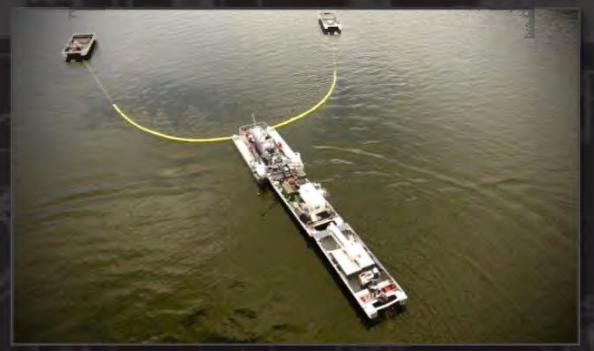
PLANNING FOR INNOVATION IN THE CIVIL WORKS PROJECT DEVELOPMENT PROCESS

As of 07 September 2023

MICHAEL F. WINKLER
Strategic Integration Officer
Strategic Integration Office of ERDC



U.S. ARMY

US Army Corps of Engineers®

Controlled by: USACE/CEERD-ZBS
Category: Approved for Public Release
Distribution Statement: A
POC: ERDC Strategic Integration Office, 601-634-5239,
Martin.C.Kittrell@usace.army.mil

USACE CIVIL WORKS: OPERATIONALIZING R&D OUTCOMES

Changing the Paradigm for Leveraging the Benefits from R&D

U.S. ARMY

Congressional Authorizations via Water Resources Development Act (WRDA)

GI Approps | **CG Approps** | **O&M Approps**

STAKEHOLDER NEED → STUDY → **CHIEF'S REPORT** → DESIGN → BUILD → OPERATE & MAINTAIN → DECOMMISSION

"911 ERDC"

New Science & Technology Innovation Insertion

Left of BANG

- More Options?
- Less Time (3x3x3)
- Less $$$ (GI)

Chief's Report (BANG)

Right of BANG

- Conditions are "Set"
- More Time (no "3x3x3")
- Diminishing Returns on Beneficial Effect of New Technology?

Is There a Better Way?

- More "Left of Bang" S&T Considerations?
- Account for Technological Innovation during Planning?

HOW DO YOU DEFINE INNOVATION?

Type your response in the Chat and send to “Everyone”

CIVIL WORKS PROJECT DEVELOPMENT PHASES

A. **Initiation Phase**

B. **Feasibility Phase**

C. Design Phase

D. Construction Phase

E. Operation, Maintenance, Repair, Replacement, and Rehabilitation Phase (OMRR&R)

CIVIL WORKS DEVELOPMENT PHASES

1. Identify a Problem
2. Obtain Federal Study Authority
3. Letter of Intent from Sponsor
4. Congress Appropriates Study Funds

Initiation Phase

1st Opportunity to Consider S&T Innovation.

The Earlier the Innovation Needs are Identified the Better!

CIVIL WORKS DEVELOPMENT PHASES

5. **Execute Feasibility Cost Share Agreement (FCSA) and Secure Sponsor Study Funding**
6. **Scope** and Conduct Study
7. Release Draft Feasibility Report for Concurrent Review
8. Complete Final Feasibility Report for Coordination and Submission
9. Policy Review of Final Feasibility Report
10. Federal and State Agency Review
11. Sign Chief of Engineers Report
12. Administration Review of Chief of Engineers Report

Feasibility

2nd Opportunity to Consider S&T Innovation.

FIVE PARALLEL PATHWAYS FOR INNOVATION CONSIDERATION

1. Negotiate Innovation Opportunities with Non-Federal Sponsor prior to signing the FCSA
2. Water Operations Technical Support (WOTS)
3. Dredging Operations Technical Support (DOTS)
4. Statements of Need Processes
5. Request 3x3x3 Wavier

WHICH OF THE PARALLEL PATHWAYS TO FUND INNOVATION HAVE YOU USED BEFORE?

Type your response in the Chat and send to “Everyone”

WHAT ROADBLOCKS DO YOU THINK PDTs FACE WHEN IT COMES TO BEING INNOVATIVE?

