



# EPA Oil Spill Research Grant Program

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National Center for Environmental Research*

## Role of the National Center for Environmental Research (NCER)

- **Manage EPA/ORD extramural research grants**
- **Engage the greater scientific community in complementing EPA research and expanding our understanding of environmental science**
- **Promote creativity and innovation**
  
- **NCER programs:**
  - **Science To Achieve Results (STAR) grants**
  - **Fellowships**
  - **Small Business Innovation Research (SBIR) Contracts**

<http://www.epa.gov/ncer/>

## **GUIDING PRINCIPLES**

- **Sustainability; jobs, health, environment**
- **Innovation**
- **Integration; trans-disciplinary**
- **Synergy; encouraging partnership**
- **Visibility**



## STAR Grants Current Extramural Research Portfolio

- **Sustainability**
- **Particulate Matter**
- **Global Climate Change**
- **Ecosystem Services**
- **Human Health**
- **Environmental Justice**
- **Endocrine Disrupting Chemicals**
- **Computational Toxicology**
- **Drinking Water**
- **Nanotechnology**
- **Water Quality**

<http://www.epa.gov/ncer/>

## How do we decide on research topics?

- **National environmental research needs**
- **EPA Strategic Planning processes**
- **Relevance to Agency mission**
- **Complement research being done in ORD's intramural program**
- **National emergency**

**Explosion and Fire on the Deepwater Horizon**  
*(on April 20, 2010 the Deepwater Horizon exploded, and sank 2 days later)*

**Eleven people  
died and many  
others injured**



**The well began leaking oil from 5,000 feet below the surface of the water**





Mobile, AL

New Orleans, LA

Oil Slick

## Concerns

### Seafood Safety

**Oil components get on the fish, shrimp, crabs, and oysters and taints the taste**

**Oil components may be taken up by oysters**



## Concerns



- **What is that odor?**
- **Is it safe to go on beaches?**
- **The oil is impacting marine life and birds**
- **Long-term societal and economic impact**



**“\$2M.....for a study of long-term risks and impacts from crude oil releases and the uses of chemical dispersants, bioremediation agents...”**



## EPA Oil Spill Research

- **Mitigation of oil spills through chemical, physical, and biological approaches**
- **Fate and effects of oils in saltwater and freshwater systems**
- **Flow characteristics of oil spills**
- **Characterization of oil spill control agents including dispersants, surface washing agents, and bioremediation agents**

**EPA is also a member of the Interagency Coordinating Committee for Oil Pollution Research (ICOPR)**

## What is Crude Oil?

	#Carbons	Product	Physical State
crude oil ↑	C1-C2	Natural Gas;	Gas
	C3-C4	Propane/Butane	
	C5-C10	Gasoline	Volatile/Liquids
	C5-C16	Kerosene/Jet Fuel	
aged ↓	C17-C24	Mineral Oil	Heavy Liquids (Gooney liq)
	>C24	Paraffin/Asphaltenes	Solids (Tar Balls)

## TOXICITY

- **Volatile Liquids: C5-C14**
- **Aliphatic compounds (straight or branched chain) hydrocarbons have a low degree of toxicity**
- **Aromatic compounds are the most toxic fraction of crude oil**
  
- **Heavier Liquids: C16- C22**
- **Aliphatic low toxicity to humans, physical coating of aquatic life and birds**
- **Some PAHs toxic to humans**
  
- **Solids: >C22**
- **Heaviest components of crude oil**
- **Asphaltenes/Paraffins/Tars**
- **Components of the tarballs**
- **Practically non-toxic**

## Dispersants

- **Work by enhancing the mixing of oil with water**
- **Benefits:**
  - minimizes oil concentration and stimulates biodegradation
  - protects the coastal ecosystem
- **Risks:**
  - to organisms that live below the surface or in the deep waters
  - potential toxicity greater than that of oil

*Analysis of Eight Oil Spill Dispersants Using Rapid, In Vitro Tests for Endocrine and Other Biological Activity*

