

# THE IMPORTANT RELATIONSHIP BETWEEN MONITORING AND MODELING



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National Environmental Monitoring Conference  
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# We need to ...

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- Support more collaborative engagement both internally and externally;
- Leverage all Agency data by establishing a framework to move towards registering all Agency data in an Agency catalogue; and
- Use modeling techniques and monitoring data through tools, such as integrated modeling and geospatial analysis, to address complex problems.

# Overview

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- General Information
  - ▣ Office of the Science Advisor
- Measurement, Monitoring, Modeling (M<sup>3</sup>) Group
  - ▣ Council for Regulatory Environmental Modeling
  - ▣ Forum on Environmental Measurements
- Partnerships
- Summary
- Contact Information

# Measurement, Monitoring, Modeling (MMM or M<sup>3</sup>) Group

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- Council for Regulatory Environmental Modeling (CREM)
- Environmental Laboratory Advisory Board (ELAB)
- Forum on Environmental Measurements (FEM)
- EPA Global Earth Observations (GEO)
  - ▣ Currently inactive

# Council for Regulatory Environmental Modeling (CREM)

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*Information about the CREM and the programs it supports is subject to change, as the new Council gets underway.*

- ***New Council Established:*** March 2012
- ***Purpose and Scope:***
  - ▣ Promote consistency and consensus within the EPA on mathematical modeling issues including modeling guidance, development, and application.
  - ▣ Enhance internal and external communication on modeling activities.
  - ▣ Create consistent – yet flexible – modeling tools, training, and guidance to support environmental decision making.
- ***Vision:*** Under development

# CREM – Areas of Focus

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- ***Standardization of Issues Common to All Models / Integrated Modeling:***
  - ▣ Develop model interoperability standards and approaches.
- ***Common Policy on Model Use / Intra-agency Coordination:***
  - ▣ Create an inventory of modeling needs and best practices to foster collaborative engagement and broadened applicability within and across modeling classes at EPA.
- ***Transparency of Model Decisions / Model Transparency:***
  - ▣ Convene routing internal and external forums to discuss modeling approaches.
- ***Shared Learning / Modeling Expertise:***
  - ▣ Collaborate with other groups to develop a suite of guidance and training materials.

# Forum on Environmental Measurements (FEM)

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- **Purpose:** Promote consistency and consensus on measurement methodology, monitoring, technology, and laboratory science issues with multi-program impact.
  
- **Scope:**
  - ▣ Validate and disseminate methods for sample collection and analysis.
  - ▣ Ensure monitoring studies are scientifically rigorous and statistically sound.
  - ▣ Employ a quality systems approach to ensure data gathered/used is of known and documented quality.

# FEM Areas of Focus

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- ❑ Improving the Quality of Agency Methods
- ❑ Implementation of the Performance Approach
- ❑ Communication/Outreach
- ❑ Method Detection/Quantitation and Calibration
- ❑ General Laboratory Competency
- ❑ National Environmental Accreditation
- ❑ National Environmental Monitoring Conference
- ❑ Monitoring, Information, Technology, and Opportunities Resources (MonITOR)
- ❑ Data Management



# Modeling Perspective

*Information about the CREM and the programs it supports is subject to change, as the new Council gets underway.*

- **Budget and resource constraints** require better alignment and coordination of our capabilities and elimination of redundancies.
- Environmental and human health problems are rarely media specific. An **integrated, holistic, and systems thinking** approach is needed to inform effective sustainable policies and management decisions.
- A **suite of scientific tools** are often used to inform decision making, like monitoring data, modeling, and geospatial analyses.

# Monitoring Perspective

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- Support more **method development**, so we can readily implement state-of-the-art monitoring technology to solve environmental problems.
- Establish a consistent **framework to register all Agency data** in an Agency catalogue; and
- Consistently apply the data life-cycle, and **increase data quality**, to create greater confidence in the reliability of data and greater insurance of its appropriate use.
- Leverage internal and external partnerships to fill data gaps and needs due to **resource limitations**.

# External Modeling Information

Information about the CREM and the programs it supports is subject to change, as the new Council gets underway.

The **Models Knowledge Base** is an inventory of the computational models that are developed, used, or supported by EPA's offices.

