The Use of *In Vitro* Soil Metal Bioavailability Methodologies to Adjust Human and Ecological Risk Assessment

ESTCP Sponsored Workshop
September 15, 2005
Holiday Inn by the Bay
San Diego, CA

Workshop Background

Problem:

- **DoD has many metal contaminated sites**
- **With the exception of Pb, metal is often considered 100% bioavailable to human and ecological receptors**
- **Overestimation of bioavailability results in unacceptable risk at many sites**
- **Conservative risk assessments may result in unnecessary and costly remedial action**

Workshop Background

Extensive research has shown:

- **Metal bioavailability is often much less than 100%**
- **Soil properties modify metal bioavailability**
- **USEPA human and ecological risk frameworks can adjust for metal bioavailability, providing accurate risk assessments**
- **Risk assessments that adjust for metal bioavailability may reduce the burden of unnecessary and costly remedial action**

ESTCP Sponsored Project

The Effect of Soil Properties on Decreasing Toxic Metal Bioavailability: Field Scale Validation to Support Regulatory Acceptance

Project Objectives:

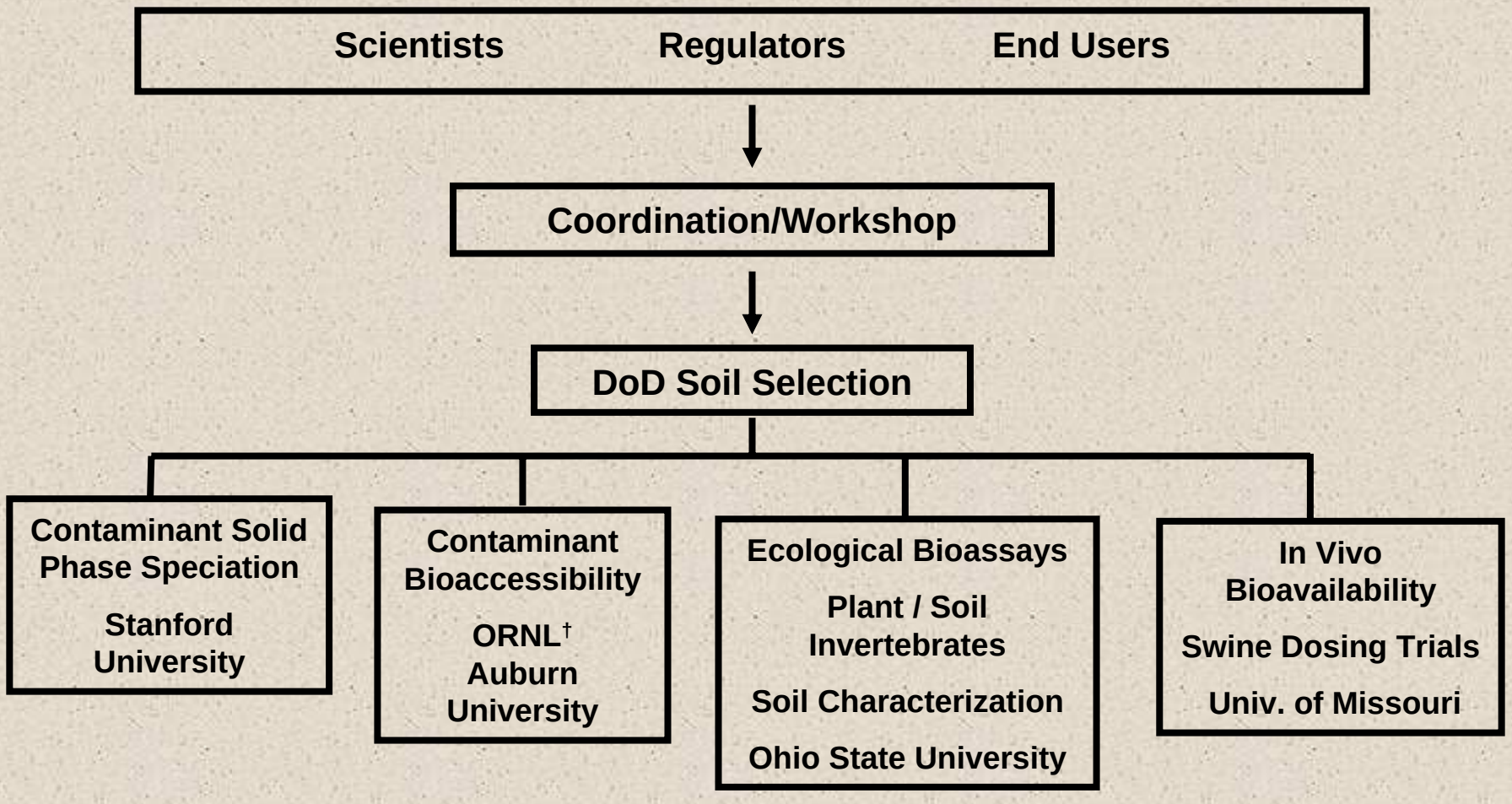
To demonstrate the use of *in vitro* bioavailability methods to adjust risk assessment for metal contaminated soils at DoD sites.

To demonstrate the use of soil properties as a screening step for bioavailability

To demonstrate methodologies developed from Strategic Environmental Research and Development Program (SERDP) projects and gain regulatory acceptance:

- **Quantifying the Bioavailability of Toxic Metals in Soils (CU-1166), Human risk**
- **Determining the Bioavailability, Toxicity, and Bioaccumulation of Organic Chemicals and Metals for the Development of Eco-SSLs (CU-1210), Ecological risk**

ESTCP Project Overview



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Principal Investigators

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Dr. Nicholas Basta, Associate Professor, Soil and Environmental Chemistry
Dr. Roman Lanno, Associate Professor, Soil and Environmental Ecotoxicology
Dr. Elizabeth Dayton, Research Scientist, Soil and Environmental Chemistry

University of Missouri at Columbia, Columbia, MO
Dr. Stan Casteel, Professor of Toxicology and Director of Veterinary Medical Diagnostic Laboratory

Stanford University, Stanford, CA
Dr. Scott Fendorf, Associate Professor, Geological and Environmental Science

Workshop Participants

California DTSC

Dr. John Christopher

Dr. Steve DiZio

DoD

Mr. Chris Leadon – Navy

Dr. Tony Palazzo – Army

Mr. Steve Tyahla - Navy

Universities

Dr. John Drexler – University of Colorado

Dr. Paul Schwab – Purdue University

US EPA

Dr. James Ryan

Dr. David Charters

Dr. Marc Greenberg

Workshop Agenda

- **8:30 am** – Welcome and Introductions
- **8:45 am** - Metal Bioavailability in USEPA Human Risk Assessment Framework (Dr. James Ryan)
- **9:25 am** - Metal Bioavailability in USEPA Terrestrial Ecological Risk Assessment Framework (Dr. Mark Sprenger)
- **10:05 am** - Break
- **10:20 am** – DoD Case Study: Practical Application of Bioavailability Assessment (Dr. Loren Lund)
- **11:00 am** - ESTCP Project Overview (Ms. Amy Hawkins)
- **11:45 am** – Lunch
- **1:00 pm** – Presentation of Challenge Questions
- **1:15 pm** – Challenge Question #1 Discussion
- **1:50 pm** – Challenge Question #2 Discussion
- **2:25 pm** – Break
- **2:40 pm** – Challenge Question #3 Discussion
- **3:15 pm** – Challenge Question #4 Discussion
- **3:50 pm** – Summary and Wrap Up

Logistics

Coffee

Lunch

Bathrooms

Phones

Sign-in Sheet