



The Federal and State Response to Emerging Contaminants

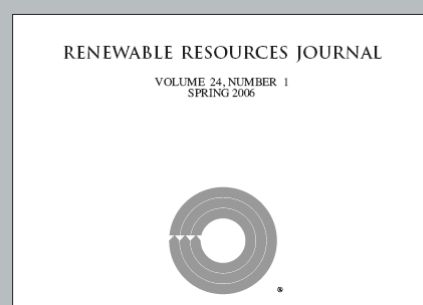
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Society for Risk Analysis Annual Meeting
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Outline

- An interest in emerging contaminants
- Research statement
- Defining emerging contaminants (ECs)
- A risk based response paradigm
- Federal departments and agencies
 - CDC
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 - EPA
 - NASA
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- State programs
 - Massachusetts
 - ECOS
- Conclusions

Interest in Emerging Contaminants



Inside EPA's Superfund Report
 Exclusive coverage of waste management and cleanup regulation, legislation and politics
 Vol. XXII, No. 13 — February 11, 2008

Democrats May Ignore Bush's Steep Cuts To EPA FY09 Budget
 Democratic lawmakers and others are harshly criticizing President Bush's plan to cut EPA's budget by \$330 million in fiscal year 2009, to \$7.14 billion — the lowest requested funding level since 1997, according to a state source — prompting suggestions that Congress will ultimately ignore the president's budget request by funding the agency through a continuing resolution until a new administration takes office in early 2009. The budget includes a \$20.8 million cut for the leaking underground tanks program, compared to FY08 enacted levels, and also cuts funding for brownfields and Superfund cleanup. Special Issue Focus: Budget, stories begin on Page 2.

Boxer Concedes Insufficient Support For Reinstating Superfund Tax
 Senate Environment & Public Works Committee Chairwoman Barbara Boxer (D-Calif.) is conceding that she likely does not have the necessary 60 votes to support reinstating the Superfund tax, but says she is working on building support among senators and that it remains an environment panel priority this year despite her committee's crowded agenda. Boxer told reporters she is preparing to introduce a Superfund tax bill, but is working on it, Boxer added. (ENR.com) Page 7.

DOD Plans To Cut 'Emerging Contaminants' Risk Within Seven Years
 The Defense Department (DOD) has developed a plan to lower exposure levels within seven years for a group of so-called high risk emerging contaminants that, if left unabated, could carry significant health liability for the military. Lowering their risk will require a combination of measures, including reducing use and release, a DOD source says. (ENR.com) Recently, DOD added benzyl and perfluorooctanoic acid to its "toxic" list of emerging contaminants — a list that already includes perchlorate, the explosive compound dicyclopentadiene/dinitrodiphenyl ether, the solvent tetrachloroethylene, hexavalent chromium and epichlorohydrin. (ENR.com) Page 10.

Wynn Touts Environmental Strength In Close Election Primary Race
 Rep. Albert Wynn (D-Md.), chairman of a key House Energy & Commerce Committee panel, is bolstering his seniority while seeking to bolster his environmental record in his campaign to defeat a primary rival who won endorsements from the League of Conservation Voters and the Sierra Club. Wynn's campaign says the lawmaker's seniority enables him to help secure passage of key legislation, including a bill banning mercury exports and another strengthening environmental justice, whereas his challenger, Donna Edwards, would not be able to play such a role. (ENR.com) Page 13.

Waste Policy Alert

EPA Weighs RCRA Relief
 EPA is considering whether to grant submitters broader relief from costly Resource Conservation & Recovery Act (RCRA) hazardous waste regulations from a process used to boost vehicle fuel economy by replacing steel components with aluminum, which weighs less. Page 2.

Settlement Bolsters Lead Role
 A recent settlement of a key antitrust case bolsters efforts to secure a final EPA rule aimed at limiting children's exposure to lead dust generated by renovation work and adds their own to ensure that the agency includes nonresidential structures frequented by children in the scope of buildings governed by the regulation, a lawyer involved in the case says. Page 18.

Lawmaker Seeks Waste Limits
 House Science & Technology Committee Chairman Bart Gordon (D-Tn.) is warning that the United States should solve its domestic capacity challenges for storing low-level radioactive waste before increasing its imports of the material for processing and disposal. Gordon is urging a regional state compact to dispose plans to import Italian waste. Page 23.