<http://www.epa.gov/crem/knowbase/index.htm>

U.S. ENVIRONMENTAL PROTECTION AGENCY

Council for Regulatory Environmental Modeling

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You are here: [EPA Home](#) » [Office of the Science Advisor](#) » [Council for Regulatory Environmental Modeling](#) » [Models Knowledge Base](#) » [List of Models](#)

**List of Models**

Home Search & Retrieve

Overview List of Models Keyword Search Browse

Your search returned the following **145** models:

Sort by  Model Name  Update Date

Model	Update Date
<a href="#">AIR 3D</a>	11/23/2009
<a href="#">AQUATOX (AQUATOX.)</a>	06/24/2010
<a href="#">AirControlNet</a>	08/31/2009
<a href="#">ATTILA (Analytical Tools Interface for Landscape Assessments)</a>	11/16/2009
<a href="#">ADAGE (Applied Dynamic Analysis of the Global Economy)</a>	04/29/2011
<a href="#">ARAMS (Army Risk Assessment Modeling System)</a>	11/16/2009
<a href="#">ASTER (Assessment Tools for the Evaluation of Risk)</a>	11/16/2009
<a href="#">AOM (Atmosphere-Ocean Model)</a>	11/16/2009

# External Method Information

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The **Test Method Collections** links to approved Agency test methods.

<http://www.epa.gov/fem/methcollectns.htm>

Method Collections | Measurement Science | Office of the Science Advisor | US EPA



The screenshot shows the EPA website's "Forum on Environmental Measurements" page. At the top, it features the EPA logo and the text "U.S. ENVIRONMENTAL PROTECTION AGENCY Forum on Environmental Measurements". Below this is a navigation bar with links for "Recent Additions", "Contact Us", and a search function. A breadcrumb trail indicates the current location: "You are here: EPA Home » Office of the Science Advisor » Measurement Science » Method Collections". The main heading is "Test Method Collections", followed by a paragraph stating the site's purpose: "This site is maintained by EPA's Forum on Environmental Measurements as a service to the environmental analytical community." Below this, there are two main sections: "EPA Method Collections" and "Solid Waste and Emergency Response". The "EPA Method Collections" section includes a sub-heading "Air and Radiation" with a list of links: "Source Emission Methods", "Source Continuous Emission Monitoring Performance Specifications", "Ambient Monitoring Methods", "Mobile Source Methods", and "Radiation Methods". The "Solid Waste and Emergency Response" section includes links for "Office of Solid Waste Methods Team" (with a sub-link for "SW-846 On-line Test Methods for Evaluating Solid Waste Physical/Chemical Methods"), "Petroleum Hydrocarbons - (Underground Storage Tanks)", and "Contract Laboratory Program (CLP) Methods". On the left side of the page, there is a vertical navigation menu with links for "OSA Home", "FEM Home", "Areas of Focus" (Quality of Agency Methods, Performance Approach, Technical Assistance, Method Detection/Calibration, Laboratory Competency, National Env Accreditation), "NEMC", "Environmental Technology", "Links", and "Methods".

Method Collections | Measurement Science | Office of the Science Advisor | US EPA

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You are here: [EPA Home](#) » [Office of the Science Advisor](#) » [Measurement Science](#) » [Method Collections](#)

## Test Method Collections

This site is maintained by EPA's [Forum on Environmental Measurements](#) as a service to the environmental analytical community.

Test methods are approved procedures for measuring the presence and concentration of physical and chemical pollutants; evaluating properties, such as toxic properties, of chemical substances; or measuring the effects of substances under various conditions.

### EPA Method Collections

#### Air and Radiation

- [Source Emission Methods](#)
- [Source Continuous Emission Monitoring Performance Specifications](#)
- [Ambient Monitoring Methods](#)
- [Mobile Source Methods](#)
- [Radiation Methods](#)

#### Solid Waste and Emergency Response

- [Office of Solid Waste Methods Team](#) - including [SW-846 On-line Test Methods for Evaluating Solid Waste Physical/Chemical Methods](#)
- [Petroleum Hydrocarbons - \(Underground Storage Tanks\)](#)
- [Contract Laboratory Program \(CLP\) Methods](#)

