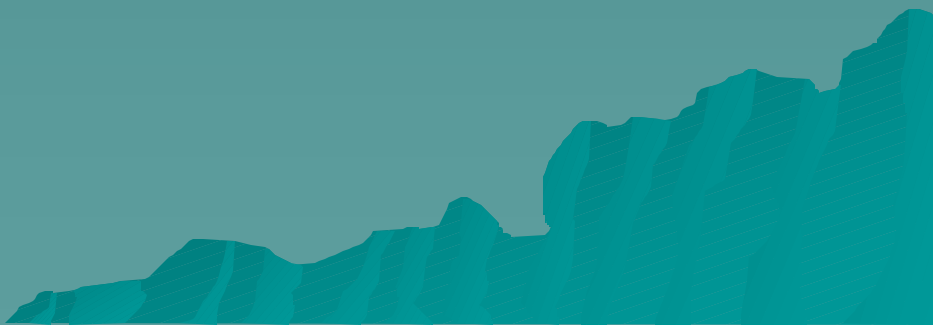


# *US Environmental Protection Agency*

## Hazardous Substance Research Centers



# *HSRC Mission*

- ◆ Short- and long-term research on manufacture, disposal, clean-up, and management of hazardous substances.
  - ◆ Dissemination of research information and findings.
  - ◆ Training, technology transfer, and technical outreach and support.
- 

# *History of the HSRCs*

- ◆ The HSRC program was created by Congress in 1989.
- ◆ Initial role was to assist with federal Superfund statute through research.
- ◆ In mid-1990s, role was expanded to include outreach services.
- ◆ Five centers were chosen to represent region pairs.

# *HSRC Program: 1989-2001*

- ◆ >\$150 million in funding
- ◆ 1250 technical articles
- ◆ 27 patents
- ◆ 21 new technologies
- ◆ 162 field demonstrations
- ◆ >300 outreach communities

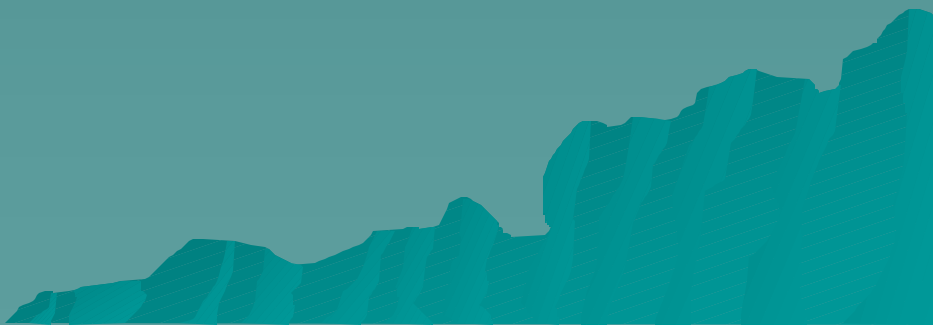
# *HSRC Program: 2001-2006*

- ◆ Five new HSRCs were selected in 2001.
- ◆ Each Center's funding level is approximately \$1,000,000/year.
- ◆ 70% of funds used for research.
- ◆ 30% of funds used for outreach.
- ◆ Unique research focus for each center.
- ◆ EPA regional associations were modified.

# *HSRC Program: 2001-2006*

- ◆ Northeast HSRC for Urban Environments
  - Outreach for EPA Regions 1, 2, 3
  - Research focuses on metropolitan areas
  - University partners
    - ◆ John Hopkins
    - ◆ University of Maryland
    - ◆ Morgan State University
    - ◆ University of Connecticut
    - ◆ New Jersey Institute of Technology

# *Current Northeast HSRC projects*

- ◆ Exposure pathways for airborne contaminants
  - ◆ Transport of hazardous aerosols
  - ◆ Fate and transport of heavy metals and hazardous organics in groundwater and soils
  - ◆ New measurement techniques for chromium toxicity
- 

# *HSRC Program: 2001-2006*

## ◆ Midwest HSRC

- Outreach for EPA Regions 5 and 7
- Research focuses on low-cost in-situ technologies
- University partners

