



# **EPA's Modeling Community of Practice and Interagency Steering Committee on Multimedia Environmental Modeling**

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**Ecosystems Research Division  
National Exposure Research Laboratory  
Office of Research and Development  
U.S. Environmental Protection Agency**

**U.S. Department of Energy's  
Performance Assessment Community of Practice Technical Exchange  
Atlanta, Georgia  
May 24-25, 2011**

Office of Research and Development  
National Exposure Research Laboratory, Athens GA

May 31, 2011

# Communities of Practice are . . .

*Groups of people who share a concern, set of problems, or passion about a topic and deepen their knowledge by interacting on an ongoing basis*



Etienne Wenger, E., R.McDermott, and B. Snyder. 2002. *Cultivating Communities of Practice*, Harvard Business School Press, 2002  
From S.R. Carter. 2009. *The Community of Practice: Theory and Application*, presentation in Geneva, Switzerland. AAAS Fellow, U.S. EPA.



# Agency Priority

“EPA is currently working to strengthen the use of **integrated modeling** to improve its ability to tackle complex issues with scientific rigor and integrity....Many of the complex environmental issues that we face would benefit from the **multi-media** and **multidisciplinary analysis** provided through an **integrated modeling** approach.”



Dr. Paul Anastas  
EPA ORD AA  
March 4, 2010

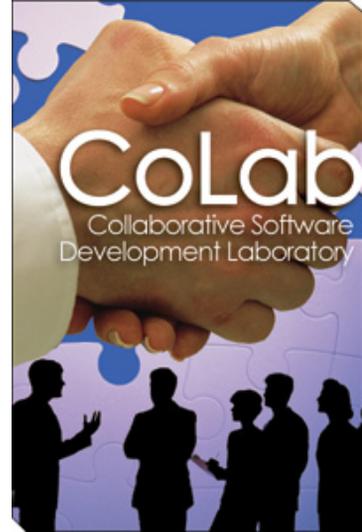
“Only by implementing **systems thinking** and **integrative approaches** to complement our traditional single discipline approaches, will we be better able to solve these challenging problems.”



Lisa P. Jackson  
EPA Administrator  
April 21, 2009



# Consortium Collaborations



**Community of Practice for Integrated Environmental Modeling (CIEM)**

**Consortium of Universities for the Advancement of Hydrologic Science, Inc.**



universities allied for water research





Online community resource that supports the development, evaluation, and application of environmental models, databases, and frameworks

Share and Access Tools and Documentation  
Interactive Tool Repository  
Manuals, Tutorials, and Online Presentations

Ratings and Citations

Content Tagging

Member Collaboration

Member Directory

User Groups for Private Collaboration

Wikis and Blogs

News and Events

Usage Metrics

**CONTRIBUTE TO IEMHUB**

- Create a Group
- Write a Topic page
- Upload a Resource
- SVN Repository (iemForge)
- Discussion Forum

**FIND CONTENT BY TAGS**

- Popular Tags: CIEM | Integrated Environmental Modeling | IEMSS | ISCMEM | iem summit | summit | integrated modeling | virtual basin | FRAMES | Pathogen Model | Modeling Frameworks | iemHUB | VB | VB2 | EPA | FRAMESV2 | ecosystem services | ecosystem services | Ecosystem Services | OpenMI | software | ecosystem ecological modeling | Regression Model | CIEM | Modeling Frameworks

Datasets, Documentation, Exhibits, Models, Publications and Presentations, Tools, Training and Course Material... All Categories >

**Jobs/Post Openings**

**JOBS**  
New/Post Openings

**OPEN POLL**  
Cast your votes and vote in the latest open poll

**ANNOUNCEMENTS**

Grant Announcement: Research Coordination Networks (RCN)  
20 Apr 2011  
The National Science Foundation is accepting proposals under the Research Coordination Networks ...  
[Read more...](#)

**IEMHUB VIDEOS**



iemHUB: How to contribute a Downloadable Tool

**FEATURED TOOLS**

- FRAMES, Earth Domain, iemWatersheds Domain
- Virtual Beach Model Builder 2

**COLLABORATIVE GROUPS**

- IEM Summit Project Proposals
- ISCMEM

**WHAT'S NEW IN RESOURCES**

An integrated modeling system for environmental impact analysis of climate variability and extreme weather events in the San Joaquin Basin, California  
in Publications and Presentations, Apr 12, 2011

CIEM Charter version 2.2  
in Documentation, Apr 12, 2011

Synthesis of Day 2 Discussions: Science, Technology, Application, Organizational  
in Documentation, Apr 07, 2011

Workshop Report v0.5  
in Publications and Presentations, Apr 01, 2011

[See what else is new >](#)



