



# Office of Science and Technology

## What OST Works On

- *Effluent Guidelines*
- *Water Quality Standards*
- *Water Quality Criteria*
- *Analytical Test Methods*
- *Beach Water Quality*
- *Fish and Wildlife Consumption Advisories*
- *National Fish Tissue Study*
- *Drinking Water and Health Advisories*
- *Contaminated Sediments*
- *Water Quality Models*
- *Cooling Water Intake Structures*



## Other EPA Water Offices:

- Office of Wastewater Management
- Office of Wetlands, Oceans, & Watersheds
- Office of Ground Water and Drinking Water
- American Indian Environmental Office

## What We Do

The Office of Science and Technology (OST) sets national environmental baselines for the quality of the Nation's waters. OST ensures these baselines reflect the latest water pollution science and best available water pollution control technologies to support the Office of Water's programs to keep water safe and clean. Every year under the Clean Water Act and Safe Drinking Water Act, OST produces major water pollution control regulations, guidelines, methods, standards, science-based criteria and studies that are critical components of national programs that protect people and the aquatic environment.

### OST works in three main program areas:

- Engineering and Analysis
- Standards and Health Protection
- Health and Ecological Criteria

### Developing the Scientific Basis for a Regulatory Framework

OST conducts and sponsors extensive research and empirical studies that help other EPA programs, states and tribes protect their drinking water supplies and minimize the effects of pollutants on fish, wildlife, and the aquatic environment. Federal, state, tribal and local governments use this information to set limits on the kinds of pollutants that may be discharged by industries directly into waters and through wastewater treatment plants. OST works closely with stakeholders, who include states, tribes, local governments, industry, environmental groups and academics, to help them set and meet their water quality goals. Our stakeholders also participate in identifying manufacturing processes that reduce or prevent the production of polluting chemicals and in setting our future regulatory goals. While OST's products form the scientific basis for most water programs that protect human health and the aquatic environment, EPA's ten regional offices communicate the information to our co-regulators and the public. Together with EPA's Office of Research and Development, other Office of Water offices, and the regions, OST provides the tools and the training that states and tribes need to develop and maintain strong scientifically-based water pollution control programs.



## OST Gives Scientific & Technical Support to:

Point source discharge programs



Nonpoint source programs



Wetlands programs



Drinking water programs



Dredged material management programs



Geographic specific programs (e.g. Great Lakes, coastal areas, estuaries)



Total Maximum Daily Loads



Water quality monitoring programs

# Engineering and Analysis

The Engineering and Analysis Division (EAD) develops National technology-based limitations that control pollutant discharges from industry into surface waters and into wastewater treatment works. EAD regulations also control the intake of cooling water. EAD identifies and analyzes industrial processes and wastewater treatment technologies. EAD also develops laboratory analytical test methods. These processes, technologies, and methods are the basis of national regulations and the basis of thousands of discharge permits. Many of the pollutants controlled by EAD's work are persistent toxic compounds like lead or benzene, but the guidelines also address conventional pollutants.

## Effluent Guidelines

[www.epa.gov/waterscience/guide](http://www.epa.gov/waterscience/guide)

We develop technology-based effluent guideline regulations that limit pollution from over 50 industrial categories (including chemical and pulp and paper manufacturing). These rules involve extensive industry-specific engineering and economic studies, wastewater analyses, and treatment option assessments. Effluent guidelines ensure that industrial wastewaters will achieve levels of pollutants based on the best technology that is affordable. EPA issues effluent guidelines for categories of existing sources and new sources under Title III of the Clean Water Act.



Concentrated Animal Feeding Operations

Iron & Steel



## Key OST Partnerships

- Other Government Agencies
- Other EPA Offices
- Other OW Programs
- Regional Offices
- State/Interstate/Tribal/Local Partners
- Regulated Community
- General Public

## Effluent Guidelines Under Development and Recently-Published

- Aquatic Animal Production
- Centralized Waste Treatment
- Coal Mining
- Coastal Oil and Gas
- Commercial Hazardous Waste Combustors
- Construction and Development
- Concentrated Animal Feeding Operations
- Iron and Steel Manufacturing
- Landfills
- Meat and Poultry Products
- Metal Products and Machinery
- Offshore Oil and Gas
- Pesticide Formulating & Packaging
- Pesticide Chemicals Manufacturing
- Pharmaceutical Manufacturing
- Pulp, Paper, and Paperboard
- Synthetic-Based Drilling Fluids
- Transportation Equipment Cleaning

## Analytical Methods and Laboratory Services

[www.epa.gov/waterscience/methods](http://www.epa.gov/waterscience/methods)



EAD is the arm of OST that develops and validates laboratory analytical methods to analyze wastewater, drinking water, sediment, and other environmental media to be used by industries, states, municipalities, and tribes. In addition, EAD provides a wide spectrum of laboratory analytical services to support data collection projects, such as National Fish Tissue Study and Biosolids Survey.

## Protecting Water Quality Through Science

## Water Quality Modeling

[www.epa.gov/waterscience/models/](http://www.epa.gov/waterscience/models/)

SHPD supports the development of TMDLs (Total Maximum Daily Load) for impaired waterbodies through the development and use of modeling tools such as BASINS and AQUATOX.