Environmental Impact of Emerging Contaminants

Consumer Alert
 Cancer-Causing 1,4-Dioxane Found in Personal Care Products Misleadingly Branded as Natural and Organic

A newly released study commissioned by the Organic Consumers Association (OCA) — a nationwide network of more than 200,000 organic consumers, and endorsed by environmental health consumer advocate David Steiman (author of *The Safe Shopper's Bible*), revealed the presence of the undisclosed carcinogenic contaminant 1,4-dioxane in leading shampoo, body washes, lotions and other personal care and household cleaning products claiming to be "natural" or "organic." Laboratory tests showed that products certified under the USDA National Organic Program did not contain this toxin. All leading self-proclaimed "organic" brands have at least a few individual "certified organic" ingredients, but for most of these top-selling brands, the product, as a whole, is not even organic certified, thereby allowing the presence of synthetic toxins.

WHAT IS 1,4-DIOXANE?
 Ethoxylates, a cheap short-cut companies use to provide mildness to harsh ingredients, requires the use of the cancer-causing petrochemical ethylene oxide, which generates 1,4-dioxane as a by-product. 1,4-Dioxane is considered a chemical "toxin" to the State of California to cause cancer under proposition 65, and is also suspected as a kidney irritant, neurotoxin and respiratory irritant, among others, according to the California Air Resources Board. You won't see 1,4-dioxane listed on product ingredient labels, because it is considered a "contaminant" or "by-product" of the ethoxylation process, rather than an ingredient. OCA's study identifies the toxin in personal care products with synthetic ethoxylated ingredients, including those with myristic, lauryl, lauroyl, cocoyl, any other "eth", "eao", polyethylene, polyethylene glycol, polypropylene, or "oxyl", in their names.

CONVENTIONAL NON-ORGANIC PRODUCTS ALSO CONTAIN THE CARCINOGEN
 Although previous studies have revealed 1,4-dioxane is present in many conventional personal care products, for the first time, this new study indicates the toxin is also present in a number of leading self-proclaimed-but-not-certified "natural" and "organic" branded products.

CONSUMER TIPS
 Remember that just because a personal care product label itself with the words "organic" or "certified organic" doesn't mean it meets any specified organic standards. Look for products that are certified under the USDA National Organic Program (or a similar German program) and products that bear the "True Organic" seal. Search product labels for ingredients with the following in their names to avoid products containing 1,4-dioxane: myristic, lauryl, lauroyl, cocoyl, any other eth, eao, polyethylene, polyethylene glycol, polypropylene, or oxyl. In general, avoid products with unpronounceable ingredients to be sure to avoid synthetic toxins and carcinogens.

SOME OF THE LEADING BRANDS FOUND TO CONTAIN 1,4-DIOXANE
 • Jason Pure Natural & Organic
 • Giovanni Organic Cosmetics
 • Kim My Face
 • Nature's Gate Organics

BRANDS FOUND NOT TO CONTAIN 1,4-DIOXANE
 All OCA Certified brands used in this study were 1,4-dioxane-free including:
 • Dr. Bronner's
 • Seventh Generation (Household Cleaners)
 • TruNatural
 • German Natural "True" Certified brands avoid and avoid to be a dioxane-free.
 • Aubrey Organics
 • Dr. Hauschka

MORE INFORMATION
 Join the more than 200 companies and thousands of consumers who support OCA's



