

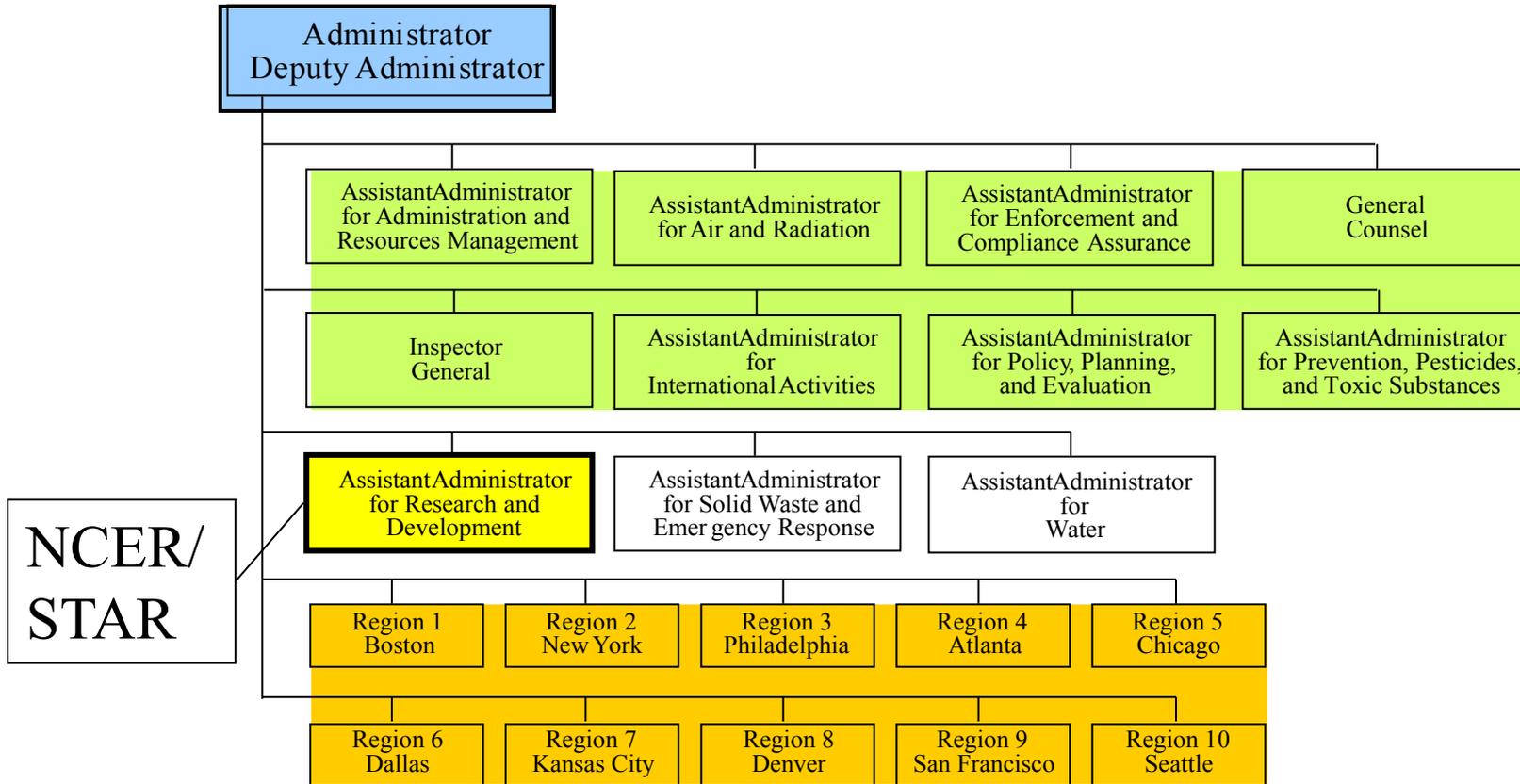
# NCER's Water Research Program

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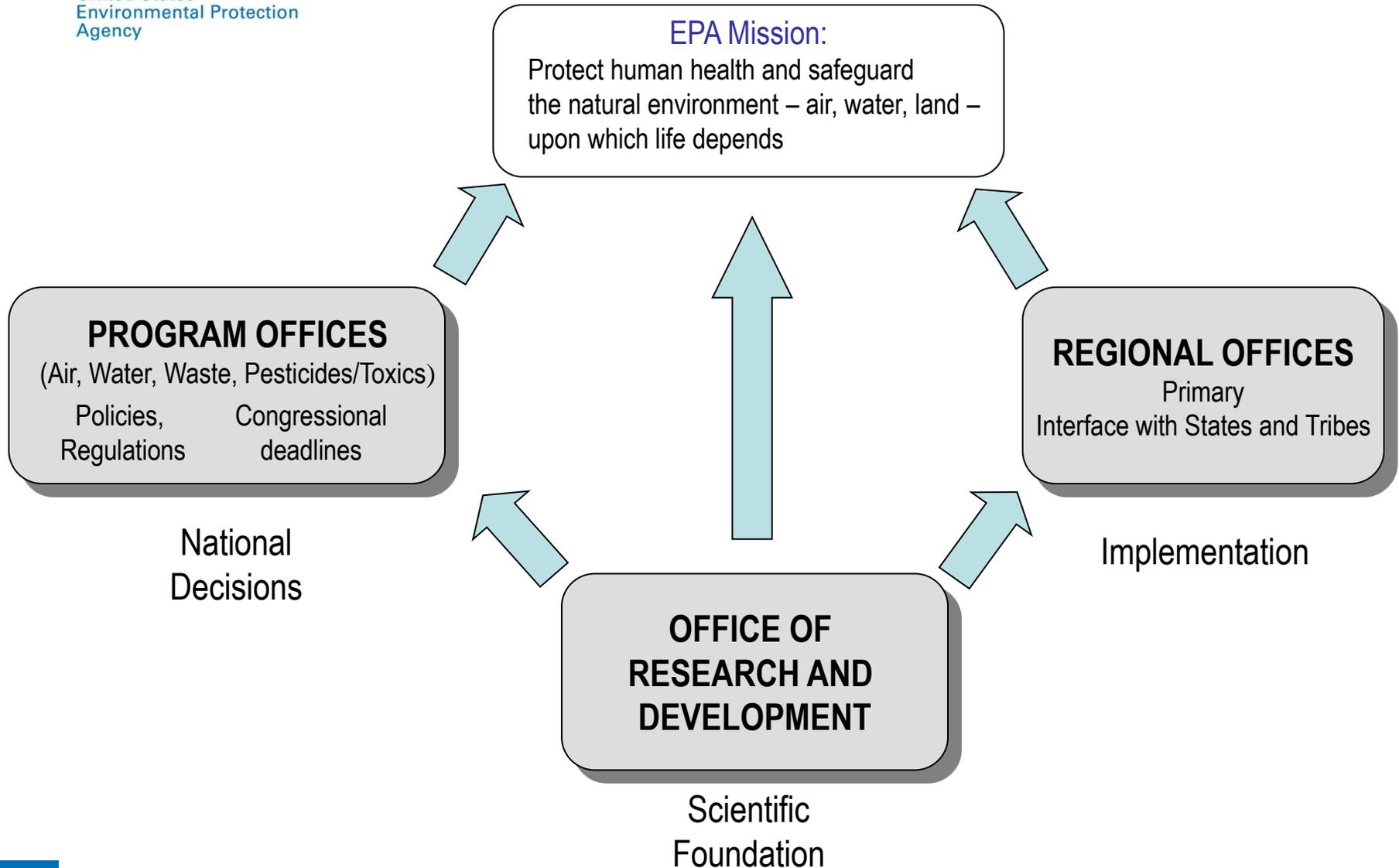


# EPA Organization

Mission: To protect public health and to safeguard and improve the natural environment - air, water, and land - upon which life depends



# Support for EPA's Mission





## ***EPA STAR Research Program***

- **Goal-directed solicitation planning**
- **Significant cross-agency and interagency involvement with solicitation planning, writing, and review**
- **Competitive solicitations: award about \$60 million dollars annually**
- **Joint Solicitations with other Agencies**
- **External peer review**
- **Internal relevancy review: program office and regional input**
- **Fund highest priority projects**
  - Grantees and fellows are among the top scientists in the country
- **Communicate research results through website, ORD laboratories, program office and regional meetings, and publications**  
[\*\(www.epa.gov/ncer\)\*](http://www.epa.gov/ncer)