Type your response in the Chat and send to “Everyone”

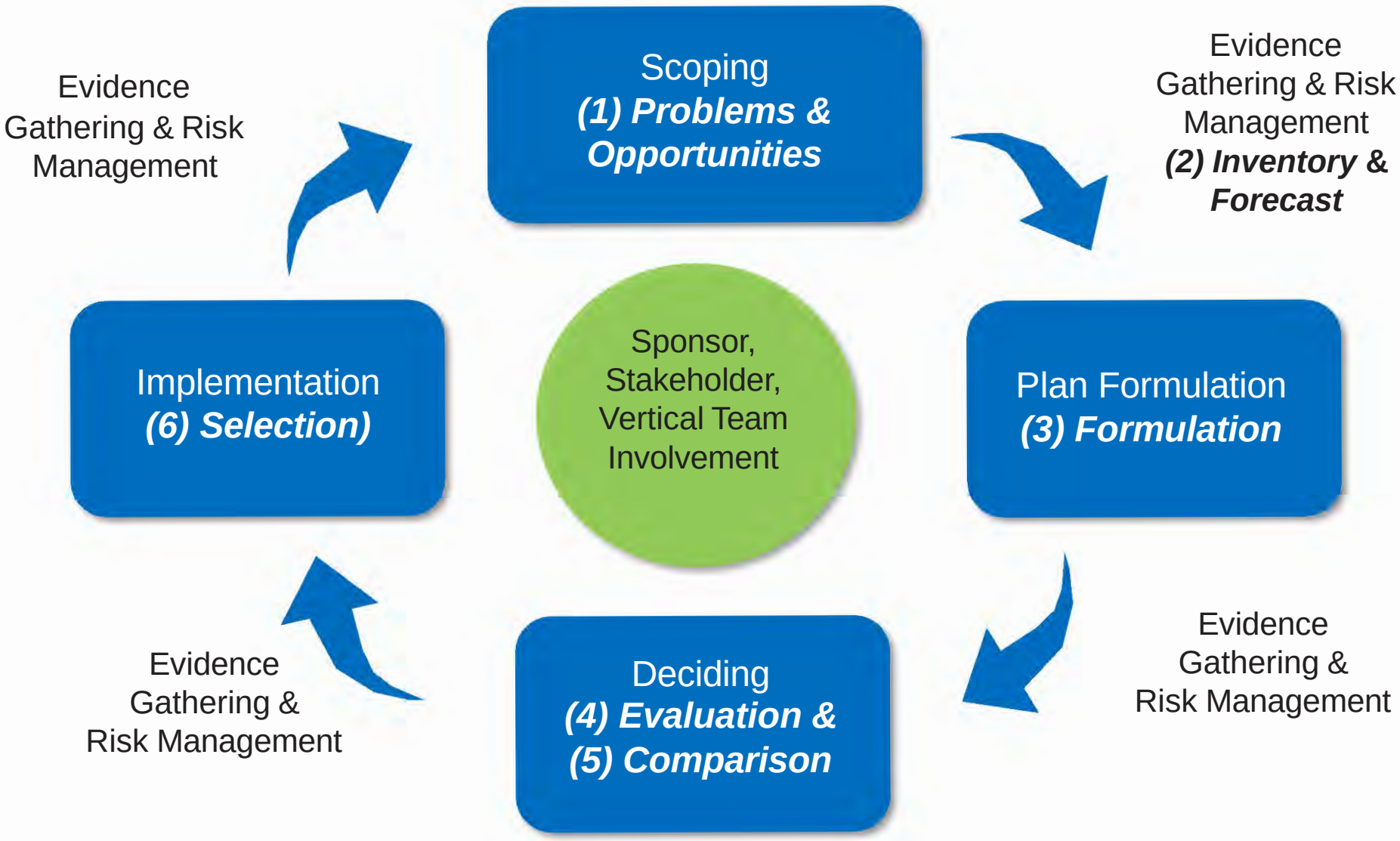
FEASIBILITY PHASE

Scoping and the 6-Step Risk-Informed Planning Process

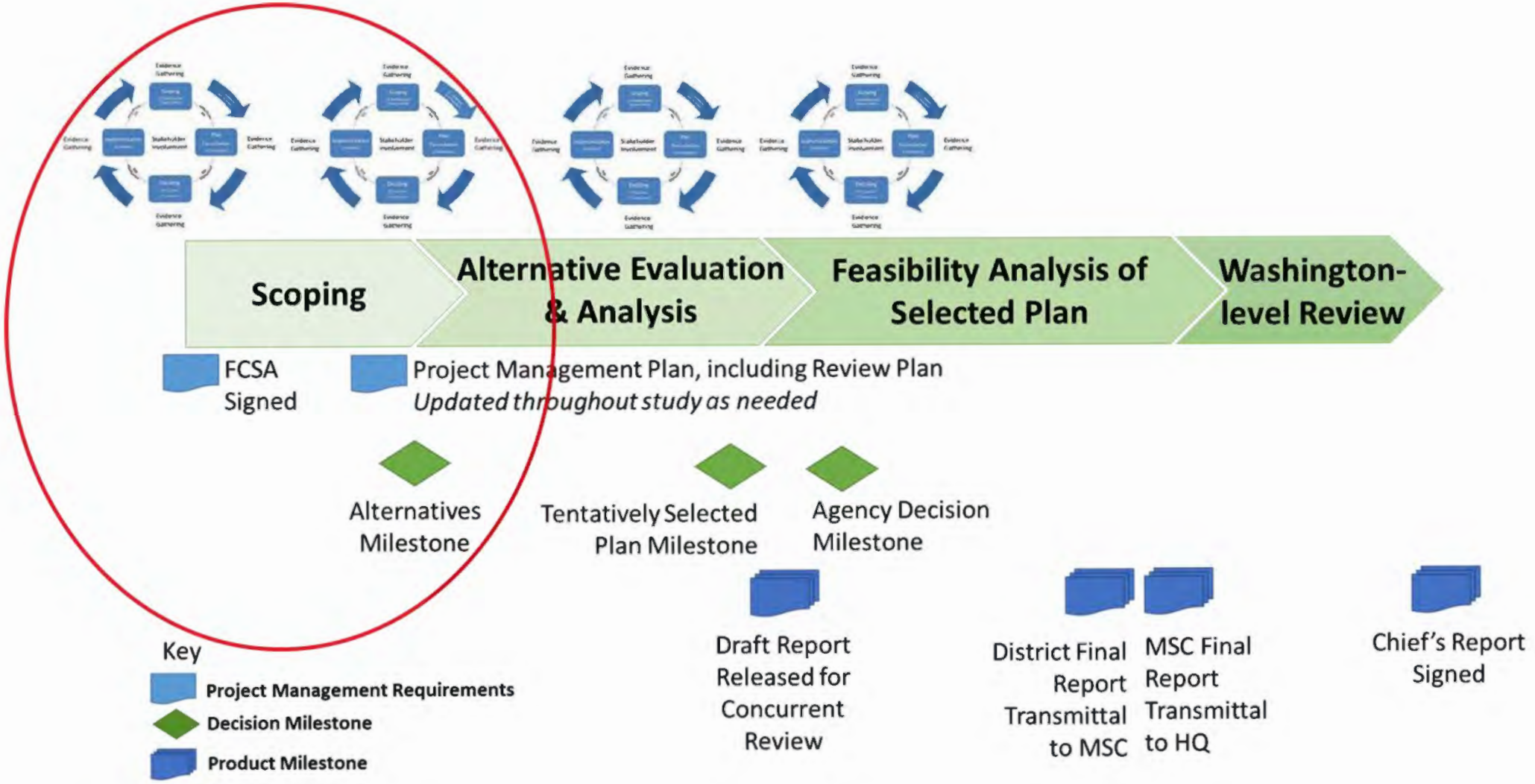
U.S. ARMY

US Army Corps of Engineers®

RISK-INFORMED PLANNING PROCESS



ITERATE THE 6-STEP PLANNING PROCESS AND GATHER EVIDENCE TO REDUCE UNCERTAINTY AND MANAGE STUDY AND PROJECT RISK



FIRST 30 DAYS: 1ST ITERATION, UTILIZE THE KNOWLEDGE ON THE TEAM

U.S. ARMY

We'll ID our Biggest Data Gaps, Plug 'em, then do it all again.

Are your S&T SMEs at the Table?

PROJECT INNOVATION CONSIDERATIONS

Technical Drivers

- ✓ **Dynamic Landscape** - Are there any technical areas or aspects of the project that could clearly benefit from incorporating science and technology advances regarding new approaches, new materials, new processes, or innovative solutions not previously considered or implemented?
- ✓ **Uncertainties** - Are there any technical areas or aspects of the project that are associated with significant uncertainties or based on assumptions not previously validated?
- ✓ **Range of Applicability** - Are there any technical areas or aspects of the project for which there are no currently applicable engineering guidelines, or the methods used in practice are outdated?
- ✓ **Technical Risks** - Are there any technical areas or aspects of the project that rely on technologies not yet fully validated or approaches still subject to debate by the scientific community?