Purdue University

Virginia Tech

University of Cincinnati

Michigan State University

University of Missouri

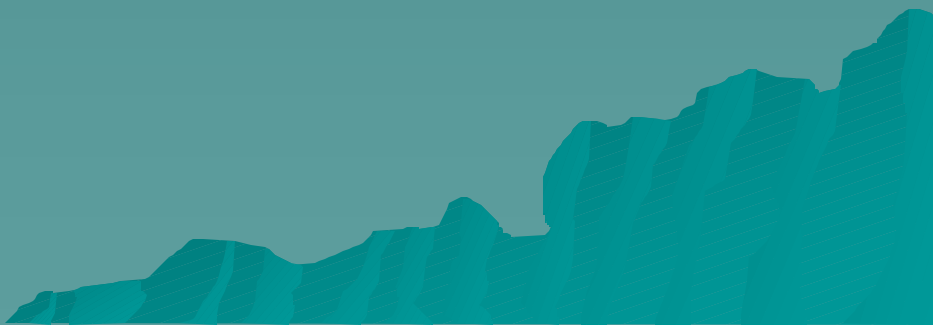
Kansas State University

Central State University

Haskell Indian Nations U.

Howard University

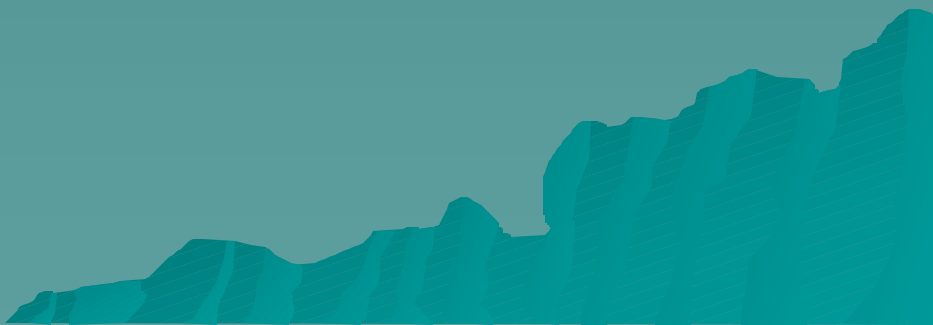
# *Current Midwest HSRC projects*

- ◆ Phytoremediation of dredged sediments
  - ◆ Monitored natural attenuation of TCE
  - ◆ Constructed wetlands for heavy metal removal
  - ◆ Bioremediation stressors
  - ◆ Sustainable phytoremediation
  - ◆ Biodegradation of PCBs by rhizosphere organisms
  - ◆ Indicators of bioremediation success
- 

# *HSRC Program: 2001-2006*

- ◆ South and Southwest HSRC
  - Outreach for EPA Regions 4 and 6
  - Research focuses on contaminated sediments
  - University partners
    - ◆ Louisiana State University
    - ◆ Georgia Tech
    - ◆ Rice University
    - ◆ Texas A&M

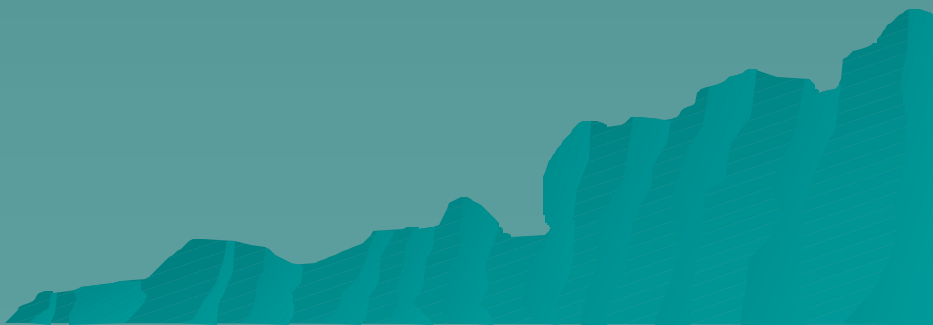
# *Current South/Southwest HSRC projects*

- ◆ Bioavailability of recalcitrant contaminants in sediments
  - ◆ Contaminant release from sediments during dredging
  - ◆ TNT degradation by plants
  - ◆ Design of “active” sediment caps
- 

# *HSRC Program: 2001-2006*

- ◆ Rocky Mountain HSRC
  - Outreach for EPA Region 8
  - Research focuses on mining issues
  - University partners
    - ◆ Colorado State University
    - ◆ Colorado School of Mines
    - ◆ Montana Tech