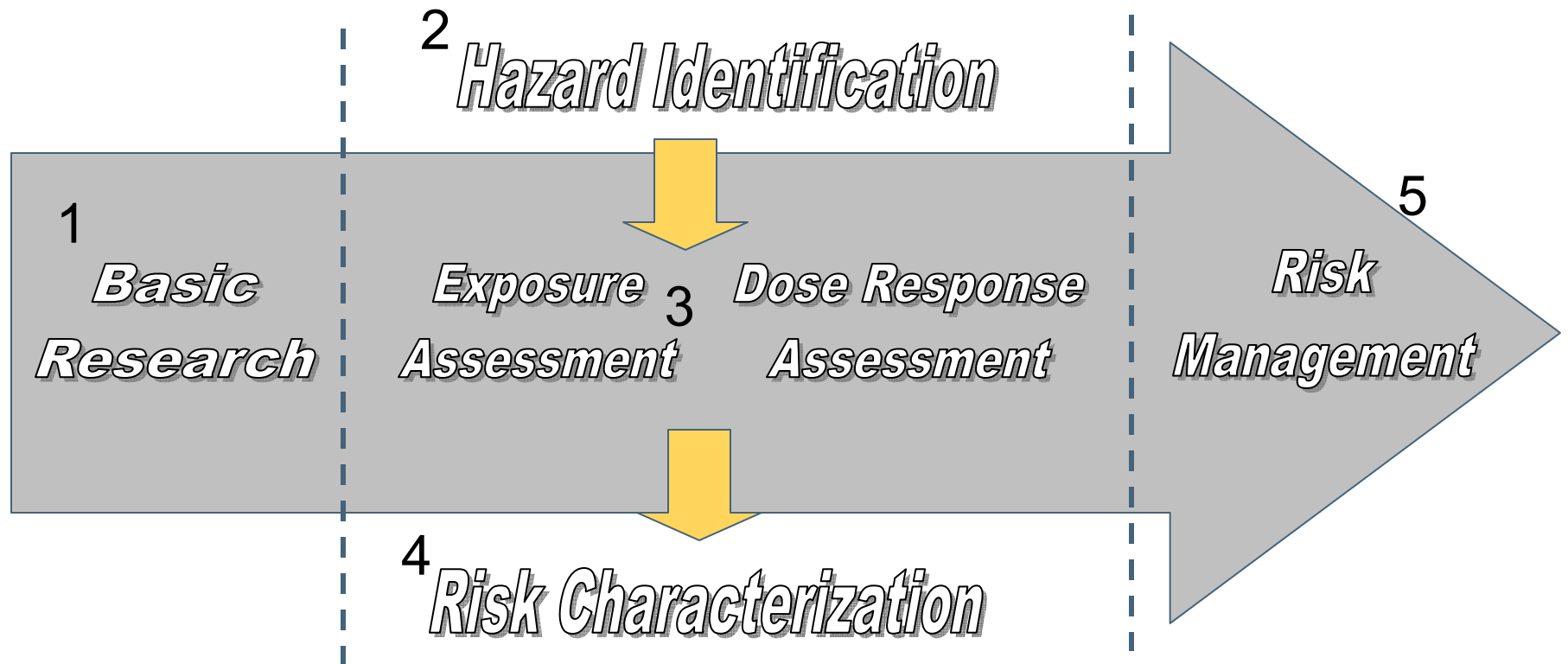
Research Statement

- Using a risk-based framework, evaluate the approaches of US Federal and state agencies/departments to address the problems raised by emerging contaminants

Materials and Methods

- Materials
 - Briefing charts
 - Interviews
 - Web sites
 - Literature
 - Regulatory rule makings (where applicable)
- Methods
 - Collected and synthesized data and ranked qualitatively on five elements
 - High ↑ Medium ↔ Low ↓

Risk-Based Response Paradigm

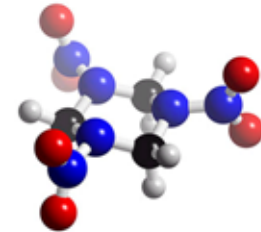


NAS, 1997

What is an Emerging Contaminant?

Acquisition, Technology and Logistics

- Chemicals & materials that have pathways to enter the environment and present potential unacceptable human health or environmental risks
and either
 - do not have regulatory peer-reviewed human health standards
 - or**
 - the regulatory standards are evolving due to new science, detection capabilities, or pathways.



DoD, 2008

Emerging Contaminants

are:

New substances, chemicals or metabolites, or microorganisms
or

Older chemicals

- newly expanded distribution or altered releases, or
- newly found in the environment and not commonly monitored
- newly recognized or poorly known effects



Gerould, 2005

Definitions of Emerging Contaminants

- “...an emerging contaminant that was previously unregulated by any state or the federal government” – Massachusetts DEP
- Overall issues ranges from microbes, chemicals, metabolites depending on organizational focus
- Some do not recognize that they are addressing emerging contaminants

