PLANNING QUICK TAKES: TIMELY TOPICS FOR RISK-INFORMED PLANNING STUDIES

Leigh Skaggs, MVP
Karen Miller, LRH
Kendall Zaborowski, DSMMCX
Ariane Pinson, SPA, CPR CoP Co-Lead
Dena Abou, LRD
Zack Hartley, LRC

Date: 15 July 2021

US Army Corps of Engineers®

PRESENTATION OUTLINE

- Background & Update on Planning Mentor Program - Karen
- “Planning Quick Takes” Overview: Purpose, Audience, Format, Previous Topics (#1-9) - Leigh
- New Topics
  - #10 Life Safety Analysis - Kendall
  - #11 Climate Change Analysis - Ariane
  - #12 Incorporating the 4 P&G Accounts – Dena & Zack
- Questions - All

BACKGROUND ON PLANNING MENTOR PROGRAM

DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS
441 G STREET, NW
WASHINGTON, D.C. 20314-1000

CECW-ZB

JUN 2 1 2017

MEMORANDUM FOR MAJOR SUBORDINATE COMMANDS, AND DISTRICTS

SUBJECT: Further Advancing Project Delivery Efficiency and Effectiveness of USACE Civil Works

1. Beginning 1 July 2017, this office will embark on a comprehensive organizational review of current authorities, policies, regulations, and procedures. The desired outcome is to identify opportunities for enhanced project delivery and increased organizational efficiency and effectiveness by reducing redundancies and delegating authority for decision making to the most practical and appropriate level. As a world class organization, we are committed to reliably delivering the best quality projects and services on time, and within budget. To do so, we must fully implement our Project Management doctrine, recognize risk and uncertainties, and develop mitigation strategies that allow us to accept appropriate levels of risk to improve project delivery. As part of the Civil Works strategy, I intend to operationalize risk-informed decision making at all levels in the organization, and then I expect discipline in documenting these decisions at the appropriate level. The following five paragraphs capture the key lines of effort that I expect us all to advance.

2. **Embrace and Operationalize Risk-Informed Decision Making**. We must change our behavior regarding risk management across Civil Works and in our policies, analytical approaches and models, priorities, and dialogue with sponsors and communities. Civil Works will undertake the following steps to develop a more comprehensive understanding and application of risk-informed decision making and project delivery across the agency:

a. Publish an Engineer Circular entitled *USACE Risk Framework*. This document will establish common principles for assessing, managing, and communicating risk. It will articulate principles and practices that ensure the consideration and application of risk and uncertainty to Civil Works activities and decisions;

b. Require functional areas and programs to develop risk-informed decision making processes for key decisions; and

c. Require all levels of the organization to embrace risk-informed decision making as a key component of project delivery in our day-to-day business in Civil Works. To support these efforts, Civil Works will undertake the following activities:

DIRECTOR'S POLICY MEMORANDUM
CIVIL WORKS PROGRAMS

US Army Corps of Engineers

No. DPM CW 2018-05 **Issuing Office:** CECW **Issued:** 03 May 2018 **Expires:** Indefinite

SUBJECT: Improving Efficiency and Effectiveness in USACE Civil Works Project Delivery (Planning Phase and Planning Activities)

CATEGORY: Directive and Policy

1. **Purpose**. This Memorandum covers the actions that must be taken within the planning phase of the USACE Civil Works project delivery process in order to embrace and operationalize risk informed decision making to make initial project delivery processes, as well as the full project lifecycle processes, more efficient and effective.

2. **Applicability**. This Memorandum is applicable to all Headquarters USACE (HQUSACE) elements, Divisions, Districts, laboratories, and field operating activities related to USACE Civil Works projects. The actions and policies in this memorandum will also be applied in the execution of studies funded by the 2018 Disaster Relief supplemental appropriations (P.L. 115-123).

3. **Direction**. Effective immediately, as part of USACE Enterprise Risk Management, we will incorporate risk informed decision making in project development. This policy acknowledges risk management is paramount to all USACE activities and requires transparency and collaboration with our sponsors and internal and external stakeholders. My intent is to provide quality products while accepting appropriate levels of risk in order to improve project delivery timeliness and cost effectiveness. Enterprise Risk Management explicitly assesses and manages risk, improving timeliness of our project development and delivery process by focusing on the most critical analyses, acknowledging uncertainty of decisions, and providing consistent visibility of common risk elements for decisions during the entire lifecycle of any project.

4. **Implementation**. Risk informed decision making in the planning phase is a shared responsibility. It is mandatory that all USACE elements involved in the Civil Works planning process and planning activities be responsive to this direction and put guidelines in place to support Civil Works project delivery. Not later than 90 days from the date of this memo, and through collaboration of its Planning, Engineering and Construction, Operations, Programs, Project Management, Real Estate, and Counsel organizations, HQUSACE will develop an implementation plan for operationalizing risk informed decision making during project development and lifecycle management to include developing interim guidance and updating permanent guidance, workforce training, etc.

