



# **Analysis of Benefits of EPA Oil Program**

**Dagmar Schmidt Etkin, Ph.D.**

**Freshwater Spills Symposium 2004**



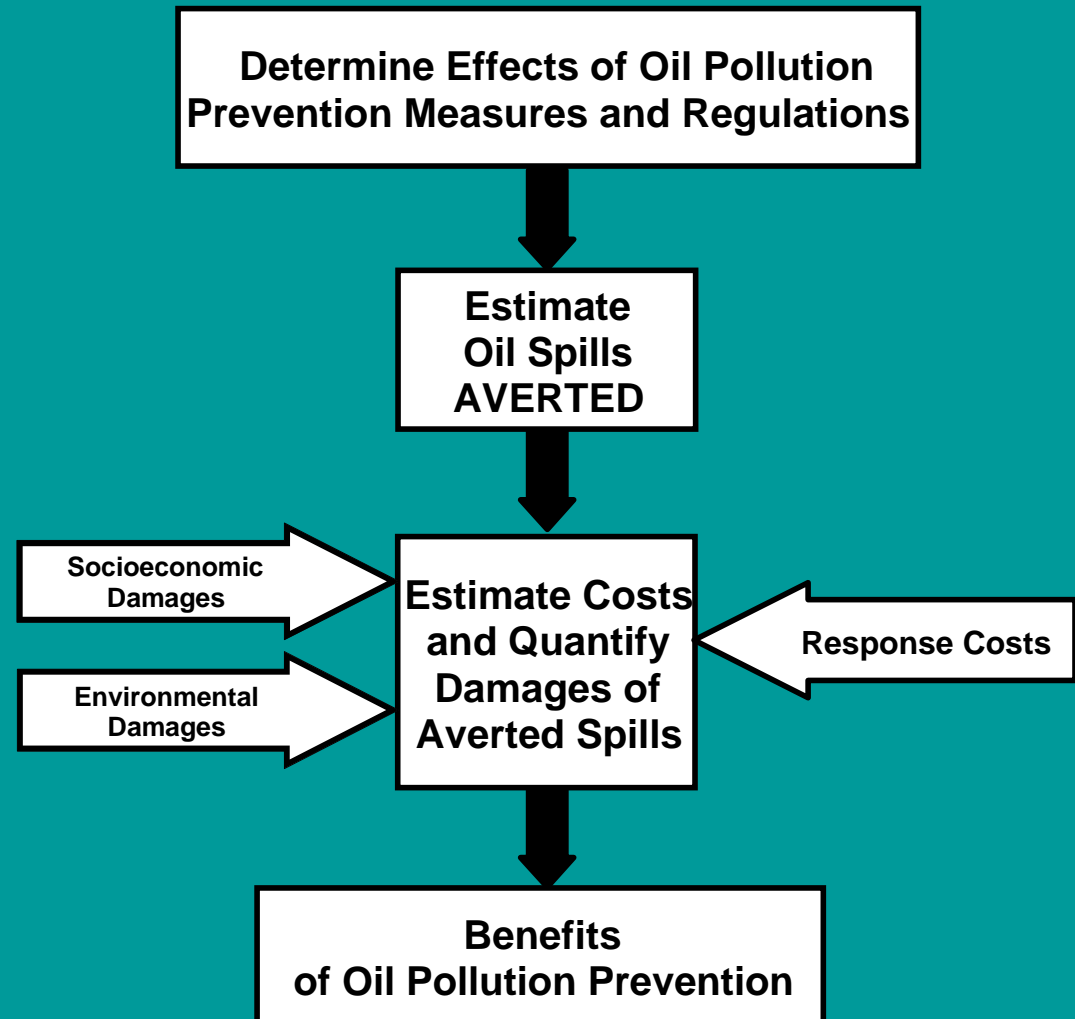
# Purpose of project

- Analyze EPA Oil Program benefits quantitatively with respect to **oil spills prevented** in non-marine navigable waters in EPA jurisdiction and from EPA-regulated facilities