“A deleterious substance with less than a one-inch stack of re-prints” - unknown

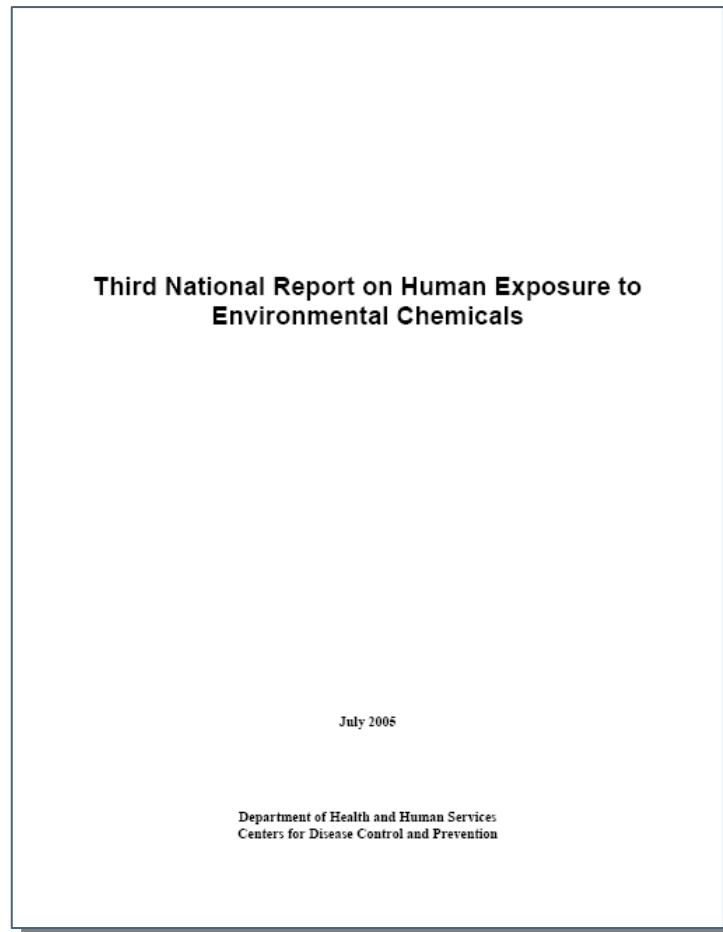
EC Examples – Past & Present

- **Ozone Depleting Substances** – Refrigerants, fire suppressants, solvents...phased out of production
- **Perchlorate** – Munitions/propellant oxidizer...highly water soluble...affects thyroid function...intense Congressional interest regarding DoD releases
- **Personal care products / Pharmaceuticals** – possible endocrine disruptors...subject of much press due to presence in finished drinking water
- **PFOA** – Formerly used to make fire retardant/high performance materials...bio-persistent....95% phase-out by 2010...100% by 2015
- **Naphthalene** – Component of JP-8/fuels used throughout DoD. Proposed “carcinogenicity” listing by EPA.
- **Sulfur Hexafluoride** – Global warming gas used in electrical and other essential applications

Federal Response / Compare Agencies

- CDC
 - Non-regulatory research focused; human health focused
- DOD / NASA
 - Non-regulatory with large R&D budget focused on ECs specific to applicable systems with special receptor populations
- EPA
 - Regulatory with moderate R&D budget, large human health focus, smaller ecological focus.
- Food and Drug Administration
 - Regulatory focused on human health; mostly in response
- NNI
 - Non-regulatory coordinating body
- National Toxicology program
 - Non-regulatory research focused – health effects
- USGS
 - Non-regulatory research focused – occurrence, fate, effects

