one percent chance of occurring in any given year. The technical definitions developed by the Corps, while more accurate, are even harder for the general public to comprehend. Even within the Corps, few employees use the new jargon. When it is used in interviews with the media, reporters become confused and revert to “X-year level of protection”, which few understand but almost all use. How do we break the tradition to better communicate the realities of risk? Is “1% flood this or any year” easier to explain? Is it easier to understand?

In many cases, local public officials and land developers minimize flood risk and perpetuate the myth that public works projects are infallible. Land use planning is the last bastion of local jurisdiction, where development plans are approved, even encouraged. Federal and/or state governments regulate most other areas involving risk to the public. Local governments, eagerly seeking growth, make bad policy decisions often based on unsound public works strategies presented by developers. Short term economic growth should be balanced against the complete cost of a flood. Yet when disaster strikes, they hold state and Federal

governments responsible for failing to eradicate risk. An example of this is the Yuba City and Marysville area of California, north of Sacramento. An area called Plumas Lakes is a basin surrounded by levees. In 1997, a levee failure flooded the basin up to 15 feet deep. A recent court decision in California held that the state was liable for uncompensated real estate taking by “allowing” the levee to break and associated floodwater to be “stored” on private property without benefit of flowage easements. For the past few years, locals have been pushing to develop the rest of this basin. Their strategy to “protect” existing development from flooding again is to develop the rest of the basin and assess the new housing for improvements to the levees. But this assessment assumes a Federal response in case of levee failure. That Federal cost is not included in the assessment.

Aging infrastructure at Corps lake projects is requiring more funds be diverted from recreation management to repairing structures. Aging infrastructure poses a safety risk to recreational users beyond the voluntary risk linked to water based recreational activities. This is something that is not communicated to the public. These existing projects are not subjected to a NEPA public review process when resources are diverted away from recreational management and safety. Many Corps projects have recreational components. Water based recreation involves risk to life, although not risk related to project failure. Corps lakes have active safety programs to educate the public regarding safe use of the recreational facilities available at Corps projects. These programs effectively communicate recreation-related risks to the public thereby reducing the risk through awareness. It is important that as budgets remain flat or are cut that this important program not be adversely affected.

Risk to the Economy

There is a vast transportation network the Corps has helped to create in the harbors and inland waterways of the United States. This infrastructure is aging and associated costs of operation are increasing. Many of the nation's locks and dams are 50 to 100 years old. Maintenance costs are increasing but the Corps budget for these items remains flat. The public is not usually aware of the risks associated with failures on the nation's navigation systems. Navigation features such as channels and breakwaters generally experience longer duration failures such as silting of channels. Longer duration events cause degradation of performance but not usually catastrophic failure. Locks can experience immediate failures such as mechanical breakdown, but generally there is no associated risk to life and health. However, there can be large impacts to the economy from delivery delays and spoilage of products when navigation projects are not operating, particularly when cargo is high value and time sensitive.

Corps constructed hydropower plants are in the same situation as the locks and dams. They are aging and many need major rehabilitation. The public is not generally aware of risks associated with failures of hydropower plants. The most likely risk is from hydropower units dropping off line during peak demand in periods of extreme weather, hot or cold periods, and leading to blackout events. As hydropower plants continue to age, risk of failure increases. Considering the current shortage of energy sources, it is likely the risk of blackouts tied to loss of hydropower will become more critical in the near future.

Water supply is not a high priority mission for the Corps, and the Corps does not build or operate single purpose water supply projects. Water supply storage does not guarantee water supply in the event of a long term drought. Communities depending on water supply from Corps lakes must realize there is a risk they will not have the water that they need.

Reallocation studies present some risk because storage for floodwater may be changed to water supply. Flood damage reduction for the downstream area may be reduced. The studies must present the risk from drought, catastrophic flood events, and resulting environmental impacts from increasing water supply storage.

Other Types of Risk

The main source of risk (uncertainty) associated with ecosystem restoration projects is the projects may not perform as planned and, at worst, may cause more degradation to the environment. There is not enough data on these types of projects for predicting if they will perform as planned. We cannot even say, “This project has an X% risk of not producing the planned outputs”. Corps planning guidance does not address how to communicate this risk without losing the confidence of the public.

Why the Corps Needs to Improve Risk Communication

The nation has experienced a number of natural disasters in the past few years, primarily loss of lives and property from hurricanes and related flooding. Development continues in coastal areas and in deep floodplains, despite such disasters as New Orleans. At the same time projects that are funded to provide protection perpetuate a false sense of security without public understanding of the true risk. Individuals need to understand risk so that they can make informed decisions. Further, if the public can be more aware of projects that they do not typically take a strong interest in, such as inland navigation projects, they may be instrumental in elevating the risk of aging and undersized infrastructure to a national dialog.

Effectively communicating risk to the public requires a shift in the Corps outlook. Many senior personnel of the Corps still refer to flood damage reduction as flood control. This situation exists despite work done by IWR on risk communication published as IWR Report 93-

R-13. If we can not make this change internally, how are we to communicate to the public at large?

How Can We Communicate More Effectively?