5. **Risk Informed Planning**. The approaches and techniques described in the Planning Manual Part II: Risk Informed Planning (IWR 2017R03) provide project delivery teams (PDTs) with tools to efficiently reduce uncertainty by gathering only the evidence needed to make the next

SemoNOTE

A MESSAGE FROM LTG SEMONITE

11 May 2020

ERM

RIDM

ROLE OF PLANNING MENTORS

- Coach and mentor Planners/PDTs
- Early involvement in planning charettes and rapid iterations
- Helping teams employ methodologies from the **Planning Manual Part II: Risk Informed Planning**
- Share lessons learned and promote continuous improvement within the PCoP

UPDATES TO THE PLANNING MENTOR PROGRAM

- Added new mentors to available pool
- Fulfilled requests from Districts/MSCs for specific studies based on required skills or experience beneficial to the PDT
- Performed an assessment of the overall program with recommendations that are currently under consideration

PLANNING QUICK TAKES OVERVIEW

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- Originally titled “Planning Mentor Handbook”
- Version 1.0 posted to Planning Community Toolbox in June 2020
- Version 2.0 re-branded as “Planning Quick Takes” to connote applicability to all CW planners, not just mentors
- “Living document” (future topics planned). Possibilities:

  - *Requirements for Tribal engagement*
  - *Non-structural considerations (including aggregation method)*
  - *Natural and nature-based features*
  - *Risk-informed design for studies*
  - *Incremental economic analysis*
  - *Mitigation planning*
  - *Monitoring and Adaptive Management*

PLANNING QUICK TAKES: PURPOSE, AUDIENCE, AND FORMAT

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- **PURPOSE**: To serve as a high-level, “Quick Introduction” to many risk-informed planning tools and topics, plus links to additional resources (examples, POCs, and more detail)
- **AUDIENCE:** To be used by any planner to assist with RIDM (especially during early 6-step iterations)
- **FORMAT:** Each topic covered has:
  - the meaning of the concept, tool, or technique and its utility to/ for a feasibility study *(why should we do this?)*
  - who on the PDT develops it and when?
  - real examples from USACE feasibility studies w/ references to slide decks/reports for more detail
  - a summary of how it can be used in various settings or applications

"PLANNING QUICK TAKES" AUTHORS

- Version 2.0:
  - *Kendall Zaborowski, DSMMCX*
  - *Nick Applegate, OWPR*
  - *Ariane Pinson, SPA, Acting CPR CoP Co-Lead*
  - *Dena Abou, LRD*
  - *Zack Hartley, LRC*
- Version 1.0:
  - *Leigh Skaggs, MVP*
  - *Tim Fleeger, NWD*
  - *Andy MacInnes, MVN*
  - *Karen Miller, LRH*
  - *Pat O'Donnell, OWPR*
  - *Valerie Ringold, NWP*
  - *Brad Thompson, NWO*

PREVIOUS TOPICS

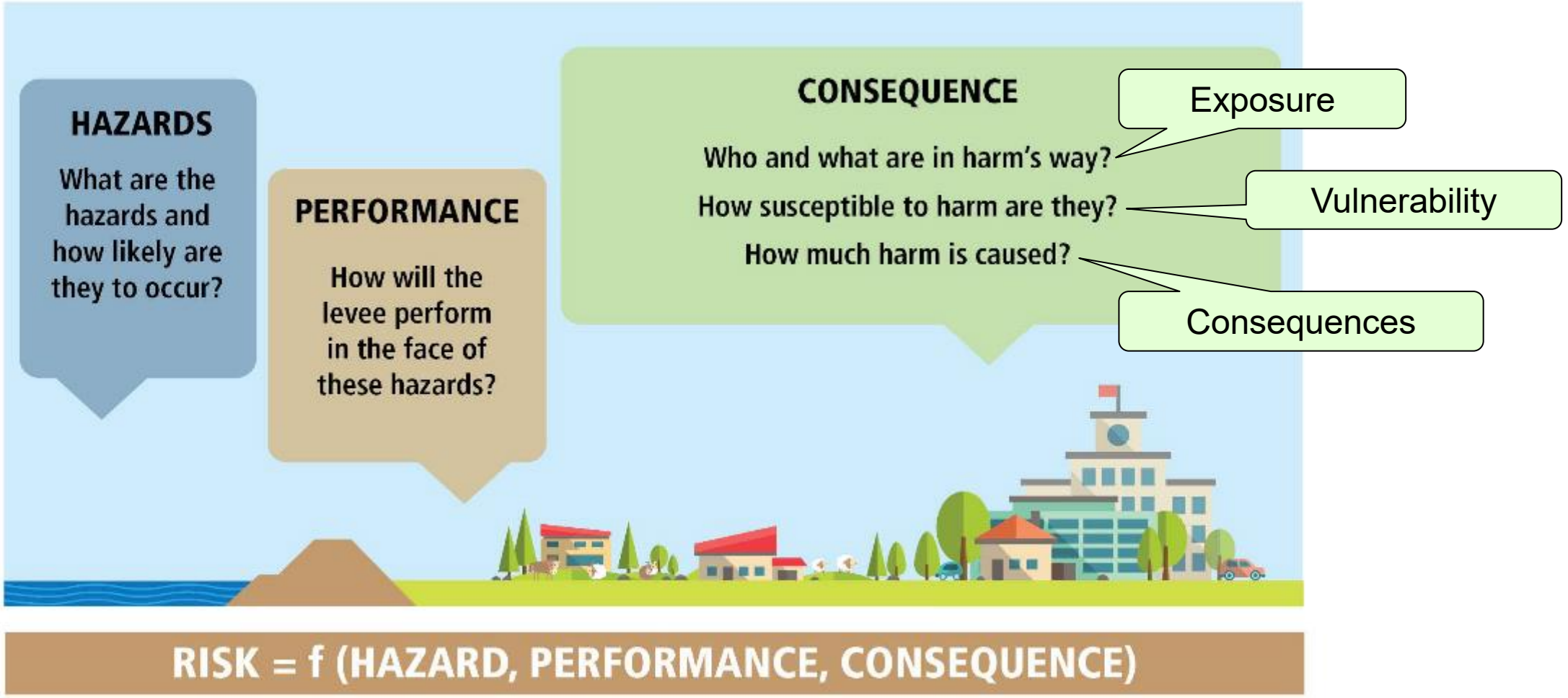
1. Six Pieces of Paper
2. Charettes
3. Engagement Techniques
4. Rapid Iterations
5. Plan Formulation Strategies
6. Screening Techniques & Decision Criteria
7. Level of Detail
8. Examples of RIDM for Different Business Lines
9. TSP Risk Assessment