PROJECT INNOVATION CONSIDERATIONS

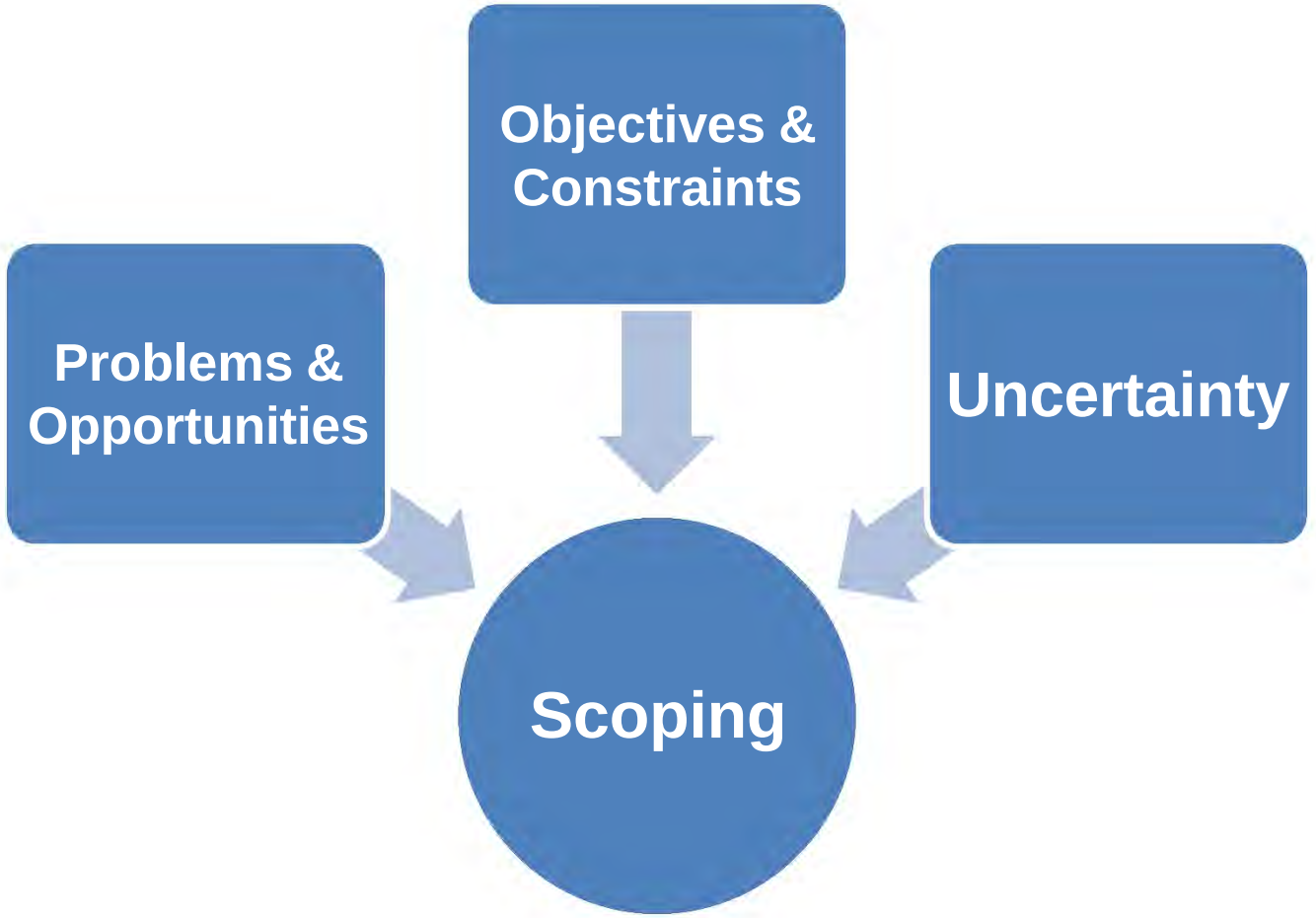
Technical Drivers

- ✓ **Historical Performance** - Are there any technical areas or aspects of the project that are known to have triggered repeated disruptions impacting execution and delivery in circumstances similar to the ones under consideration?
- ✓ **Stakeholder Requirements** - Are there any technical areas or aspects of the project currently or potentially leading to positive interest or negative attention from external stakeholders or communities that could be addressed by alternative or modified technologies?
- ✓ **Interdependencies** - Are there any technical areas or aspects of the project that could be potentially affected by emerging technologies, global trends, interdependencies, or supply chain disruptions?
- ✓ **Potential Benefits**

  Will the incorporation of science and technology advances could yield positive outcomes by addressing key problems, opportunities, or gaps along the critical path of the project, activity, or function?

WHAT IS SCOPING?

Task 1 of Risk-Informed Planning Process



SCOPING PHASE – THE FIRST 30 DAYS (AFTER SIGNING FCSA)

- **Initial PDT Meeting**
- Hold **first planning iteration** to identify POOCs, Existing Conditions, Future Without Project Condition, Measures, Alternatives, and Key Uncertainties
- Document the results in the **6 pieces of paper**
- Send out scoping letters; invite **Cooperating Agencies**

30-60 DAYS: 2ND ITERATION, UTILIZE WHAT OTHERS KNOW

SCOPING PHASE – DAY 30-60
(AFTER SIGNING FCSA)

- **Conduct literature reviews and additional research to help reduce uncertainties.**
- Hold an **Interagency Coordination Meeting**
- Hold **Planning Charrette / 2nd Iteration**
- Fill out **Risk Register**
- Draft **Review Plan** in coordination with PCX and MSC