# Federal Collaborations



U.S. DEPARTMENT OF  
**ENERGY**



PACIFIC  
NORTHWEST  
NATIONAL  
LABORATORY  
RICHLAND CAMPUS

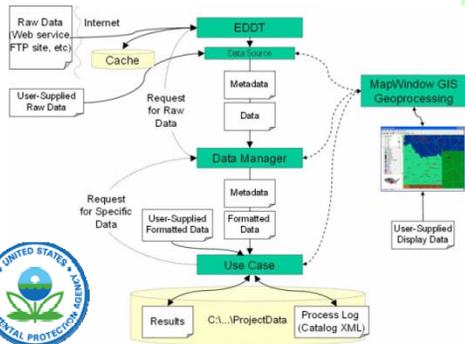


United States Department of Agriculture  
Agricultural Research Service  
The in-house research arm of the U.S. Department of Agriculture





# IEM Framework Collaborations



## Data for Environmental Modeling (D4EM)



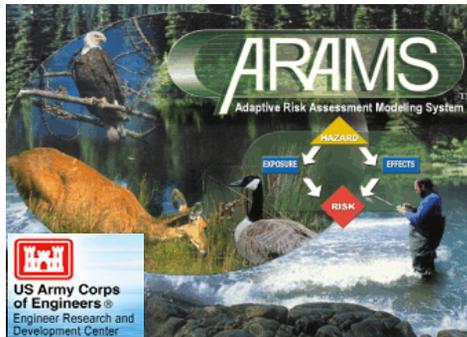
**SuperMUSE**

400 PCs (Dual Core+)  
1300+ GHz (Single-threaded Ops)  
2500+ GHz (Multi-threaded Ops)\*

## Object Modeling System (OMS)

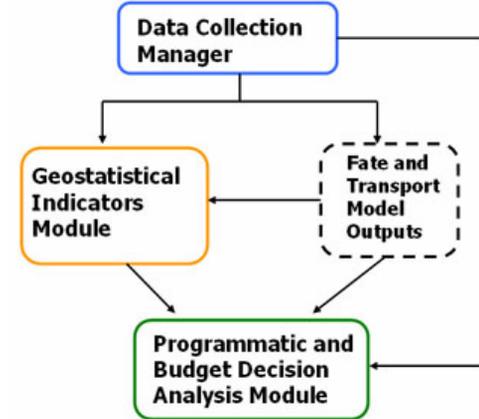


United States Department of Agriculture  
Agricultural Research Service  
The in-house research arm of the U.S. Department of Agriculture



The University of Vermont

**GUND INSTITUTE FOR ECOLOGICAL ECONOMICS**



**Multi-criteria Integrated Resource Assessment (MIRA)**



**OpenMI**

**ARIES MIMES**

**FRAMES:**  
Framework for Risk Analysis in  
Multimedia Environmental Systems  
(Version 2.x)

**Battelle**  
The Business of Innovation



## BASINS



**Envision version 5**



An analysis framework for policy-driven  
alternative futures analyses

# Recent Activities

- International iemSummit in Washington, DC (December 2010)
  - 25 national and international organizations
  - 15 proposed collaborative projects
  - Workshop Summary
  - IEM Roadmap (Strategic Plan)
  - iEMSs Journal Article on the iemSummit
- iEMSs Board of Directors and Peer Reviewers
- CIEM Organizational Committee
- iemHUB Organizational and Development Committees
- ISCMEM Steering Committee and Working Group Chairs



# Interagency Steering Committee on Multimedia Environmental Modeling (ISCMEM)

- Formed in 2000
- Nine Federal Agencies
- Coordinates IEM across Federal Agencies through an MOU
- National/International Workshops
  - *Environmental Software Systems Compatibility and Linkage Workshop*
  - *Uncertainty, Sensitivity, and Parameter Estimation for Multimedia Environmental Modeling*
  - *Conceptual Model Development for Subsurface Reactive Transport Modeling of Inorganic Contaminants, Radionuclides, and Nutrients*
  - *International iemSummit in Washington, DC*
- Steering Committee and 6 Working Group



# ISCMEM Workgroups

1. Software Systems Design and Implementation for Environmental Modeling
2. Uncertainty Analysis and Parameter Estimation
3. Subsurface Reactive Solute Transport Modeling
4. Distributed Watershed / Water Quality Modeling
5. Environmental Forecasting (Ecosystem Services)
6. Integrated Monitoring and Modeling (developing)

# Summary

- Tailor tools to problem; do not tailor problem to meet the assumptions of the tools
- No one model or system/framework addresses the needs of all problems
- Use the IEM “Communities” of Community of Practice to build upon their successes