TOPIC #10: LIFE RISK ASSESSMENT

1. What is it?

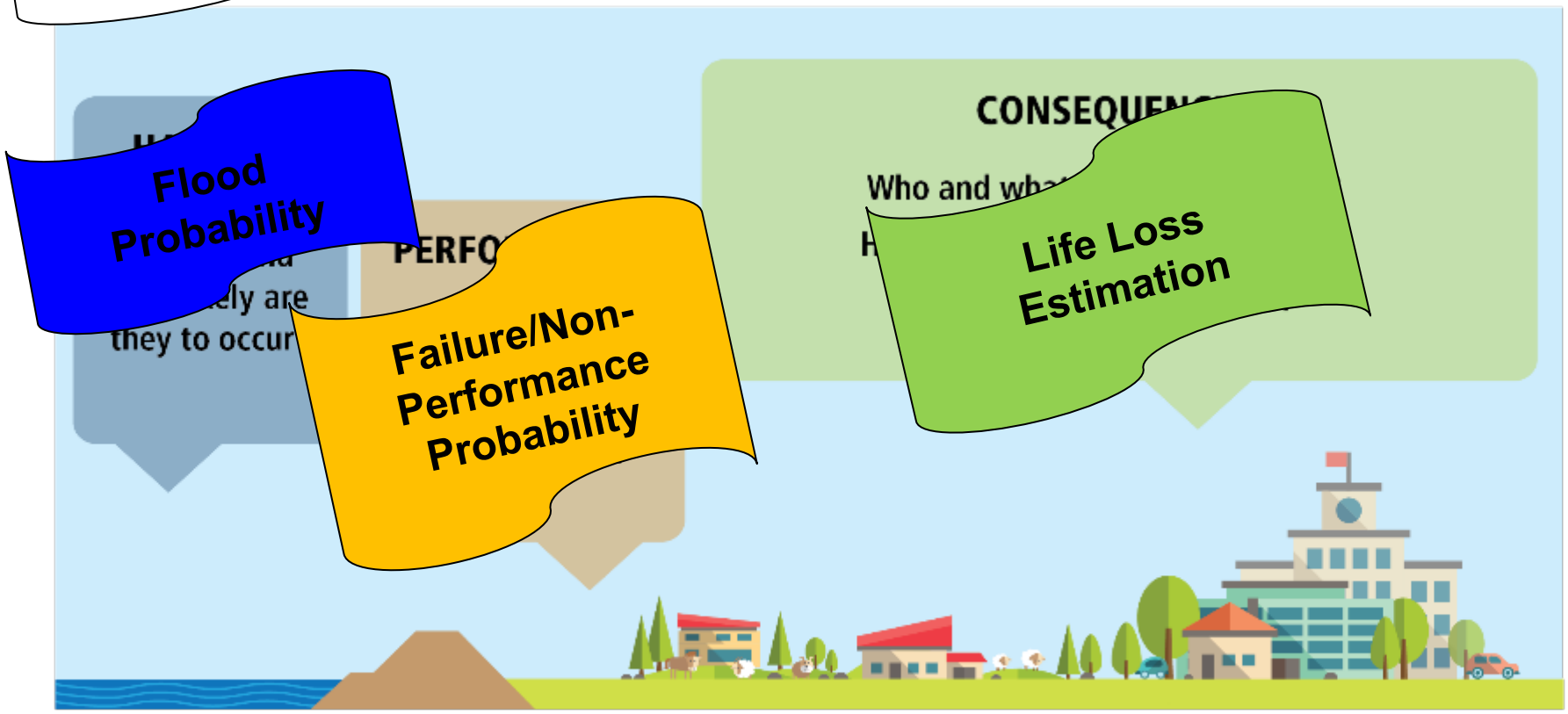
2. Who does it & when does it get done?