It is possible to improve risk communication. In some regions, Corps of Engineer Districts have consistently and firmly been explaining the risk of the “1% chance of flooding in any given year” to the media. In recent months news articles in Sacramento have begun to print this revised characterization of flood risk. Some newspapers now also report risk of flooding as “having a 26% chance of occurring during the 30 year life of a home mortgage”.

The following are suggested ways to improve risk communication. Indicated for each is the area of responsibility proposed for implementation.

1. Corps Risk Communication Plan. Develop a plan to use Corps wide on communicating risk.

- Task Force. Scope a task force of Corps and strategic partners to develop communication strategies regarding risks associated with Corps projects. Build from existing work on risk communication. (HQUSACE).
- Focus Groups. Listening to the public as well as informing will be needed as part of a risk communication plan. Use of focus groups to understand how the public views risk associated with Corps projects. Focus groups could also help in developing communication strategies for subpopulations, such as the elderly and immigrants. (HQUSACE and Corps Centers of Expertise.)
- Education Strategies. Research results indicate that trying to educate the public without understanding how they perceive risk is not effective. Additionally misuse of terminology and use of multiple terms for the same concepts contributes to public

confusion of risk. Training for government personnel including PAO personnel (because they develop communication briefing material for others) in use of correct terminology along with media education could help with public understanding of risk. For example incoming Division and District commanders could receive training on risk communication strategies and pitfalls. (USACE PAO)

- Emulate Success. Use the Corps' recreational water safety program, which makes a difference each year in reducing risk through effective communication to the public, as a model for communicating risk. We cannot afford to cut the funds that support these types of programs. (Corps Center of Expertise.)
- Budget Guidance. Effective communication takes time and money. The Corps has manuals on risk communication, but they are not widely known or used by Corps staff. Make effective communication of risk a budgetary priority. This could involve developing ranking criteria based on development and implementation on effective risk communication plans as part of every Corps project. (HQUSACE, ASA (CW), OMB.)
- Reduce Risk Through Learning. Risk associated with ecosystem restoration projects can be reduced over time as projects are implemented and monitored. Adaptive management can mitigate some degree of risk of failure. Programmatically, the Corps, working as a learning organization, could learn from After Action Reports conducted sometime after construction to allow for an expansion of lessons learned. These findings could be made available to all so other projects could benefit from the lessons learned. This effort requires funding after construction. (USACE and/or IWR.)
- Improve the Planning Process. Planners need to learn from actual flood events to paint a compelling description that helps the public understand risk. This should be communicated in all project public workshops and in associated decision documents.

Utilize footage and pictures from actual situations (such as the New Orleans flood).
(Districts.)

2. **New Ways to Characterize and Communicate Risk.**

- Partner with the Media. While the Corps crafts agency messages, the media delivers them. The media understands how to capture public attention. Work with the media to examine out-dated nomenclature and develop a plan to migrate to current, more effective terminology. Also, consider broadcasting educational television campaigns on local stations. (HQUSACE PAO with Corps Centers of Expertise.)
- Focus Groups. Focus groups may provide insight on more effective ways to characterize risk so it is better understood and heard by the public. They can work to find words the public understands and develop more meaningful examples to communicate risk and uncertainty in user-friendly language. Current examples in use are related to the life of a mortgage and gambling. A non-Corps perspective is particularly needed. ‘X-% risk flood’ is not understood by the general public. We need better ways to describe the benefits of Corps projects. We also need better ways to describe the uncertainty that these benefits will be achieved. (HQUSACE, Corps Centers of Expertise and National Nonstructural Flood Proofing Committee.)
- Partner with Project Proponents. Develop risk communication strategies with non-Federal partners, particularly those not having a vested interest in growth. Present a strong, unified and consistent message when speaking with the media and public. (Corps Districts.)
- Develop Compelling Visual Aides. Tools such as the physical flood models owned by Tulsa and Sacramento Districts are a good way to show how flood protection works and how it can be affected by outside factors. These models are small enough to be taken on

the road for state fairs and public workshops. Each region could have portable physical models that can be mobilized and featured at various forums keeping risk high in the public's mind. (Corps Centers of Expertise.)

- Interactive Website. Create an interactive website which the public can access and use as a learning tool. (Corps IWR)

3. National Partnerships.

- National Risk Communication Policy. Work with FEMA and other Federal agencies to develop a consistent Federal policy regarding risk communication. This should be tied in with the ongoing National Flood Risk Management Initiative. (Corps IWR.)
- Silver Jackets. Continue expanding Silver Jackets to work with other agencies in developing better communication and education strategies. (Corps IWR and States with Centers of Expertise.)
- Memorandums of Agreement. Develop new and modify existing Memorandums of Understanding and Agreement with key partners to address risk communication. (HQUSACE and agency/NGO heads).
- Building Codes. Building codes for flood risk areas, similar to earthquake and fire building codes, should be required for construction in flood risk areas. These could be developed and incorporated into national flood insurance policy requirements. (HQUSACE and FEMA.)
- Improve Land Use Planning Relationships. Build ongoing relationships with land use planners and attend regular meetings with county planners and local supervisors. This could be incorporated into project management plans as part of studies, design and construction phases. (Corps Districts.)

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