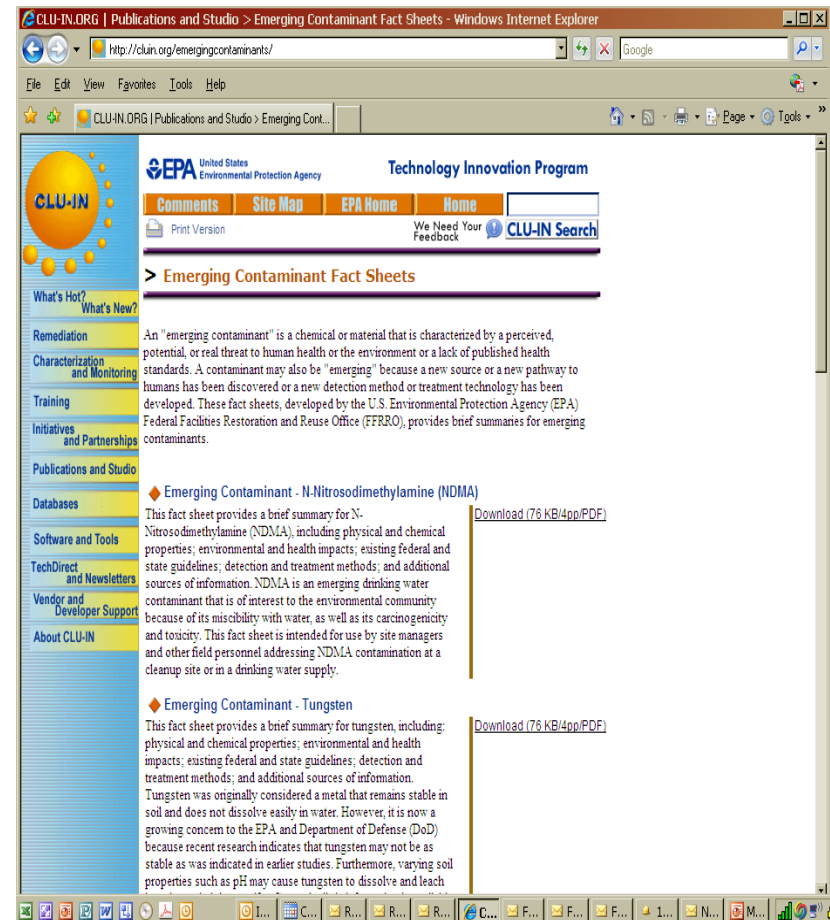
Centers for Disease Control and Prevention



- CDC's Environmental Health Laboratory at the National Center of Environmental Health
- Provides an ongoing assessment of the exposure of the U.S. population to environmental chemicals using biomonitoring
- Presents exposure data for the U.S. population for 148 environmental chemicals over the period 2001-2002

US Environmental Protection Agency

- Office of Research and Development
- Programs on identification and response
- Water quality (identification) – but driven by findings of USGS
- Moderately focused on assessment (in confines of other existing programs)



The screenshot shows a web browser window displaying the EPA Technology Innovation Program website. The page title is "Emerging Contaminant Fact Sheets". The left sidebar contains a navigation menu with items like "What's Hot?", "Remediation", "Characterization and Monitoring", "Training", "Initiatives and Partnerships", "Publications and Studio", "Databases", "Software and Tools", "TechDirect and Newsletters", "Vendor and Developer Support", and "About CLU-IN". The main content area features a definition of "emerging contaminant" and two fact sheets: "Emerging Contaminant - N-Nitrosodimethylamine (NDMA)" and "Emerging Contaminant - Tungsten". Each fact sheet includes a brief summary and a "Download (76 KB/4pp/PDF)" link. The browser's address bar shows the URL "http://clu-in.org/emergingcontaminants/".

National Nanotechnology Initiative

- National presidential level coordination office
- The management and response to nanomaterials is spread among several agencies
- Only example for a specific class of emerging contaminants across the US federal agencies

Table 2. Roles of NEHI Working Group Member Agencies with Regard to Nanotechnology-Related EHS Research Needs