THE FLOOD RISK EQUATION



LIFE SAFETY
RISK ASSESSMENT

FLOOD RISK FRAMEWORK



RISK = f (HAZARD, PERFORMANCE, CONSEQUENCE)

RESIDUAL RISK VS. INCREMENTAL RISK VS. NON-BREACH RISK

Residual Risk (aka "Flood Risk") – The risk at any point in time (incl. incremental and non-breach). There are no "targets" to meet for residual risk. Just try to do some good! Consider as other non-monetary benefits for formulation, evaluation and comparison.

Incremental Risk – Risk to the floodplain/downstream occupants that can be attributed to the presence of the levee or dam. Difference between Breach and non-breach risk. Have predetermined agency guidelines that any USACE structure should meet, known as the "Tolerable Risk Guidelines (TRGs)."

Non-breach Risk – The risk in the floodplain/downstream area even if the levee or dam functions as intended

TOLERABLE RISK GUIDELINES (PER PB 2019-04)

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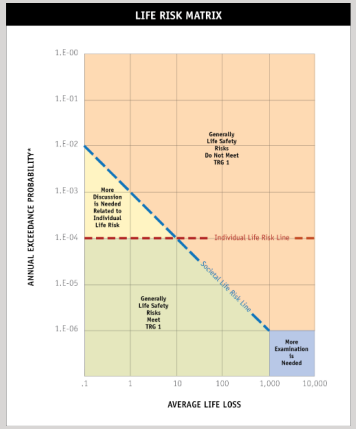
TRG	Description	Evaluation Method
1	Understanding the Risk	 Evaluation of Societal Life Risk Evaluation of Individual Life Risk Evaluation of Economic Risk Evaluation of Environmental Risk
2	Building Risk Awareness	will be determined qualitatively
3	Fulfilling Daily Responsibilities	determined qualitatively
4	Actions to Reduce Risk	(1) Have appropriate actions been taken to reduce risks? (2) Could any action reasonably be taken that would reduce risks further? (3) What is the cost to reduce the risk and how much is the risk reduced? (4) Should action be evaluated in a detailed study? (5) Is there demonstrated progress towards implementing risk reduction measures?

WHO DOES IT AND WHEN?

- Any life risk analysis is a true team effort and will require input from planners, engineers and economists.
- As the complexity of the life risk analysis increases, as dictated by the influence of life risk on decision making, the responsibility and timing of the development of the analysis shifts.
- More complex analysis should be managed by personnel trained in developing and facilitating life risk assessments.
  - You must involve your LSPM / DSPM, LSO / DSO, and the RMC early in your study!
- Qualitative and lower-level detail analysis can and should be used early in the planning process and to support decisions that are not influenced by life risk (see "*Tips for Conducting Life Risk Assessments in the 1st 90 days of an FRM Study").*

FOR MORE INFORMATION

FRM-PCX Webinar 6: Incorporating Life Safety in FRM Planning Studies:
https://planning.erdc.dren.mil/toolbox/resources.cfm?Id=0&WId=491&Option=Planning%20Webinars

FRM-PCX Webinar 7: Life Safety Risk Assessments in FRM Planning Studies:
https://planning.erdc.dren.mil/toolbox/resources.cfm?Id=0&WId=491&Option=Planning%20Webinars

Tips for Conducting Life Risk Assessments in the 1st 90 days of an FRM Study. Note that this document is DRAFT and is not meant to serve as formal requirements or guidance. This is solely meant as a resource giving PDT's helpful tips in scoping and conducting their life risk assessments.
https://cops.usace.army.mil/sites/PLAN/pcx/FRMPCX/Workspace/Shared%20Documents/Life%20Safety%20in%20Planning%20Implementation%20Team/Tools/01_FCSA%20to%20AMM/Tips%20for%20Life%20Risk%20Assessments%20in%20the%201st%2090%20days_v3_6-1-20.pdf

TOPIC #11: CLIMATE CHANGE ASSESSMENT

1. An evaluation of how the performance of a project alternative may change over the project's life cycle due to reasonably foreseeable changes to climate and hydrology in the project area.
2. Developed by PDT member with required training and experience.
3. Developed early in the planning process so that it informs the identification, evaluation and selection of measures, and, therefore, the choice of TSP.
4. Focuses on **relevant climate factors**.
5. Uses tools available online at: https://maps.crrel.usace.army.mil/projects/rcc/portal.html

CLIMATE CHANGE: RELEVANT FACTORS

- What causes the problem your project is attempting to address?
- Does the cause vary by season?
  - Is spring flooding a response to the same climate events that produce fall floods?
- Why do we care?
  - Climate change will affect each climate event type uniquely within a region
  - Change rates and magnitude vary by season, process and location
  - Changes are affected by interactions with changes in other parts of the world
    - E.g., Arctic warming affects fall temperatures in the U.S.
    - E.g., Changes in the Pacific affect ENSO conditions

Focus the assessment on the climate events/factors that cause the problems and opportunities the project is addressing.