## Standards and Health Protection

The Standards and Health Protection Division (SHPD) directs the national program for adoption of State and Tribal water quality standards. It develops policies and guidance, and provides assistance to EPA regional offices and states on adopting appropriate uses, water quality criteria, and antidegradation protection for specific water bodies, and on development of total maximum daily loads to meet water quality standards. SHPD also develops and manages cross-media, agency wide policies to limit the public's exposure to toxicants and pathogens. Lastly, SHPD conducts environmental assessments to help evaluate the effects of regulations on water quality.

## Water Quality Standards

[www.epa.gov/waterscience/standards](http://www.epa.gov/waterscience/standards)

SHPD is improving the process for developing, adopting, and approving water quality standards that support our regions and their partners in defining, and then maintaining, their locally-designated state and tribal water uses. We are committed to building productive working relationships as states and tribes improve their water quality standards programs and, where needed, revise their water quality standards regulations to support those improvements.

Fishable

Swimmable

Drinkable



## Contaminated Sediments

[www.epa.gov/waterscience/cs](http://www.epa.gov/waterscience/cs)

OST assesses the extent, severity, and sources of contaminated sediment in the United States. We develop tools designed to prevent the volume of contaminated sediment from increasing and to reduce the existing volume. As required by the Clean Water Act, SHPD develops and submits to the Congress the biennial National Sediment Quality Inventory. We also play a leadership role in assuring EPA implements the Agency's Contaminated Sediment Management Strategy.



## BEACH Watch

[www.epa.gov/waterscience/beaches/](http://www.epa.gov/waterscience/beaches/)

Under the BEACH Program, EPA develops new laboratory test methods for detecting contaminants in beach water and SHPD provides grants to state, tribal, interstate, and local agencies to establish effective monitoring and public notification programs for beaches. BEACH Watch is the first federal Internet-based information system to inform the public about local beach closings and conditions.



## Fish and Wildlife Consumption Advisories

[www.epa.gov/waterscience/fish](http://www.epa.gov/waterscience/fish)



This SHPD program assists states and tribes in communicating to their residents the risks of eating contaminated fish and providing the tools they need to help lessen these risks. SHPD maintains the National Listing of Fish and Wildlife Advisories, a user-friendly database that is available to the public via the Internet, and develops technical documents and guidance materials that help states and tribes monitor, assess, and notify the public when and where non-commercial fish are not suitable to eat.



## National Fish Tissue Study

[www.epa.gov/waterscience/fishstudy](http://www.epa.gov/waterscience/fishstudy)

SHPD has the lead for conducting EPA's National Fish Tissue Study, a screening-level study to estimate the national distribution of Persistent, Bioaccumulative, and Toxic (PBT) chemicals in fish from lakes and reservoirs of the continental U.S. The 4-year (2000-2003) study will define national background levels for 265 chemicals in fish and establish a baseline to track progress of pollution control activities.

# Health and Ecological Criteria

[www.epa.gov/waterscience/criteria](http://www.epa.gov/waterscience/criteria)

The Health and Ecological Criteria Division (HECD) conducts risk assessments and develops goals for surface waters and drinking water to ensure they are safe for aquatic life, human use, and consumption. The Division scientists also provide technical assistance to states, tribes and drinking water authorities on criteria implementation, site specific adjustment, data analysis, and health advisories.

## Goals Under Development and Recently Published

### Aquatic Life

Nutrient Criteria to Protect Surface Waters

[www.epa.gov/waterscience/standards/nutrient.html](http://www.epa.gov/waterscience/standards/nutrient.html)

- Rivers & Streams
- Estuarine & Coastal
- Lakes & Reservoirs
- 26 Criteria Documents
- Nutrient Database
- Wetland Modules

Chemical Criteria to Protect Aquatic Life

[www.epa.gov/waterscience/criteria](http://www.epa.gov/waterscience/criteria)

- Ammonia
- Lead
- Atrazine
- Nonylphenol
- Cadmium
- PCP Pentachlorophenol
- Copper
- Selenium
- Diazinon
- Salt Water Dissolved Oxygen
- Tributyltin
- Silver
- National Recommended Water Quality Criteria Table



Biological Criteria for Surface Water Integrity

[www.epa.gov/waterscience/biocriteria](http://www.epa.gov/waterscience/biocriteria)

- Estuarine & Coastal
- Rivers & Streams
- Lakes & Reservoirs
- Stressor Guidance
- Large Rivers
- Wetlands

### Human Health

[www.epa.gov/waterscience/criteria](http://www.epa.gov/waterscience/criteria)

#### Drinking Water

- Acanthamoeba
- Legionella
- Aeromonas
- Manganese
- Arsenic
- Mycobacteria
- Disinfection Byproducts
- Radionuclides
- Drinking Water Intake Report
- Radon
- Enteroviruses & Hepatitis A
- Viruses
- Giardia
- Waterborne Infectious Disease Strategy
- Cryptosporidium

#### Surface Water

- Methylmercury Fish Concentrations
- Methodologies
- 26 Updated Criteria



### Cooling Water Intake Structures

[www.epa.gov/waterscience/316b](http://www.epa.gov/waterscience/316b)

The Engineering and Analysis Division develops regulations to address the impact of cooling water withdrawal on aquatic ecosystems. Power plants and large factories may use hundreds of millions or billions of gallons of water daily for cooling. Intake regulations keep fish and shellfish from being killed or injured as a result of being pulled into cooling systems or trapped against intake screens.