◆ – Coordinating Agency ○ – Contributor □ – User

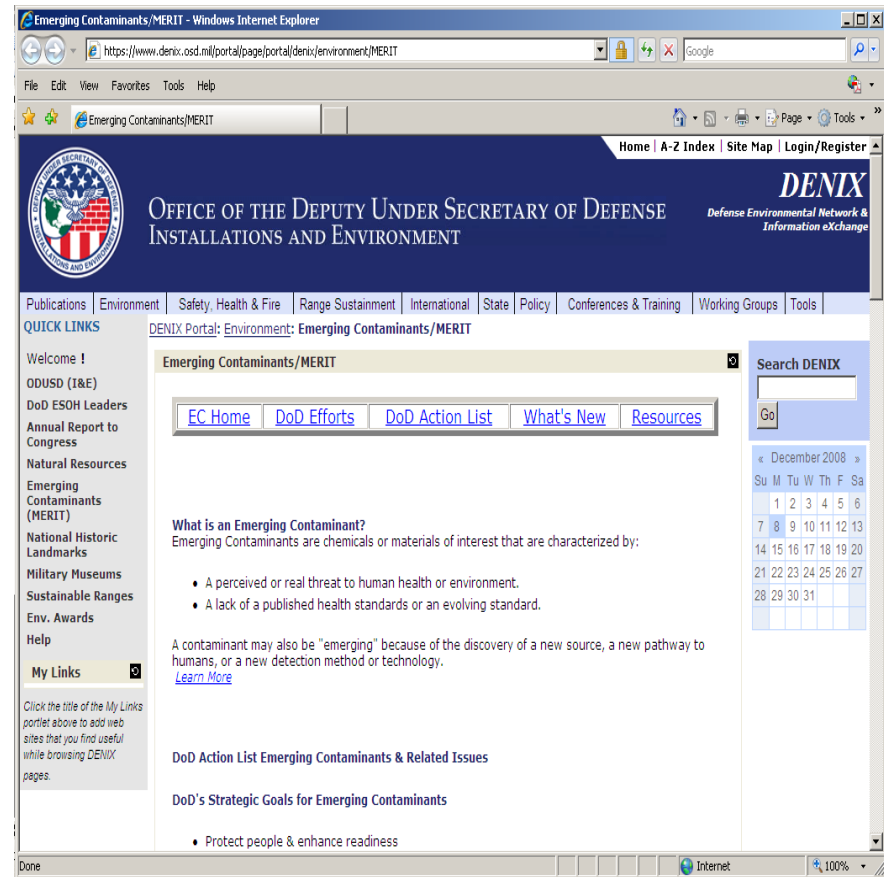
All coordinating agencies have roles as contributors to and users of the research from the respective categories, with the exception of FDA, which has the roles of coordinating agency and user.

Agency	Research Need	Instrumentation, Metrology, and Analytical Methods	Nanomaterials and Human Health	Nanomaterials and the Environment	Human & Environmental Exposure Assessment	Risk Management Methods
	NIH	○□	◆	□	□	
NIST	◆	○	○	○	○	
EPA	○□	○□	◆	○□	◆	
FDA	□	□	□	□	◆	
NIOSH	○□	○□	○	◆	○□	
NSF	○*	○*	○*	○*	○*	
DOD	□	□	○□	□	○□	
DOE	○□	□	○□	□	□	
USDA	□	○□	○□	□	□	
DOT		□	□	□	□	
OSHA	□	□		□	□	
CPSC	○□	□	□	○□	○□	
USGS	○□		○□	○□		

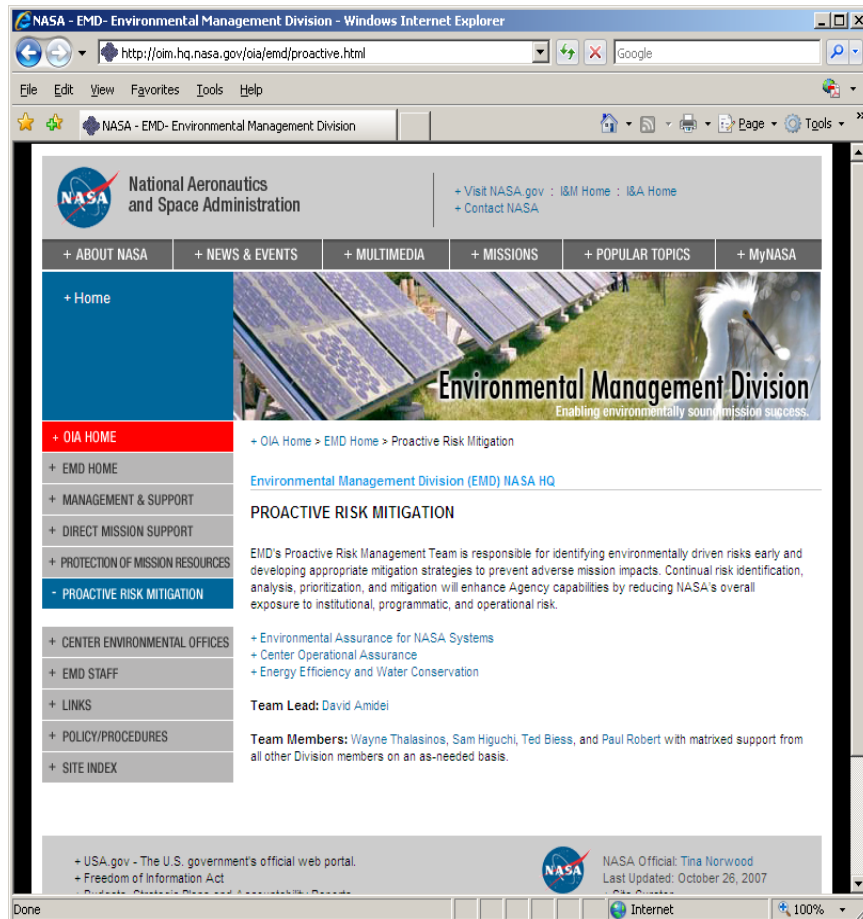
*NSF is a contributor according to the mission of the agency covering the upstream, fundamental research on utilization, implications, and risk mitigation of nanotechnology, infrastructure, and education.