CLIMATE CHANGE: STEP 1

- To discuss at the Alternatives Milestone
  - Identify **relevant climate factors**
  - **Inland hydrology:**
    - *ECB 2018-14, "Guidance for Incorporating Climate Change Impacts to Inland Hydrology In Civil Works Studies, Designs, And Projects"* (https://www.wbdg.org/ffc/dod/engineering-and-construction-bulletins-ecb/usace-ecb-2018-14).
    - Is a quantitative hydrologic assessment needed?
      - If "yes", contact CPR CoP Lead (Kate White, Will Veatch) before the AMM.
  - **Coastal hydrology:**
    - Is any part of the project ≤ 50 ft NAVD88 or is along a water body within the zone of tidal influence?
      - *ER 1100-2-8162, "Incorporating Sea Level Change in Civil Works Programs"* (https://www.publications.usace.army.mil/Portals/76/Users/182/86/2486/ER_1100-2-8162.pdf?ver=2019-07-02-124841-933)
      - Does the project need to consider the interaction between riverine processes and sea level rise?

https://maps.crrel.usace.army.mil/projects/rcc/portal.html

CLIMATE CHANGE: STEP 2 BEFORE TSP

- Describe the **existing conditions**, including literature review and historic trends analysis using the USACE Climate Hydrology Assessment Tool (CHAT), Nonstationarity Detection Tool, and/or Time Series Toolbox.
- Describe the **future without project conditions**, including literature review, and analysis of future conditions.
  - All Projects: qualitative climate change assessment.
  - Use: CHAT and Civil Works Vulnerability Assessment tools.
  - As needed:
    - Quantitative hydrologic and/or sea level change analyses Results as inputs to the hydrologic and/or hydraulic models.
    - Use: Sea Level Calculator and Sea Level Tracker

- Describe the **future with project climate conditions (impact of action on resource)**
  - Currently no GHG assessment method or guidance
  - The impacts of the project on future hydrologic conditions in the project area would still need to be discussed in the appropriate sections (e.g., if the project alters the stage-frequency relationship in a stream) per other USACE guidance.

https://maps.crrel.usace.army.mil/projects/rcc/portal.html

CLIMATE CHANGE: STEP 3 AFTER TSP

As a section in the description of the TSP:

- Describe the **residual risk due to climate change (**climate impacts that were not addressed in the project design).
- Discuss whether and how climate change impacts were included to make the project more resilient.
- Describe the residual performance risks resulting from changed climate conditions.

Measure	Trigger	Hazard	Harm	Likelihood
Levee	Increased extreme precip	Higher flood stage for design AEP	Levee overtop/ breach	High by mid-century
Floodplain lowering	Increased extreme precip	Higher flood stage for design AEP	None: more extensive inundation benefits T&A species	High by mid-century

https://maps.crrel.usace.army.mil/projects/rcc/portal.html

QUESTIONS TAKEN AT THE END

TOPIC #12: INCORPORATING THE FOUR P&G ACCOUNTS

Planning Mentor Chapter Overview

Section 1- What is it?

- Description of the four P&G accounts (NED, RED, EQ, OSE)
- Examples of benefit categories within each account

Section 2- Who develops it and when is it developed?

- Considerations of how the four accounts are addressed throughout the traditional six-step planning process

Section 3- Advantages

- Consideration of four accounts supports the Agency's initiative to develop and evaluate holistic plans.

Section 4- Examples

- Study Example 1: Incorporating the Four Accounts in the Río Guayanilla, Puerto Rico (PR) Flood Risk Management (FRM) Study
- Study Example 2: Incorporating the Four Accounts in the Great Lakes and Mississippi River Interbasin Study at Brandon Road (GLMRIS-BR)

Section 5- Conclusion

INCORPORATING THE FOUR P&G ACCOUNTS

What is it?

Principles and Guidelines (P&G) (1983) established four accounts to facilitate the evaluation and display of effects of alternative plans: NED, RED, EQ and OSE.

P&G Account	Description
National Economic Development (NED)**	Increases in the net value of the national output of goods and services, expressed in monetary units.
Regional Economic Development (RED)	Changes in the distribution of regional economic activity that result from each alternative plan.
Environmental Quality (EQ)	Changes in the ecological, aesthetic, and cultural attributes of natural and cultural resources.
Other Social Effects (OSE)	Effects from perspectives that are relevant to the planning process, but are not reflected in the other three accounts.

ER 1105-2-100 (Planning Guidance Notebook)	
National Ecosystem Restoration (NER)**	Increases in the net quantity and/or quality of desired ecosystem resources.