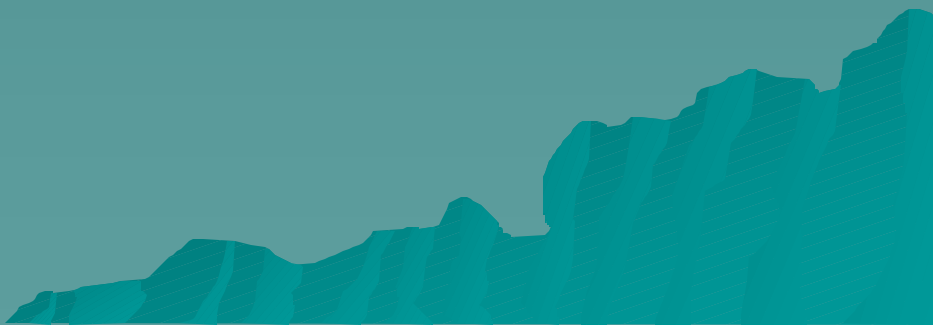
## *Current Rocky Mountain HSRC projects*

- ◆ Transport and transformation of arsenic and selenium
  - ◆ Fate and transport of mining wastes in surface water
  - ◆ Bioreactor treatment systems for mining waste
  - ◆ Natural recovery from heavy metal pollution
- 

# *HSRC Program: 2001-2006*

- ◆ Western Region HSRC
  - Outreach for Regions 9 and 10
  - Research focuses on VOCs in groundwater
  - University partners
    - ◆ Oregon State University
    - ◆ Stanford University

## *Current Western Region HSRC projects*

- ◆ Anaerobic bioremediation of PCE and TCE
  - ◆ Aerobic transformation of TCE
  - ◆ Use of palladium catalysts for groundwater remediation
  - ◆ Site characterization of groundwater contamination
  - ◆ Optimization of redox conditions for TCE remediation
- 

# *Other Government Partners*

- ◆ Department of Defense
  - ◆ Department of Energy
  - ◆ Department of Transportation
  - ◆ State Environmental Regulatory Agencies
- 

# *Outreach Program*

- ◆ TOSC – Technical Assistance to Communities
- ◆ TAB – Technical Assistance to Brownfields Communities
- ◆ TOSNAC – Technical Assistance to Native American Communities

# *Outreach - TOSC*

- ◆ **T**echnical **O**utreach **S**ervices for **C**ommunities
- ◆ Independent, unbiased technical assistance
  - Technical document review and interpretation
  - Laymen workshops and short courses
  - Link to MHSRC technical assistance materials and people...publications, videos, and web sites
  - Facilitation and conflict resolution among stakeholders
  - Program adapts to meet needs of community