# STAR Results in Action:

## Regulations and Voluntary Actions

- ***‘Willingness to pay’ for reducing fatal risks does not decline with age. This research contributed to the OMB’s recommendation that EPA not use an age-adjustment factor in its cost-benefit analyses of air quality regulations (Krupnick)***
- ***Results were used by EPA’s Office of Water in preparing: “Economic, Environmental, and Benefits Analysis of the proposed Metal Products & Machinery Rule” (Herriges)***
- ***Research on the effects of air pollution on property values was used as new evidence in planning for EPA’s second prospective 812 cost-benefit study (Smith)***
- **STAR research results on "integrated pest management" used by cities & states to reduce childrens’ exposures to pest allergens**
- **STAR data used to evaluate the effectiveness of EPA’s Residential Use Ban of OP Pesticides**



# STAR Results in Action:

## Tools and Methods for Decision Making

- ***STAR-funded research on marketable permits for air pollution in the presence of pre-existing taxes has been used by the Clean Air Markets Division of EPA/OAR, as well as the Depts of Treasury and Commerce, to evaluate the impacts of carbon taxes and other air pollution trades (Burtraw)***
- ***STAR research developed promising method for assessing pesticide concentrations in saliva – accurate & less invasive method to quantify exposure & dose***
- ***STAR researchers developed molecular detection techniques for pfisteria – used by states and CDC for real time monitoring of pfisteria events***
- ***Research played a key role in the preparation of a manual on economic valuation for the British Department of Environment, Regions, and Transport (Carson)***



# STAR & SBIR Results in Action: Practical Applications

- Alternative dry cleaning solution to replace PERC - now used in more than 100 dry cleaning establishments; same chemistry used to eliminate PFOA from Teflon® manufacturing process (DeSimone)
- Soybean oil plastics being used to manufacture tractor parts for John Deere (Wool)
- Developed a benign catalyst to replace chlorine in oxidation processes (Collins)
- Improved the advanced oxidation process to prevent pollution in foundries – used in 5 foundries showing up to 75% reduction in VOC emissions (Cannon)
- Developed a substitute for lead solder now used broadly in the electronics industry (Wong)
- Sorbent Technologies Corporation developed and is manufacturing a brominated powdered carbon sorbent that is about half as expensive as alternative controls for mercury removal from coal-fired power plants
- Advanced Technology Materials, Inc developed dry scrubber using deposition for semiconductor industry. Business grew from five partners to 1100 employees and sales over \$250 million (NASDAQ : ATMI)



<p><b>Water Infrastructure Sustainability</b></p> <p>Innovations in the condition, function, and energy efficiency of water infrastructure (i.e., centralized and decentralized systems that convey, store, and distribute potable and non-potable water and collect and manage municipal and industrial wastewater, and precipitation) across the spectrum from source water to treatment and distribution systems. 2 existing plus 10 being added.</p>	<p>2008, 2010</p>
<p><b>WQ Protection from Potential Impacts of the Geologic Sequestration of CO2</b></p> <p>Focuses on the protection of existing and future underground sources of drinking water, as well as other aquifer uses, from impacts of the geosequestration of CO2 while leveraging substantial other work. Total of 7 projects.</p>	<p>2009</p>
<p><b>Microbial and Chemical Contaminants</b></p> <p>Research on the epidemiology and quantitative risk assessment of contaminants in drinking water and its sources continue to produce results used by OW and promise a new generation of highly innovative monitoring methodologies that will be faster, more economical and precise assessment of chemicals, microbial agents and cyanotoxins in all types of waters.</p> <p>19 still ongoing, some just closing.</p>	<p>2007, 2005, 2003, 2001</p>
<p><b>Center for Water Law and Policy activities, including Water Law and Policy Clearinghouse.</b> 1 Earmark</p>	<p>2007</p>



# EPA's GS Rulemaking *Rule Development Process*

EPA developed a **Proposed Rule** for Geologic Sequestration (GS) of CO<sub>2</sub>