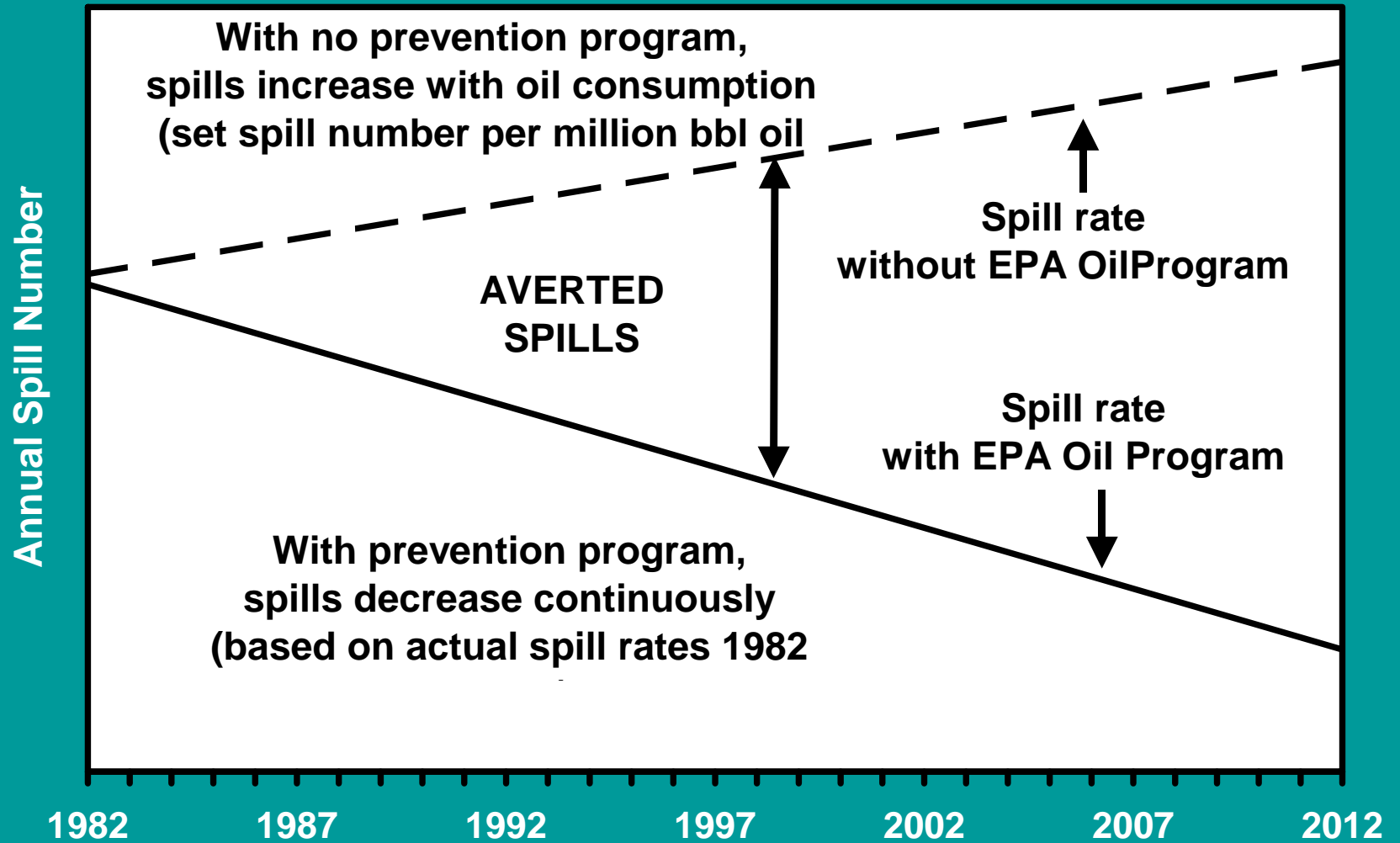


# Analysis of Oil Pollution Prevention at EPA-Regulated Facilities

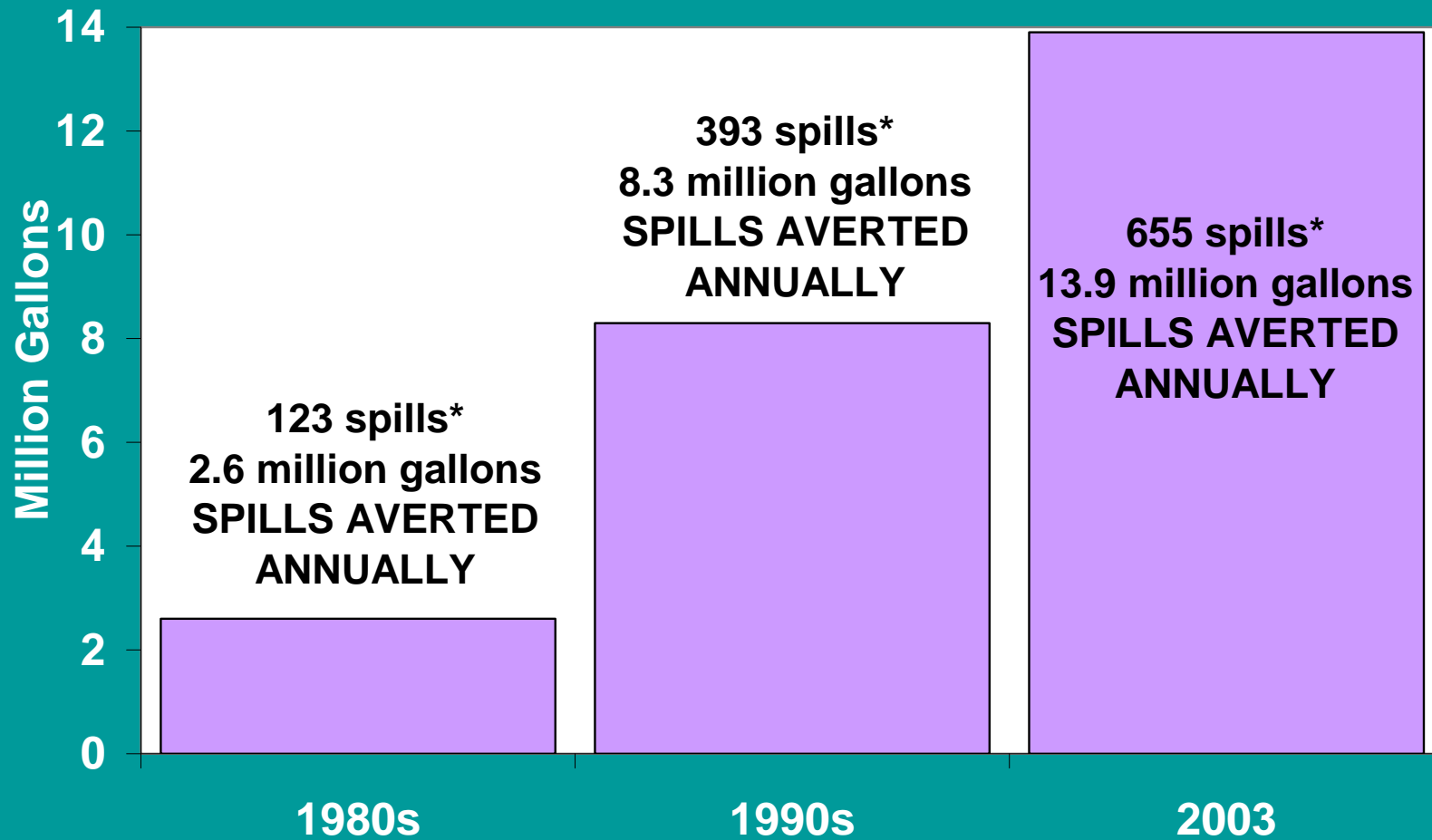
- Determination of oil spillage averted through prevention measures and regulations
- Estimation of value of averted oil spillage (costs and damages)
- Quantification of benefits of oil spill prevention