SCOPING PHASE – DAY 60-90 (AFTER SIGNING FCSA)

- **Establish PMP** including scope of work, budget and schedule for study
  - What information / analyses do we need to resolve uncertainties, select a plan, and complete feasibility level design?
- Hold **Alternatives Milestone Meeting**
- Develop **Vertical Team Alignment Memo** (signed within 120 days)

INNOVATION EXAMPLES

USACE R&D Priorities that align with ERDC Innovations

Mitigate and Adapt Climate Change

Forecast-Informed Reservoir Operations (FIRO)

Modernize out Nation's Infrastructure

Structural Health Monitoring

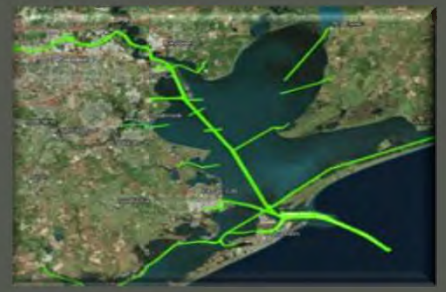
Support Resilient Communities

Coastal Hazards Rapid Prediction System

Ensure Environmental Sustainability and Resilience

Engineering with Nature® – Lagoon created at Deer Island, Mississippi Sound

Revolutionize and Accelerate Decision Making



Dredging Optimization

Improve Cyber and Physical Security

Security Systems to Support System Authorization

Protect and Defend the Arctic

H&H Modeling of Snowpack Thaw & Runoff

HOW CAN PLANNING LEADERSHIP SUPPORT AND EMPOWER PDTs TO BE MORE INNOVATIVE?

Type your response in the Chat and send to “Everyone”

CAN YOU NAME YOUR MSC S&T CADRE LEAD?

Type your response in the Chat and send to “Everyone”

USACE MSC S&T CADRE

Primary S&T POC

MSC, DEPUTY MSC AND ERDC DISTRICT LIAISONS

Connecting USACE MSCs and Districts to ERDC Expertise

Great Lakes and Ohio River Division (LRD)

- **MSC Liaison:** Dr. Edmond Russo
- **Deputy MSC Liaison:** Dr. Jennifer Seiter-Moser
- **Buffalo District (LRB):** Mr. Michael Greer
- **Chicago District (LRC):** Dr. Brook Herman
- **Detroit District (LRE):** Dr. Dave Smith
- **Huntington District (LRH):** Dr. Christine VanZomeren
- **Louisville District (LRL):** Dr. Rich Fischer
- **Nashville District (LRN):** Dr. Andrew McQueen
- **Pittsburgh District (LRP):** Dr. Tony Bednar

North Atlantic Division (NAD)

- **MSC Liaison:** Dr. Joseph (Joe) Corriveau
- **Deputy MSC Liaison:** Dr. Robert (Bert) E. Davis
- **Baltimore District (NAB):** Dr. Julie Rosati
- **New England District (NAE):** Dr. Igor Linkov
- **New York District (NAN):** Dr. Kyle McKay
- **Norfolk District (NAO):** Mr. Dave Finnegan
- **Philadelphia District (NAP):** Dr. Cary Talbot
- **Europe District (NAU):** Mr. Andy Margules

Mississippi Valley Division (MVD)

- **MSC Liaison:** Dr. Ty Wamsley
- **Deputy MSC Liaison:** Mr. Eddie Wiggins
- **St. Paul District (MVP):** Dr. Gaurav Savant
- **Rock Island District (MVR):** Dr. Gaurav Savant
- **St. Louis District (MVS):** Mr. Eddie Wiggins
- **Memphis District (MVM):** Mr. Eddie Wiggins
- **Vicksburg District (MVK):** Mr. Keith Flowers
- **New Orleans District (MVN):** Dr. Julie Rosati

Northwestern Division (NWD)

- **MSC Liaison:** Dr. Andy Nelson
- **Deputy MSC Liaison:** Dr. Robert (Rob) M. Wallace
- **Kansas City District (NWK):** Dr. George Calfas
- **Omaha District (NWO):** Dr. George Calfas
- **Portland District (NWP):** Mr. Quincy Alexander
- **Seattle District (NWS):** Mr. Quincy Alexander
- **Walla Walla District (NWW):** Mr. Quincy Alexander

As of 07 SEP 2023

MSC, DEPUTY MSC AND ERDC DISTRICT LIAISONS

Connecting USACE MSCs and Districts to ERDC Expertise

Pacific Ocean Division (POD)