INCORPORATING THE FOUR P&G ACCOUNTS

What is it?

P&G Account	Description	Considerations	Examples
National Economic Development (NED)*	Increases in the net value of the national output of goods and services, expressed in monetary units.	• National Economic Efficiency • Net willingness to pay: What you would be willing to pay over and above actual costs (consumer/producer surplus).	• Reductions in flood damages • Reductions in transportation costs • Prevention of emergency and flood clean-up costs • Increases in willingness to pay for improved quality of recreation
Regional Economic Development (RED)	Changes in the distribution of regional economic activity that result from each alternative plan.	• Regional Economic Impacts • Changes in economic activity (jobs, income) within a region.	• Jobs and income supported in a region from: ✓ project construction expenditures ✓ waterborne transportation and support activities ✓ visitor spending on recreation and tourism
Environmental Quality (EQ)	Changes in the ecological, aesthetic, and cultural attributes of natural and cultural resources.	• Displays non-monetary effects. • Includes positive and adverse effects of ecosystem restoration plans.	• Increase in habitat units within the study area • Identification and protection of threatened and endangered species • Mitigation of negative environmental impacts
Other Social Effects (OSE)	Effects from perspectives that are relevant to the planning process, but are not reflected in the other three accounts.	• Focuses on the people and residents of the community. • Includes health and safety issues	• Reduction of life loss or population-at-risk from flooding • Maintaining community cohesion • Changes in social vulnerability • Community resilience

INCORPORATING THE FOUR P&G ACCOUNTS

Section 2- Who develops it and when is it developed?

- **Who:** Metrics are collaboratively developed by the PDT
- **When:** Four accounts are considered early in the planning process to inform:
  - scoping and data gathering
  - metrics that could be used for evaluation and comparison of alternative plans
- **Considerations** for addressing the four accounts throughout the traditional six-step planning process:

Planning Step	Considerations for the Four P&G Accounts
1. Identify Problems and Opportunities	• Consider relevance of problems and opportunities to factors that may influence all four accounts.
2. Inventory and Forecast Conditions	• Gather pertinent data
3. Formulate Alternative Plans	• Consider four accounts to help develop solutions that better align with the needs of the local sponsor and community.
4. Evaluate Alternative Plans	• Connect evaluation criteria with the specific accounts. • Example: quantification of life safety risk for OSE account
5. Compare Alternative Plans	• Evaluation criteria are used to compare the relative benefits and impacts to the four accounts for alternative plans.
6. Select a Plan	• Demonstrate how consideration of the four accounts were used to support screening and selection of the recommended plan.

Ex: high wave energy problem at a harbor may result in:

- ✓ **NED:** damage to infrastructure
- ✓ **EQ:** erosion of near shore habitat
- ✓ **RED:** reduced local recreational boating
- ✓ **OSE:** increased risk to life safety

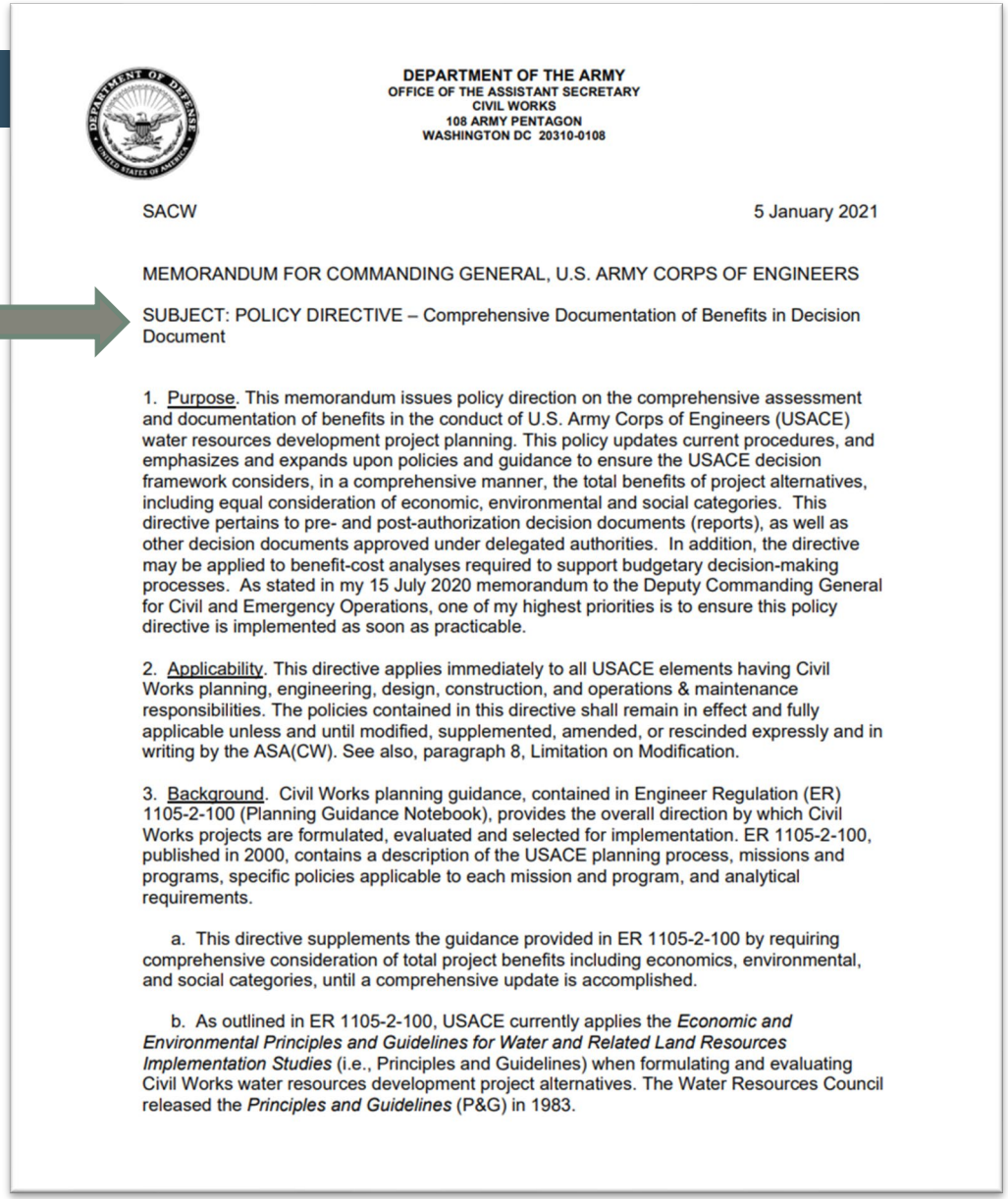
Consider using a table to show a side-by-side comparison of the alternative plans and their impact on the four accounts.