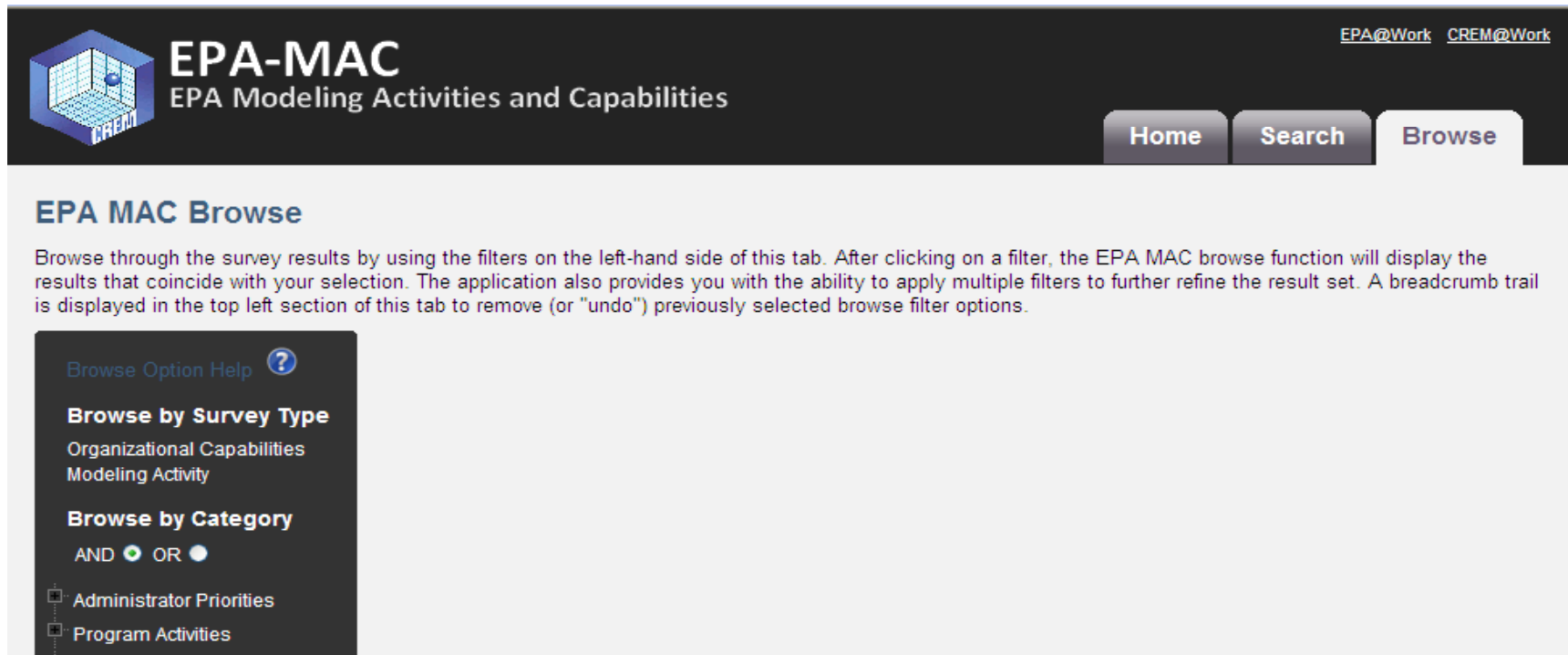
OSA Home  
FEM Home  
Areas of Focus  
  Quality of Agency Methods  
  Performance Approach  
  Technical Assistance  
  Method Detection/Calibration  
  Laboratory Competency  
  National Env Accreditation  
NEMC  
Environmental Technology  
Links  
Methods

# Internal Modeling (Method) Information

*Information about the CREM and the programs it supports is subject to change, as the new Council gets underway.*

The **EPA-MAC** provides access to information about the Agency's modeling (method) capabilities and activities being conducted across the Agency's offices.

<http://intranet.epa.gov/ord/epamac>



The screenshot displays the EPA-MAC website interface. At the top left is the EPA-MAC logo, which consists of a blue 3D grid with a globe in the center and the text 'EPA-MAC' and 'CREM' below it. To the right of the logo is the text 'EPA-MAC' in large white font, followed by 'EPA Modeling Activities and Capabilities' in smaller white font. In the top right corner, there are two links: 'EPA@Work' and 'CREM@Work'. Below the header are three buttons: 'Home', 'Search', and 'Browse'. The main content area is titled 'EPA MAC Browse' and contains a paragraph of text explaining how to use the filters. On the left side, there is a dark sidebar with the following elements: 'Browse Option Help' with a question mark icon, 'Browse by Survey Type' with two sub-items: 'Organizational Capabilities' and 'Modeling Activity', 'Browse by Category' with two radio buttons labeled 'AND' and 'OR', and two checkboxes labeled 'Administrator Priorities' and 'Program Activities'.