- **MSC Liaison:** Mr. Bartley (Bart) Durst
- **Deputy MSC Liaison:** Dr. Elizabeth Ferguson
- **Alaska District (POA):** Dr. Tom Douglas
- **Far East District (POF):** Mr. James L. Davis, Dr. Jason Roth, ST
- **Honolulu District (POH):** Dr. Elizabeth Ferguson
- **Japan District (POJ):** Dr. Elizabeth Ferguson

South Atlantic Division (SAD)

- **MSC Liaison:** Dr. Ty Wamsley
- **Deputy MSC Liaison:** Dr. Julie Rosati
- **Charleston District (SAC):** Dr. Ned Mitchell
- **Mobile District (SAM):** M**r.** Eddie Wiggins
- **Jacksonville District (SAJ):** Ms. Ashley Frey
- **Savannah District (SAS):** Dr. Ned Mitchell
- **Wilmington District (SAW):** Dr. Julie Rosati

Transatlantic Division (TAD)

- **MSC Liaison:** Mr. Bartley (Bart) Durst
- **Deputy MSC Liaison:** Mr. Nicholas (Nick) Boone
- **Transatlantic Expeditionary District (TAE)** and **Middle East District (TAM):** Mr. Nicholas (Nick) Boone

South Pacific Division (SPD)

- **MSC Liaison:** Dr. David Horner
- **Deputy MSC Liaison:** Dr. Cary Talbot
- **Albuquerque District (SPA):** Dr. Jackie Pettway
- **Sacramento District (SPK):** Dr. Robert (Rob) M. Wallace
- **Los Angeles District (SPL):** Mr. Ivan Beckman
- **San Francisco District (SPN):** Mr. Ken Pathak

Southwestern Division (SWD)

- **MSC Liaison:** Dr. Edmond Russo
- **Deputy MSC Liaison:** Dr. Patrick (Pat) Deliman
- **Fort Worth District (SWF):** Dr. Rumanda Young
- **Galveston District (SWG):** Ms. Susan Wolters
- **Little Rock District (SWL):** Dr. Eric Britzke
- **Tulsa District (SWT):** Dr. Mandy Michalsen

Huntsville Engineering Center (HNC)

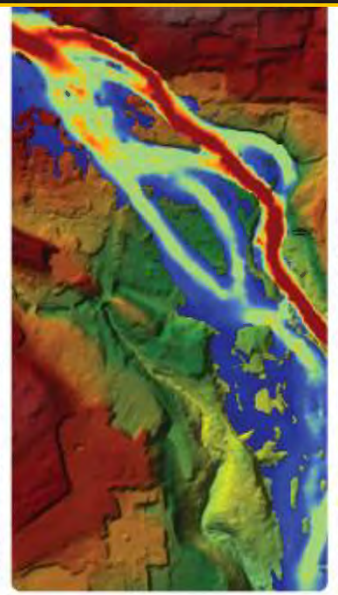
- **MSC Liaison:** Dr. Andy Nelson
- **Deputy MSC Liaison:** Dr. Elizabeth Ferguson

As of 07 SEP 2023

U.S. Army Corps of Engineers

RESEARCH & DEVELOPMENT

Laying the Foundation for a New Bold Era of USACE R&D



U.S. ARMY

US Army Corps of Engineers®

Questions?

Comments?

PROJECT MANAGEMENT PLANS

Project Management Plans

- ✓ Manage all projects with a Project Management Plan (PMP). To meet mission objectives, each project is managed under a project management plan (PMP). A PMP is a roadmap for quality project delivery. The PM and the PDT work with the stakeholder early in the project planning process to determine the stakeholder's needs, and to refine those requirements in light of quality, safety, fiscal, schedule, legal, communications, change management and other constraints. The PDT measures its success against the expectations documented in the PMP, which is an agreement between USACE and the stakeholder that defines project objectives and project-specific quality control procedures appropriate to the size, complexity, acquisition strategy, project delivery, and nature of each product. It should be signed by all PDT members, including the stakeholder, to document their commitment to project success.

1. **Scope**
2. **Team Identification**
3. **Critical Assumptions and Constraints**
4. **Work Breakdown Structure (WBS)**
5. **Schedule**
6. **Project Cost**
7. **Change Management**
8. **Value Engineering**
9. **Communications and Reporting**
10. **Risk Management**
11. **Quality Management**
12. **Acquisition Strategy**
13. **Safety**
14. **Data Management**
15. **Closeout**

PLANNING & POLICY DIVISION
VERTICAL TEAM ALIGNMENT MEMORANDUM (VTAM)

Content:

1. Follow the VTAM template provided via e-mail on 5 May 2022.
2. In accordance with the VTAM template, the VTAM will cover the following information:

- References
- Purpose
- Background
- Study Scope
- Plan Formulation
- Risk and Uncertainty
- Numerical Modeling Tools and Software
- Project Management Plan (PMP)
- Environmental Justice (EJ)
- Study Schedule and Funding Stream
- 3x3x3 Rule Compliance
- Vertical Team Alignment

> …I've asked Dr. Pittman to **assign ERDC LNOs** to all of our MSCs and Districts. I expect that you'll "hug" them as one of your own and **treat them as valued members** of your extended, virtual staff. You should develop them as you would any one of your team, so **they know your missions** as well as you. They'll start by asking, "How can I support you?" and, with your help, **they'll eventually proactively come to you, before you know to ask, with solutions you couldn't know existed**. And in the process, you'll learn the **right questions to ask** of our R&D team. Only this type of partnership and relationship can make us successful.

LTG SCOTT SPELLMON
USACE Commander
Email to Corps Leaders
25 AUGUST 2021

How to Join the ERDC Liaisons MS Teams Page

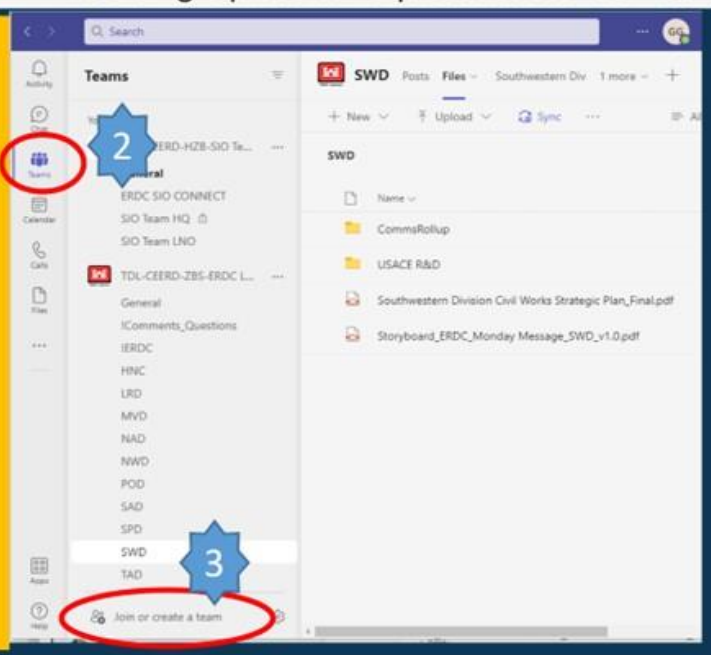
ERDC Liaisons

TDL-CEERD-ZBS-ERDC LIAISONS

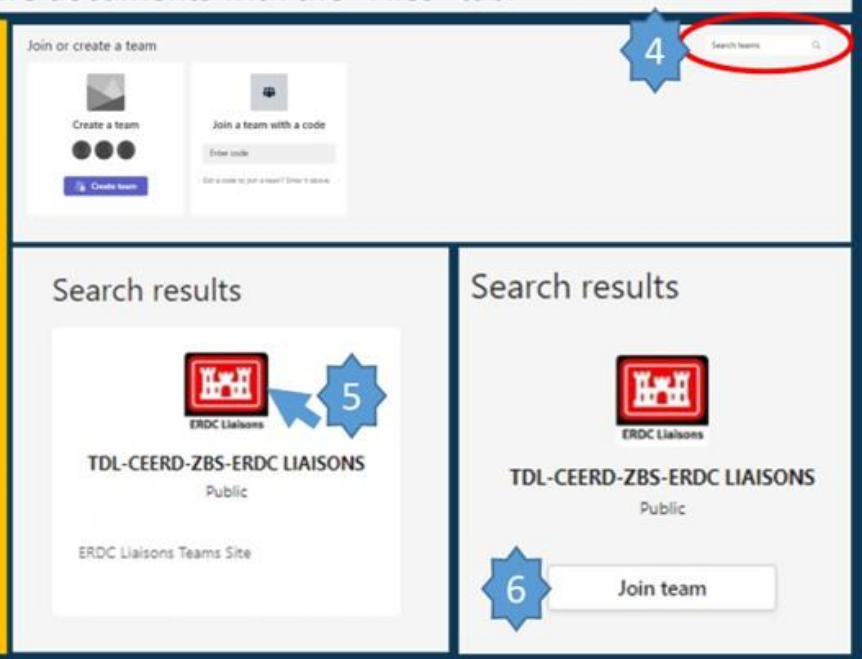
The ERDC Liaisons Microsoft Teams site contains information and documentation for ERDC MSC engagements. Each Division has its own channel to facilitate communication and collaboration. The "Posts" tab provides those outside of ERDC a single place to request assistance. You can also easily share documents with the "Files" tab.