Department of Defense

- Office of Deputy Under Secretary of Defense for Installation and the Environment, Emerging Contaminants Program
- Focused on issues specific to DoD acquisition/use/disposal of a material
- Started in response to perchlorate
- Focused on identification through risk management and solutions
- Given generally good marks in recent review by Government Accountability Office



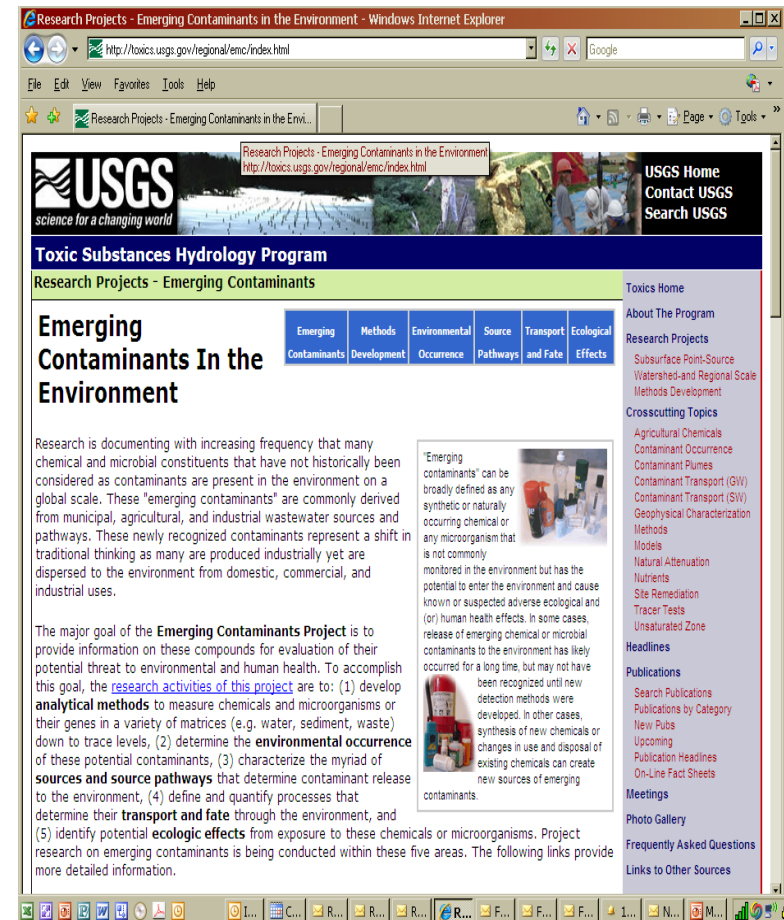
National Aeronautics and Space Administration



- Environmental Management Division, Proactive Risk Mitigation
- Part of a larger effort on materials management
- Continual risk identification, analysis, prioritization, and mitigation of materials risks
- Focus on site remediation

US Geological Survey

- Toxic Substances Hydrology Program
- Focused on identification and some level of assessment and effects
- Analytical methods development
- National level reconnaissance of occurrence in surface water, groundwater, sediment, and fish (2002)