# Internal Monitoring Information

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Design and implement an Agency Monitoring Structure consisting of databases and collaborative engagement opportunities to capture and meet monitoring data gaps and needs across the Agency.



# Integrated Modeling

*Information about the CREM and the programs it supports is subject to change, as the new Council gets underway.*

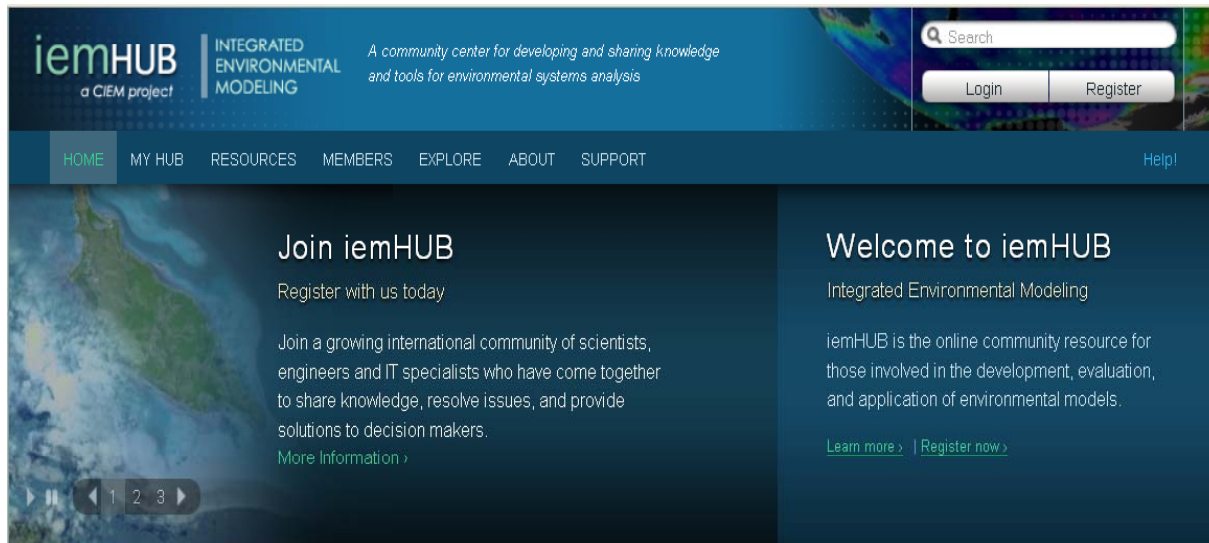


- **As we implement a sustainability-focused approach, we will need to adopt a systems perspective:**
  - Predict impacts of drivers like climate and land-use change
  - Analyze cross-sectoral processes and impacts
  - Analyze combined effects of exposure to multiple stressors

# Integrated Modeling (cont.)

Information about the CREM and the programs it supports is subject to change, as the new Council gets underway.

**Community of Practice for Integrated Environmental Modeling:** providing access to a diverse range of scientists and tools across EPA, Federal Agencies and internationally.



## FEATURES:

- Model / Tool Repository
- Documents Library
- Training / Technical Support Tools
- Community Support Forum

**iemHUB:** *Collaboration Resource for the Environmental Modeling Community*

<http://www.iemhub.org>





# Data Management

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- **Problem:**

- Multiple databases, processes, procedures, and methods.

- **Need:**

- Consistent data management system.

- **Tasks:**

- Create inventory, identify commonalities, and leverage opportunities.

# Partnerships

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## □ **Internal:**

- Councils (e.g., CREM, FEM)
- Advisory Committee (e.g., ELAB)
- Program Offices (e.g., OEI)

## □ **External:**

- Other Federal Agencies (e.g., DoD, USGS, NIST)
- Private Sector Entities

## In summary, we need to...

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- Support more collaborative engagement both internally and externally;
- Leverage all Agency data by establishing a framework to move towards registering all Agency data in an Agency catalogue; and
- Use modeling techniques and monitoring data through tools, such as integrated modeling and geospatial analysis, to solve complex problems that span the environmental, social, and economic sectors.

# Contact Us . . .

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  - <http://www.epa.gov/fem>
  - <http://www.epa.gov/crem>