INCORPORATING THE FOUR P&G ACCOUNTS

Advantages

ASA(CW) Policy Directive - Comprehensive Documentation of Benefits in Decision Document (5 Jan 2021)

Para. 3.4: "Project delivery teams (PDTs) must identify and analyze benefits in total and equally across a full array of benefit categories. The level of the analysis will vary based on the magnitude of the change, its relevance to decision-making, and the availability of data, tools, and procedures to quantify or monetize the benefit or impact."



DEPARTMENT OF THE ARMY
OFFICE OF THE ASSISTANT SECRETARY
CIVIL WORKS
108 ARMY PENTAGON
WASHINGTON DC 20310-0108

SACW

5 January 2021

MEMORANDUM FOR COMMANDING GENERAL, U.S. ARMY CORPS OF ENGINEERS

SUBJECT: POLICY DIRECTIVE – Comprehensive Documentation of Benefits in Decision Document

1. Purpose. This memorandum issues policy direction on the comprehensive assessment and documentation of benefits in the conduct of U.S. Army Corps of Engineers (USACE) water resources development project planning. This policy updates current procedures, and emphasizes and expands upon policies and guidance to ensure the USACE decision framework considers, in a comprehensive manner, the total benefits of project alternatives, including equal consideration of economic, environmental and social categories. This directive pertains to pre- and post-authorization decision documents (reports), as well as other decision documents approved under delegated authorities. In addition, the directive may be applied to benefit-cost analyses required to support budgetary decision-making processes. As stated in my 15 July 2020 memorandum to the Deputy Commanding General for Civil and Emergency Operations, one of my highest priorities is to ensure this policy directive is implemented as soon as practicable.

2. Applicability. This directive applies immediately to all USACE elements having Civil Works planning, engineering, design, construction, and operations & maintenance responsibilities. The policies contained in this directive shall remain in effect and fully applicable unless and until modified, supplemented, amended, or rescinded expressly and in writing by the ASA(CW). See also, paragraph 8, Limitation on Modification.

3. Background. Civil Works planning guidance, contained in Engineer Regulation (ER) 1105-2-100 (Planning Guidance Notebook), provides the overall direction by which Civil Works projects are formulated, evaluated and selected for implementation. ER 1105-2-100, published in 2000, contains a description of the USACE planning process, missions and programs, specific policies applicable to each mission and program, and analytical requirements.

a. This directive supplements the guidance provided in ER 1105-2-100 by requiring comprehensive consideration of total project benefits including economics, environmental, and social categories, until a comprehensive update is accomplished.

b. As outlined in ER 1105-2-100, USACE currently applies the *Economic and Environmental Principles and Guidelines for Water and Related Land Resources Implementation Studies* (i.e., Principles and Guidelines) when formulating and evaluating Civil Works water resources development project alternatives. The Water Resources Council released the *Principles and Guidelines* (P&G) in 1983.

INCORPORATING THE FOUR P&G ACCOUNTS

Example: FRM Study

Río Guayanilla, Puerto Rico (PR) Flood Risk Management (FRM) Study

- Analyzed problems and opportunities regarding life safety, economic sustainability, and the ecosystem.
- NED was the primary focus for identifying the recommended plan. The other accounts were considered in the discussions that led to the final decision.