Federal Assessment Summary

Scores Relative to Emerging Contaminants

Agency	R&D	ID	Assess	RC	RM/SoI
CDC	↔	↑	↔	↓	↓
EPA	↔	↔	↔	↓	↓
<i>FDA</i>	↔	↔	↔	↔	?
DoD	↓	↑	↑	↑	↔
NASA	↓	↑	↑	↑	↔
NNI	↑	↑	↔	↓	↓
NTP	↑	↔	↔	↔	↓
USGS	↑	↑	↑	↓	↓

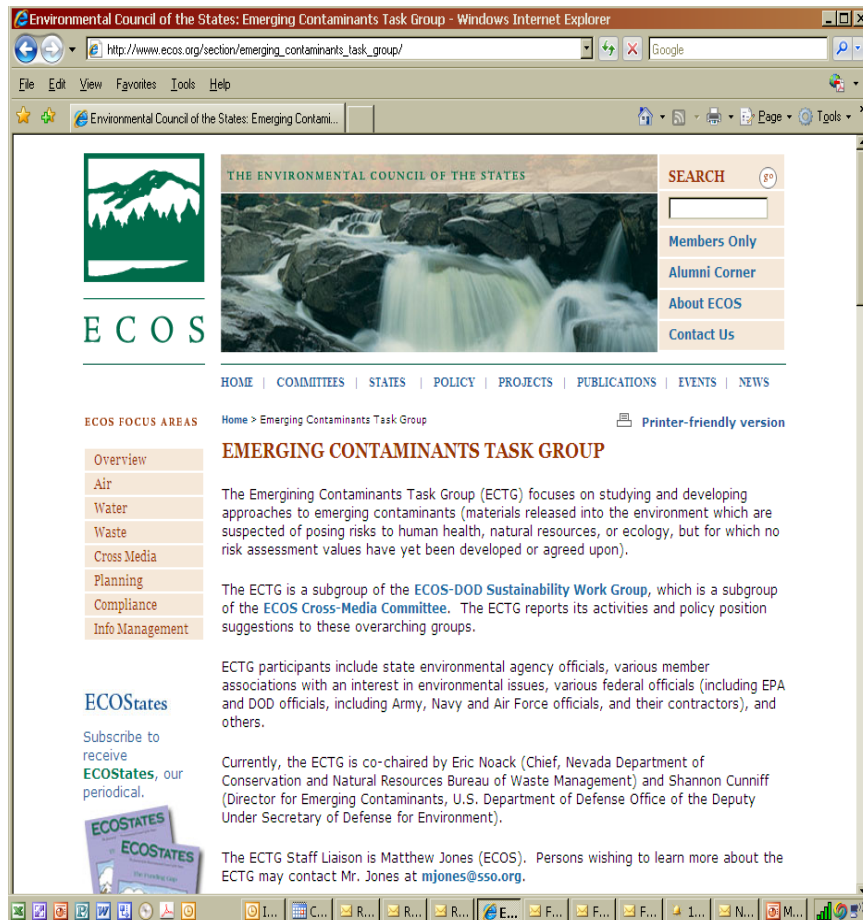
Italics indicate analysis incomplete

Massachusetts Response

- Department of Environmental Protection
- The goal is to identify and assess public health and environmental problems associated with presently unregulated contaminants, and to recommend agency strategies for managing these contaminants
- Addresses perchlorate and other emerging contaminants
- Mostly focused on drinking water standards
- Comprehensive from identification through solutions



Environmental Council of the States (ECOS)



- Part of a larger push towards sustainability
- State survey
- Working Group with DoD
- Resolutions to address
 - Triggers for remedial action
 - Risk communication
 - Absence of official toxicity values

Conclusions

- A comprehensive and risk-based approach is not apparent at the federal level
- Federal response to ECs is fractured
 - Identification (very)
 - Assessment (not really)
 - Risk Characterization (limited)
 - Risk Management/Solutions (limited)
- Three most complete emerging contaminants programs (DoD/NASA/USGS) are limited in scope
- State response appears robust in all areas, but metrics should be adjusted

Potential Next Steps

- Expand the number of federal agencies/departments examine
- Expand the number of programs within a federal agency/department
- Expand the number of state programs examined
- Initiate an examination of international standards organizations
- Foster cross fertilization of successful elements of each program – across all five elements
- Identify solutions

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