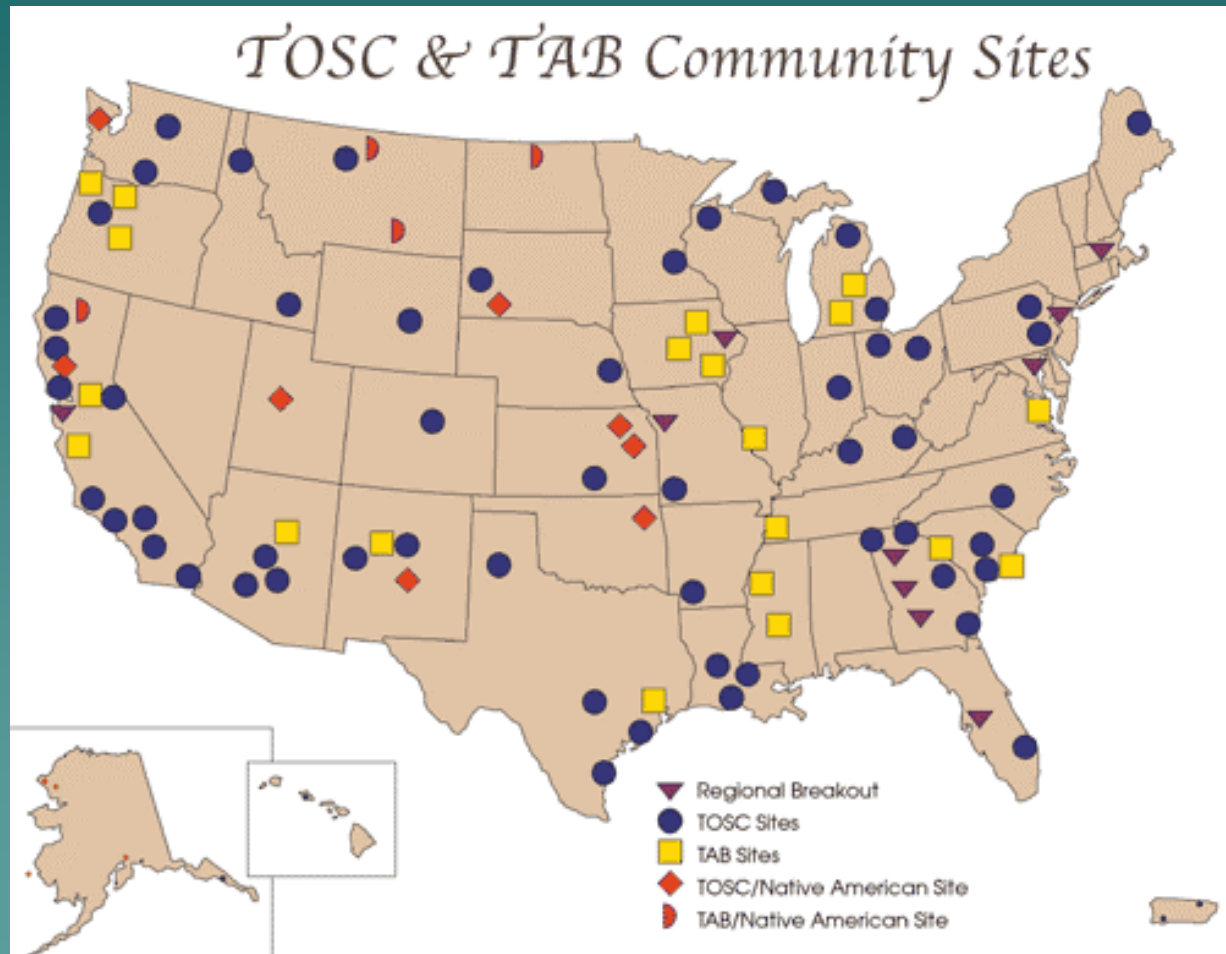
# *Outreach - TAB*

- ◆ TAB – **T**echnical **A**ssistance to **B**rownfields
- ◆ TAB provides assistance to communities and municipalities affected by Brownfields
  - Training, land use planning assistance, risk assessment, document review/interpretation

# Outreach - TOSNAC

- ◆ **T**echnical **O**utreach **S**ervices for **N**ative **A**merican **C**ommunities
- ◆ Similar to TOSC, except focused on Native American communities
- ◆ National program through Haskell Indian Nations University

# Outreach – Site Locations



# Outreach Program

## GRAND CALUMET SEDIMENT PROJECT

- ◆ Major dredging of Grand Calumet River will be conducted over the next five years (more than 2 million cubic yards) for both navigational and environmental purposes. The river runs through a densely populated urban setting in northwest Indiana (Cities of Gary, Hammond and East Chicago).
- ◆ The Army Corps of Engineers has selected a site to construct a confined disposal facility (CDF) for sediment storage/disposal in East Chicago one-half mile from a high school.
- ◆ TOSC awarded a grant from EPA's Great Lakes Office to provide support to local stakeholder groups. The Grand Calumet Task Force, a local community organization, is subcontractor to TOSC on grant.

# Outreach Program

In this project, the HSRC will address:

- ◆ Dredging technology selection, especially the issue of mechanical vs. hydraulic dredging (Louis Thibodeaux or Danny Reible as lead).
- ◆ Human health risk assessment during placement of sediments into CDF.
- ◆ Ecological risk assessment, concerning resuspension of sediment contaminants during dredging (Diane Henshel, IU-Bloomington as lead).
- ◆ Review of CDF design considerations (Milind Khire, MSU Civil and Environmental Engineering as lead).
- ◆ Application of natural treatment technologies (e.g., phytoremediation, bioremediation) for sediments placed into CDF, particularly for reducing toxicity of PAHs and PCBs (Clatyon Rugh, MSU as lead).

# *Technology Transfer Program*

- ◆ Mission: To disseminate technological knowledge gained through the Center research and outreach programs
- ◆ Accomplished through:
  - Conferences and short courses
  - Web sites ([www.mhsrc.org](http://www.mhsrc.org))
  - Fact sheets and brochures
  - Partnership with ITRC

# *ITRC and HSRC Partnerships*

- ◆ Unbiased peer review
  - ◆ Workshop instructors
  - ◆ Specialty team members
  - ◆ Link to state agencies
  - ◆ Cutting edge technology transfer
  - ◆ Access to proof-of-concept data
  - ◆ Student training
  - ◆ Facilitate research opportunities
- 