To join the ERDC Liaisons MS public Teams page:

1. Log into USACE MS Teams
2. Select the "Teams" icon on the left-hand side
3. Select "Join or create a team"



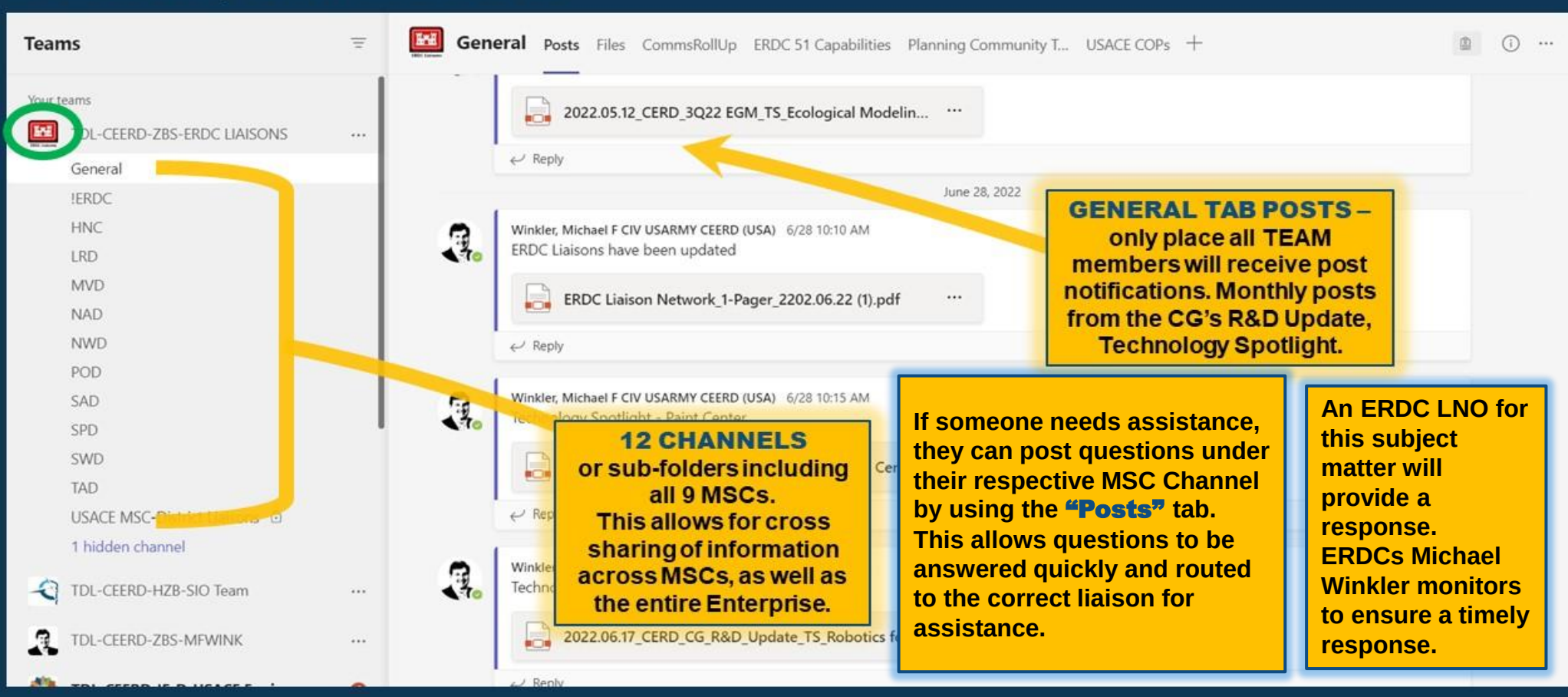
4. Use Search Box in upper right corner to search for TDL-CEERD-ZBS-ERDC LIAISONS. It is case sensitive, so use all caps.
5. Move your mouse over the Team site.
6. Select "Join team"



The ERDC Liaisons Teams site is officially titled: TDL-CEERD-ZBS-ERDC LIAISONS

ERDC Liaisons MS Teams Page

12 CHANNELS / GENERAL TAB POSTS



Delivering Solutions

ERDC SUPPORTS USACE'S TOP 10 RESEARCH & DEVELOPMENT PRIORITIES

1. Mitigate and Adapt to Climate Change
2. Win Future Wars
3. Modernize our Nation's Infrastructure
4. Support Resilient Communities
5. Enable Smart and Resilient Installations
6. Ensure Environmental Sustainability and Resilience
7. Secure Reliable Installation Energy
8. Revolutionize and Accelerate Decision Making
9. Improve Cyber and Physical Security
10. Protect and Defend the Arctic