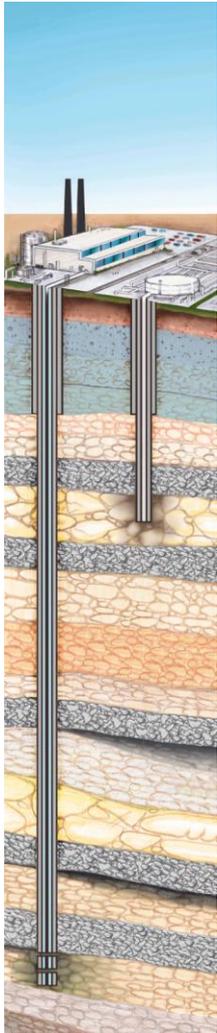
Proposed rule uses Safe Drinking Water Act authorities and revises Underground Injection Control Program requirements for GS

Priority placed on avoiding endangerment of underground sources of drinking water

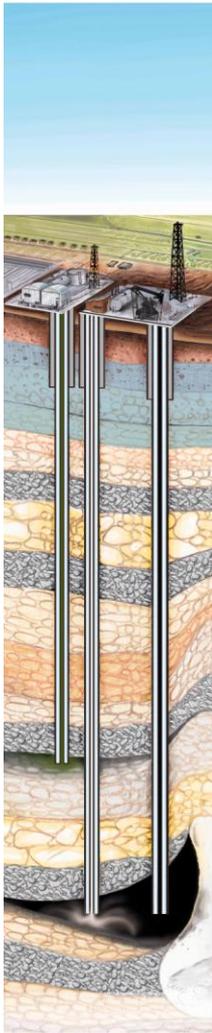
# UIC Program Background

## *UIC Well Classes*

**Class I**



**Class II**



**Class III**



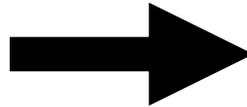
**Class V**



# *Tailor Basic UIC Requirements to Unique Properties of Sequestered CO<sub>2</sub>*

## Unique characteristics of sequestered CO<sub>2</sub>

- Large Volumes
- Buoyancy
- Viscosity
- Corrosivity



## Basic Elements of UIC Program

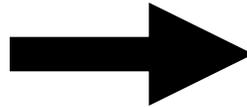
- Site Characterization
- Area Of Review
- Well Construction
- Well Operation
- Site Monitoring
- Well Plugging and Post-  
Injection Site Care
- Public Participation

# EPA's GS Rulemaking

## *Approach to Rulemaking*

### Special Considerations for GS

- Large Volumes
- Buoyancy
- Viscosity (Mobility)
- Corrosivity



### UIC Program Elements

- Site Characterization
- Area Of Review
- Well Construction
- Well Operation
- Site Monitoring
- Post-Injection Site Care
- Public Participation
- Financial Responsibility
- Site Closure

Develop new well class  
for GS – Class VI



# Comment Topics

- Injection Depth and Related Topics
- Post-Injection Site Care Timeframe and Closure
- CO<sub>2</sub> Stream Characterization
- Financial Responsibility and Liability Requirements
- Public Participation, Involvement, and Perception



# More information about the UIC Program

- EPA Geologic Sequestration of Carbon Dioxide Website –  
[http://www.epa.gov/safewater/uic/wells\\_sequestration.html](http://www.epa.gov/safewater/uic/wells_sequestration.html)
- Code of Federal Regulations: Underground Injection Control Regulations 40 CFR 144-148 –  
[http://ecfr.gpoaccess.gov/cgi/t/text/text-idx?sid=d6ee71a544eca89c533c825135913f13&c=ecfr&tpl=/ecfrbrowse/Title40/40cfrv22\\_02.tpl](http://ecfr.gpoaccess.gov/cgi/t/text/text-idx?sid=d6ee71a544eca89c533c825135913f13&c=ecfr&tpl=/ecfrbrowse/Title40/40cfrv22_02.tpl)
- Written comments may be submitted at:  
[www.regulations.gov](http://www.regulations.gov) (docket i.d.: EPA-HQ-OW-2008-0390)