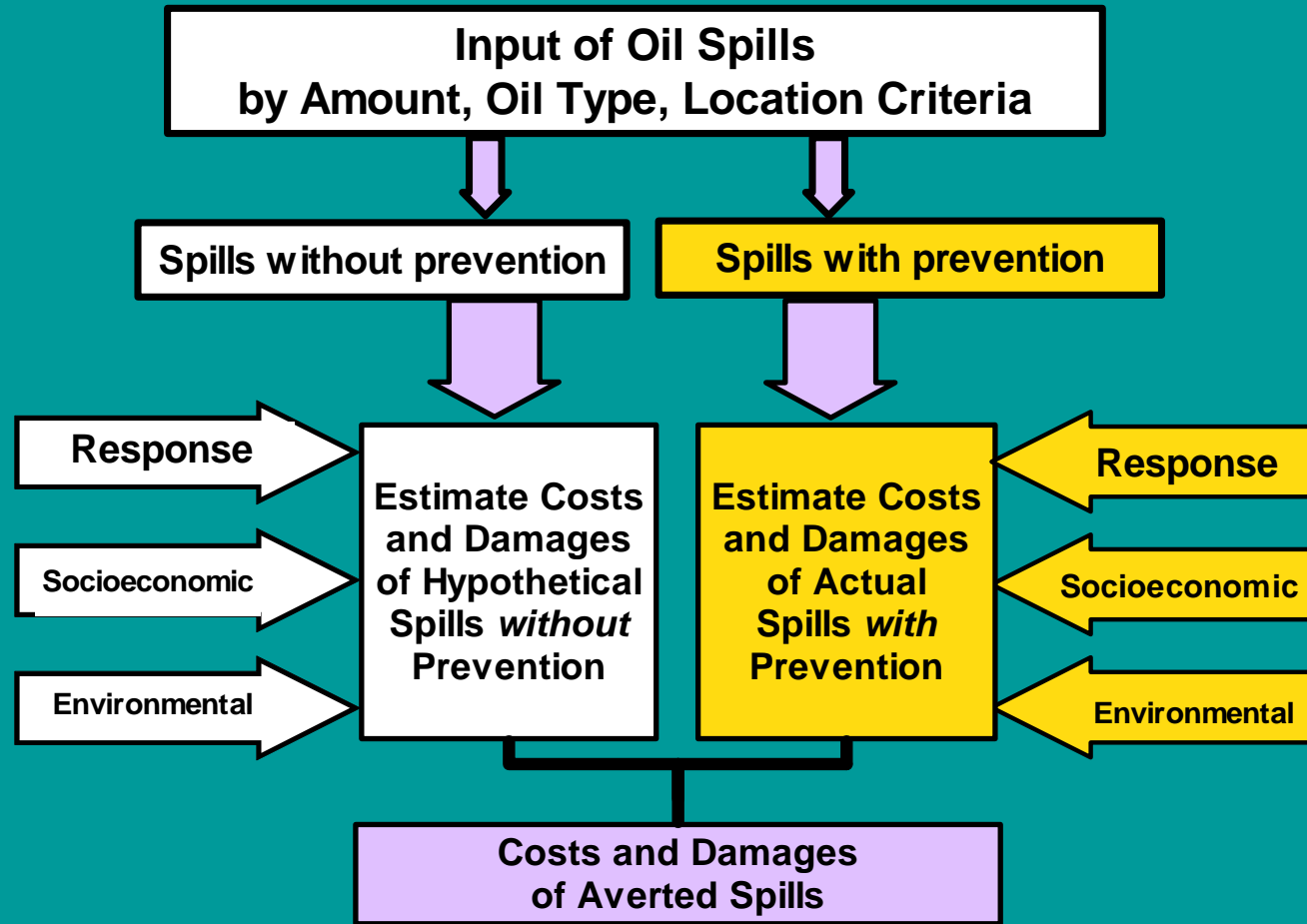
# Estimation of Averted Spills



## Annual Oil Spillage Averted by EPA Oil Program

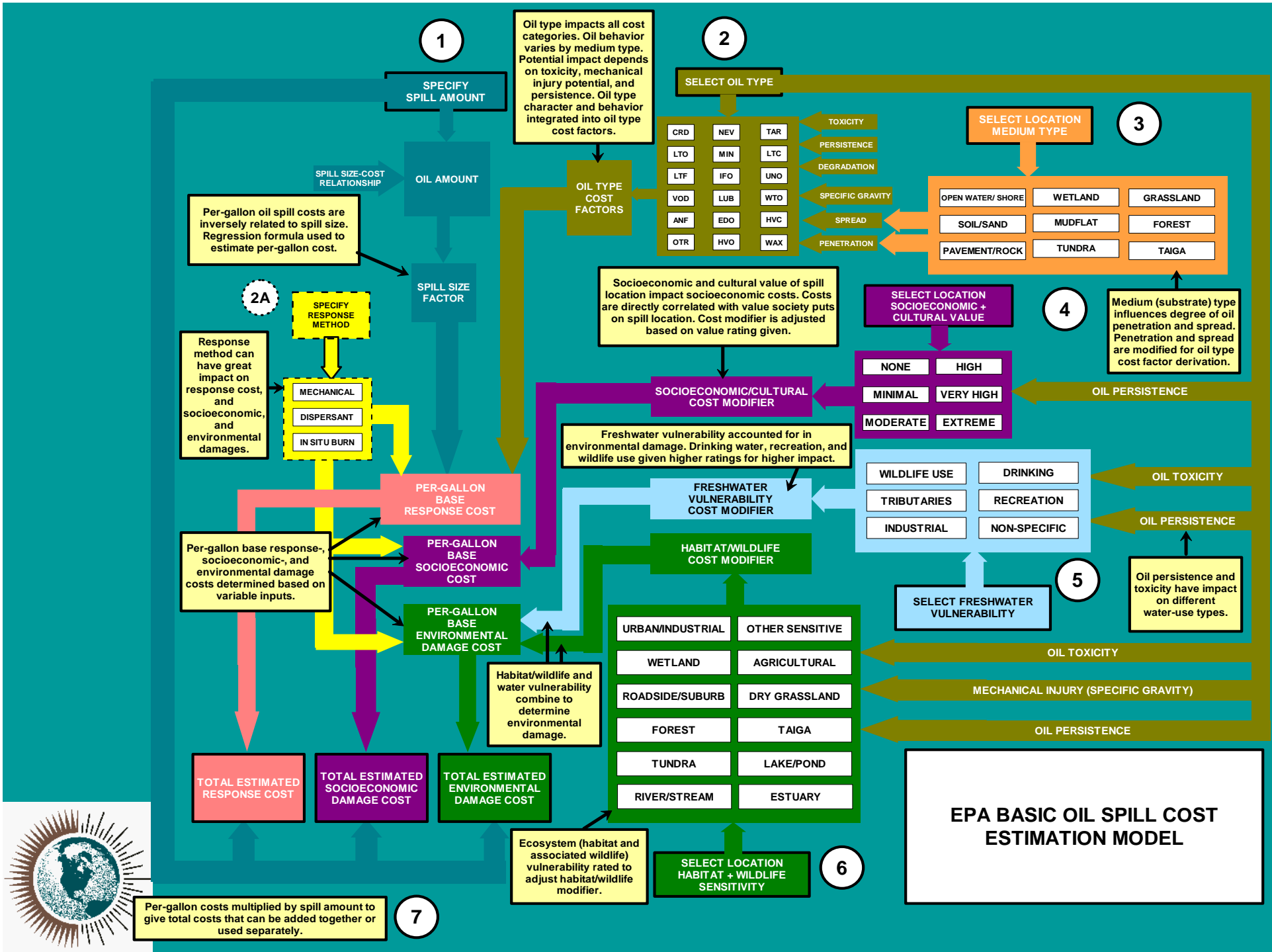


# Determine Costs and Quantify Damages of Averted Oil Spillage

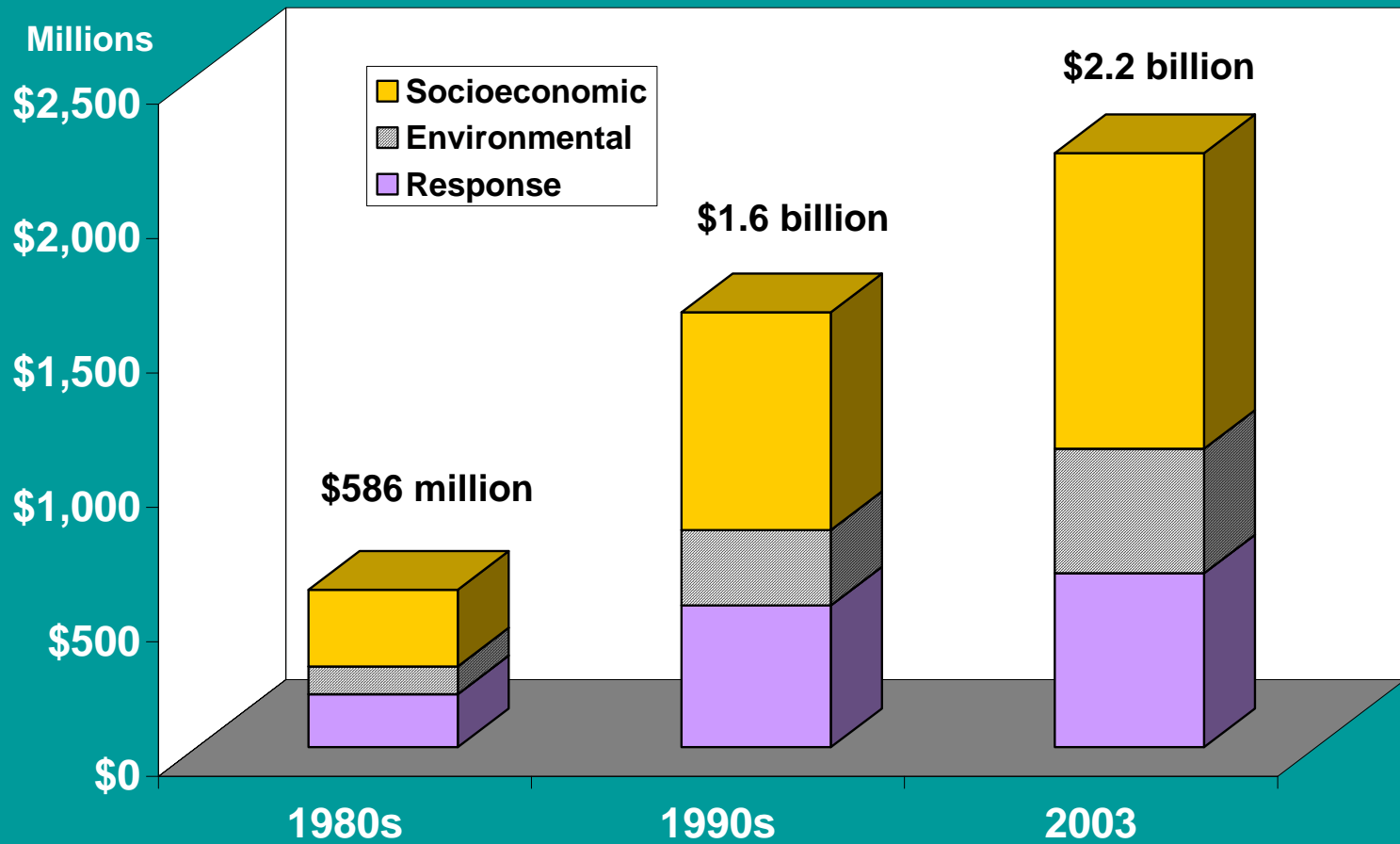


Oil spill response costs and socioeconomic/environmental damages estimated based on EPA Basic Oil Spill Cost Estimation Model for both *averted* spills and *actual* spills





## Annual Oil Spill Costs and Damages Averted By EPA Oil Program Activities



## Key Benefits Study Findings

**1980 to 1992:** EPA-regulated facilities producing, handling, or storing oil discharged 14.6 million gallons into navigable waters *annually* – 33% more than the Exxon Valdez spilled.

**1992 to 2001:** Annual spillage decreased 46%.

**1980 through 2002:** Oil pollution prevention regulations produced benefits estimated at \$32 billion, by averting discharges at EPA-regulated facilities.

- Avoided cleanup costs: \$10 billion
- Avoided environmental damage: \$6 billion
- Avoided socioeconomy damage: \$16 billion



## Key Benefits Study Findings (continued)

**2003: Oil pollution prevention regulations are producing benefits at the estimated rate of \$2.2 billion each year, compared to \$586 million annually in the 1980s.**

- **Avoided cleanup costs: \$647 million annually**
- **Avoided environmental damage: \$463 million annually**
- **Avoided socioeconomic damage: \$1.07 billion annually**