*Environ. Sci. Technol., 2010, 44 (15), pp 5979–5985*





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## Technical Topics

### 1. Technology development

*“DEEP-Sea Oil Plume Enriches Indigenous Oil-Degrading Bacteria”*

*Hazen et al.*

*Science 8 October 2010:*

*Vol. 330. no. 6001, pp. 204 - 208*

### 2. Dispersants with reduced environmental impact

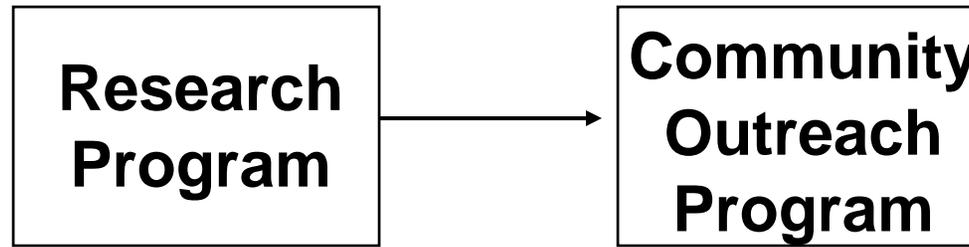
### 3. Ecosystem impacts



**“The president has made clear that he wants restoration plans to come from the gulf coast, and not be imposed on the gulf residents by Washington. We’re counting on the people who know these areas best — the people who call the gulf home — to shape our work,”**

***EPA Administrator Lisa P. Jackson***

## Possible Funding Mechanism



**Short-Term Goal:**

Address Science Questions

Provide Technical Assistance

**Long-term Goal:**

Technical Expertise

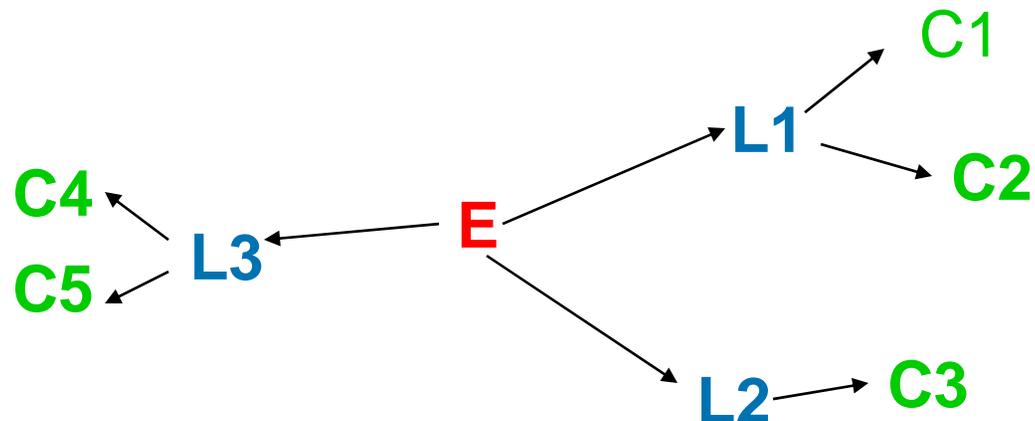
Empower Community

## From the laboratory to the community; How does it work?

Technical and Communication Experts (**E**)

Local College (**L**)

Impacted Community (**C**)



## Activities Supported by the Community Outreach Program

- Technology transfer activities
- Training courses
- Demonstrations

### Examples of Community Services:

- reviewing and interpreting technical documents and other materials;
- offering workshops, short courses, and other learning experiences to explain basic science and environmental policy issues;
- creating technical assistance materials such as visual software and manuals detailing site investigation procedures, and
- offering training on technical issues to community leaders to facilitate their interactions with various stakeholders.

## How the Community Outreach program will work?

- Outreach program will develop a selection process by which communities are nominated and reviewed for suitability
- For the communities selected, a needs assessment is performed to determine the educational needs, the most suitable delivery mechanisms, and the key stakeholders
- The delivery process is complemented by development and implementation of a communication strategy to ensure the effort is widely accessible

## Where are we?

- Request for Application (RfA) pre-announcement posted on our internet site (<http://www.epa.gov/ncer/rfa/>)
- Working with the NSF on a possible partnership
- Target Dec/2010