Evaluation Metrics for Four Accounts

NED	RED
• Flood damages to the community • Flood cleanup costs • National Flood Insurance Program (NFIP) operating costs • Emergency costs related to Public Assistance and Other Needs Assistance Programs • Unemployed and underemployed labor resources	• A quantitative RED evaluation was not conducted since USACE's certified regional economic impact model does not encompass Puerto Rico.
EQ	**OSE**
• Qualitative impacts to threatened and endangered species • Qualitative impacts to wetlands	• Life Loss and population-at-risk • Social vulnerability • External community investment • Impacts to total population and community cohesion • Unemployment and poverty rates

- **Substantial uncertainty** regarding magnitude of NED benefits at onset of study
- **PDT fully evaluated and documented** benefits across three of the four accounts
- **This helped the PDT, vertical team, stakeholders, and public** understand the variety of ways that this project would benefit and protect the Guayanilla community.

Feasibility report available at the following link:
https://www.lrc.usace.army.mil/Portals/36/docs/projects/Rio%20Guayanilla/2020/02_RG_FRMReport_FinalReport_FINAL.pdf

INCORPORATING THE FOUR P&G ACCOUNTS

Example: Ecosystem Protection Study

Great Lakes and Mississippi River Interbasin Study at Brandon Road (GLMRIS-BR)

- Focused on preventing the upstream transfer of Mississippi River Basin aquatic nuisance species (ANS) into the GL Basin.
- The PDT developed alternatives with consideration of stakeholder interests.
- Study recommendation- install a control point at Brandon Road Lock and Dam (BRLD) in Joliet, Illinois to safeguard:
  - GL ecosystem and its numerous dependent industries
  - nation's investment in inland navigation.

Examples of GLMRIS-BR Evaluation Criteria Metrics, Stakeholders, and Four Accounts

GLMRIS-BR Specific Evaluation Criteria		Stakeholder Interests	Rating Method for Evaluation Criteria	4 Accounts
Relative life safety risks		Navigation	Low, Intermediate, or High	OSE
Sociopolitical consequences of ANS establishment (Chapter 5)		Great Lakes States	Qualitative description	OSE and EQ
Economic consequences of ANS establishment (Chapter 5)		Great Lakes States	Changes in Economic Value	NED
			Changes in Regional Employment, Labor, Income, Output and Value Added	RED
Impacts to Commercial Cargo Navigation		Navigation Community & State of Illinois	Average Annual Costs,	NED
			Changes in Regional Employment, Labor, Income, Output and Value Added.	RED
Probability of ANS establishment		All	Percentage of Occurrence (%)	OSE and EQ
System performance robustness	Ability to cycle in Nonstructural	State of Illinois Federal Agencies	Yes (indicated by symbol) or No (indicated by lack of symbol) 	The alternative differences which are displayed by these metrics informed the Elicitation of Probability of ANS Establishment (EQ and OSE)
	Ability to cycle in Structural	State of Illinois Federal Agencies	Yes (indicated by symbol) or No (indicated by lack of symbol) 	
	Number of Structural Control Points	State of Illinois Federal Agencies	Number (indicated with corresponding number of symbols) 	
	Modes of Transport	Federal Agencies	Swimmer  Floater  Hitchhiker 	

- Plan's selection and justification not based solely on NED metrics or NER analysis.
- Recommended plan maximized project effectiveness while:
  - reducing NED and RED impacts associated with project implementation and
  - minimizing potential negative NED, RED, OSE and effects of Mississippi River Basin ANS establishment in the GL Basin.

Feasibility report available at the following link: https://usace.contentdm.oclc.org/utils/getfile/collection/p16021coll7/id/11394

INCORPORATING THE FOUR P&G ACCOUNTS

Conclusion

- **P&G** established four accounts (NED, RED, EQ, and OSE) to facilitate the evaluation and display the effects of alternative plans.
- **Four accounts** should be considered early (and throughout) the planning process
- **ASA(CW) Policy Directive** (5 January 2021) directs USACE to comprehensively assess and document benefits
- **Examples** of about how the four accounts were used in FRM and ecosystem restoration studies are available
- When all project benefits and impacts are considered…
  - the formulation and evaluation of alternatives is more complete
  - leads to **more holistic Civil Works investment decisions**.

QUESTIONS, FEEDBACK, IDEAS

- Karen.V.Miller@usace.army.mil
  Work: 304-399-5859
  Cell: 304-544-6371

- Lawrence.L.Skaggs@usace.army.mil
  Cell: 904-251-4769

- **Planning Quick Takes (Version 2.0)** will be posted to Planning Community Toolbox soon

- **Planning Mentor Handbook (Version 1.0):** https://planning.erdc.dren.mil/toolbox/library/IWRServer/PlanningMentorHandbook_Ver1.0_30June2020.pdf

QUESTIONS?

US Army Corps
of Engineers®