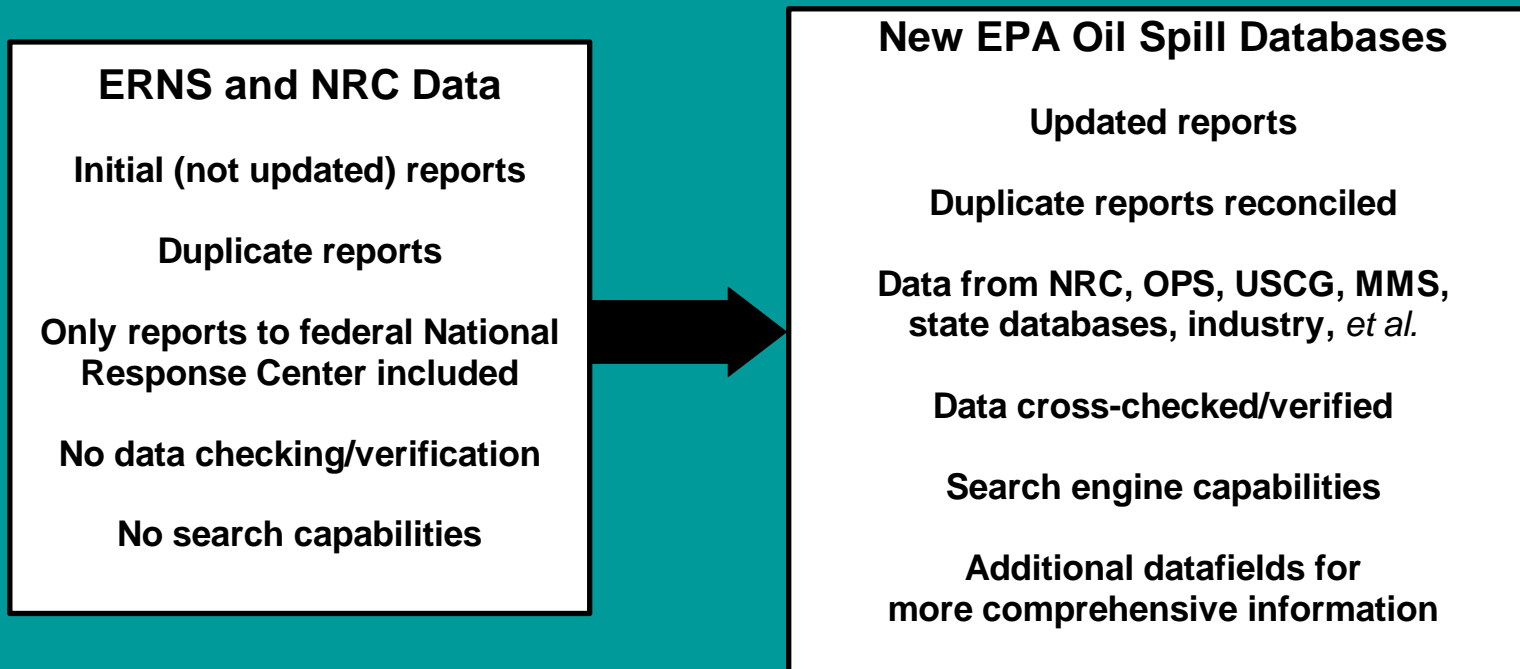
# Other Factors that Influence Oil Spill Reduction

- **Oil Pollution Act of 1990** (OPA 90) increases responsible party liability to unlimited in most jurisdictions – i.e., there is more at stake for spiller
- **High response and damage costs and more litigation** in notorious spills both in the US and internationally
- **State regulations** aimed at spill prevention, including fines and penalties –regulations largely influenced by measures taken by EPA Oil Program and US Coast Guard towards spill prevention and preparedness, as well as OPA 90
- **US Coast Guard oil spill prevention, preparedness and response regulations and programs** increasing safety of vessels (relevant for inland waterway spills in EPA jurisdiction)
- **Better salvage and response preparedness** decreases size of spills by stopping spillage earlier in incident



## Development and Analysis of EPA Oil Spill Databases

- Development of new EPA Oil Spill Databases provides more reliable data with which to track progress
- New databases allowed for more comprehensive and accurate analyses for EPA Oil Program Benefits Study



• Analysis of oil spill trends (amounts, spill numbers) for 1980 to 2002 by source, location, oil type, spill size, and cause conducted



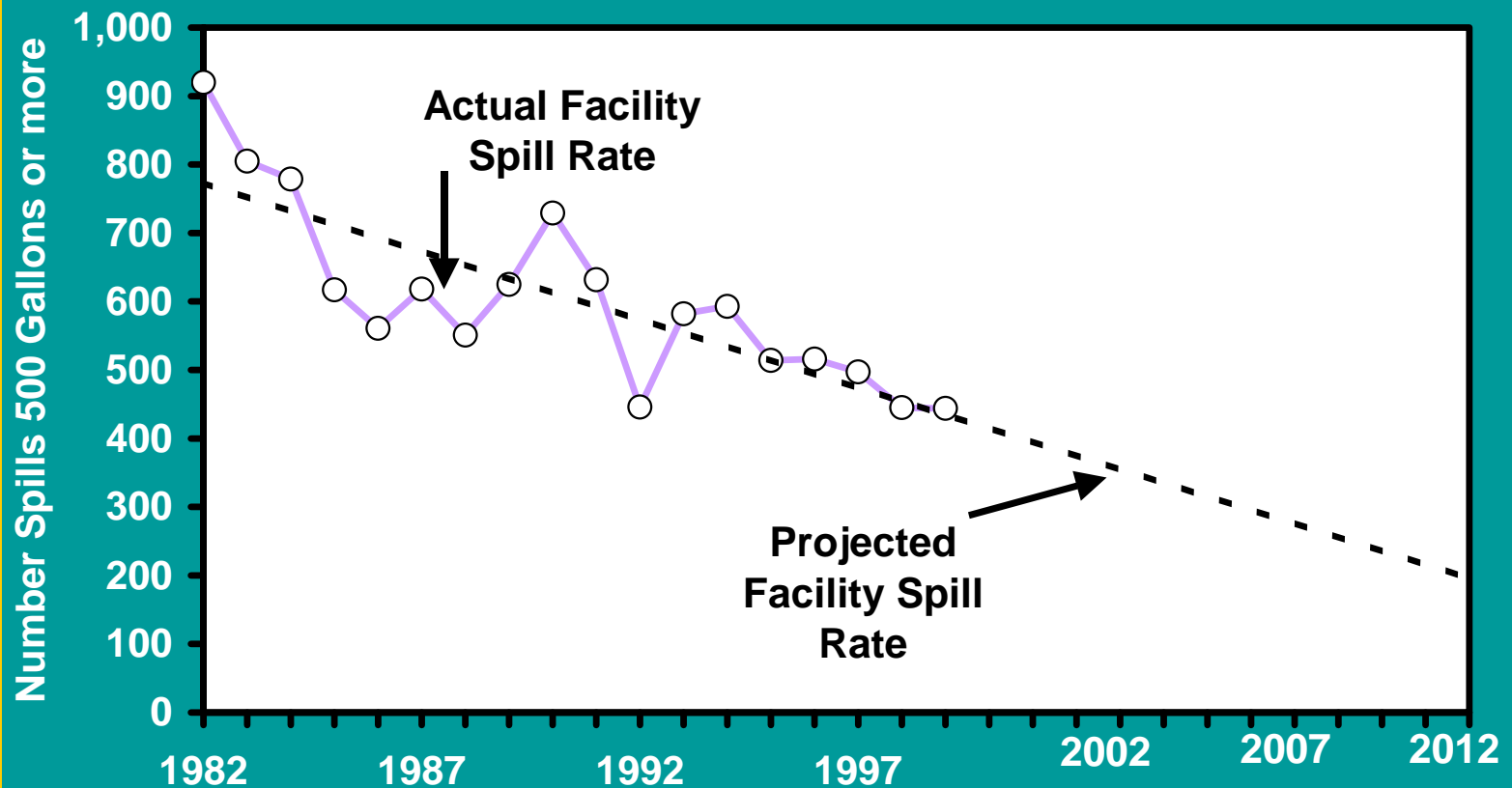
## Key Findings of Oil Spill Data Analysis

- Average annual amount spilled from facilities in 1992 through 2000 is 46% less than for 1980 through 1991.
- **Oil spillage is down while oil consumption has increased.** Spill number per million barrels oil consumed decreased nearly 50% since 1982.
- From 1980 through 2002, the greatest volume spilled was of crude oil and greatest number of spills were in diesel spills from facilities.
- **Reporting of smaller spills (under 500 gallons) that were previously not reported to authorities has significantly increased.**



# Finding: Number of Spills and Amount Spilled Projected to Decrease

Projected Number of Facility Oil Spills  
500+ Gallons Into Non-Marine Navigable Waters  
(Analysis by Environmental Research Consulting)



## **Key Findings of Oil Spill Data Analysis (continued)**

- **Operational error leads known causes of oil spills from facilities (except pipelines): 24% of incidents.**
- **57% of volume spilled due to structural failure or equipment malfunction.**
- **Pipelines are the source of the largest number of spills and second highest source of total volume spilled. (Note: many pipelines are regulated by DOT.)**



## How much have EPA Oil Program's activities contributed to the reduction in oil spills?

- Complex interrelationship among EPA's oil spill prevention actions and those of state environmental agencies, public, and industry
- Many state environmental agencies have developed own oil prevention programs, often stemming from EPA's leadership
- Industry taken voluntary actions, often to avoid new regulations and to have more control over prevention measure implementation
  - Significant financial incentives to reduce oil spillage, as spill response and damage settlements can be formidable
  - Greater concern about public image as people have become more educated on environmental issues (much to credit of EPA)
- More detailed research of industry and state regulatory costs may reveal more information on EPA's contribution, which is uncertain at this time





**This project by Environmental Research Consulting was funded by the US EPA Oil Program under subcontract to Abt Associates, Inc.'s EPA Contract No. 68-W-01-039**

**EPA BOSCEM is a custom modification of a proprietary oil spill cost modeling program, ERC BOSCEM, developed by Environmental Research Consulting with partial funding by Univ. New Hampshire/National Oceanic & Atmospheric Administration Cooperative Institute for Coastal and Estuarine Environmental Technology Contract NA17OZ2607 (CFDA No. 11.419) Subcontract 03-689.**

