

# Delaware River Basin Commission



## A Spatial and Temporal Study of Polychlorinated Biphenyls (PCBs) in Fish Tissue from the Delaware River and Bay

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Society

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# Why was the DRBC created?



- Water supply shortages and disputes over the apportionment of the basin's waters;
- Severe pollution in the Delaware River and its major tributaries;
- Serious flooding

- DRBC is made up of Five Equal Members:
  - Delaware
  - New Jersey
  - Pennsylvania
  - New York
  - Federal Government

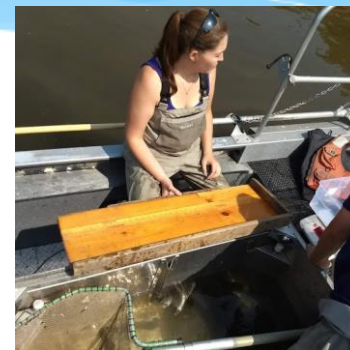


The 1937 *Philadelphia Record* editorial page cartoon depicts the time when the tidal Delaware was an open sewer, where pollution in some stretches robbed the river of all its oxygen needed to support fish and other aquatic life.

# Outline



- Overview of DRBC Fish Tissue Monitoring
  - Locations and Sample Design
  - Parameters and Methods
- PCB Data
- PCB Reduction Strategies
- Fish Consumption Advisories

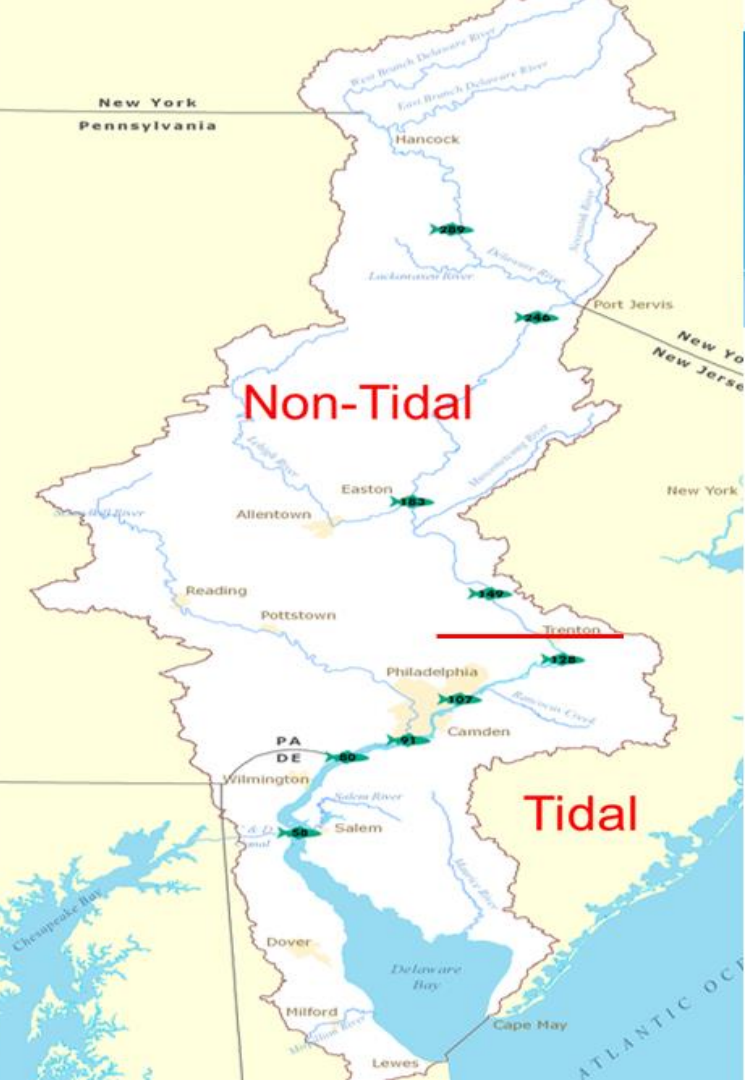


# Why Monitor Fish?



- Integrator of exposure
- Assessment of human health impacts from fish consumption
- Track changes
- Share information with NJ, NY, DE, PA (for establishment of fish consumption advisories)
- Inform management strategies i.e. Pollutant Minimization Plans (PMPs)

# Sampling Locations and Fish Species



## Non-Tidal Locations

Narrowsburg, NY	RM 290
Milford, PA	RM 246
Easton, PA	RM 183
Lambertville, NJ	RM 149

## Tidal Location

Crosswicks Creek	RM 128
Tacony-Palmyra Br.	RM 107
Woodbury Creek	RM 91
Raccoon Creek	RM 80
Salem River	RM 58

## Non-Tidal Fish Species

*Catostomus commersonni* (white sucker)  
*Micropodus dolomieu* (smallmouth bass)

## Tidal Fish Species

*Ictalurus punctatus* (channel catfish)  
*Morone americana* (white perch)

## Sample Design

Collected periodically by electrofishing or hook & line

Composite of five (5) fish of similar size of each species collected at each location (fillet)

# Parameters and Methods



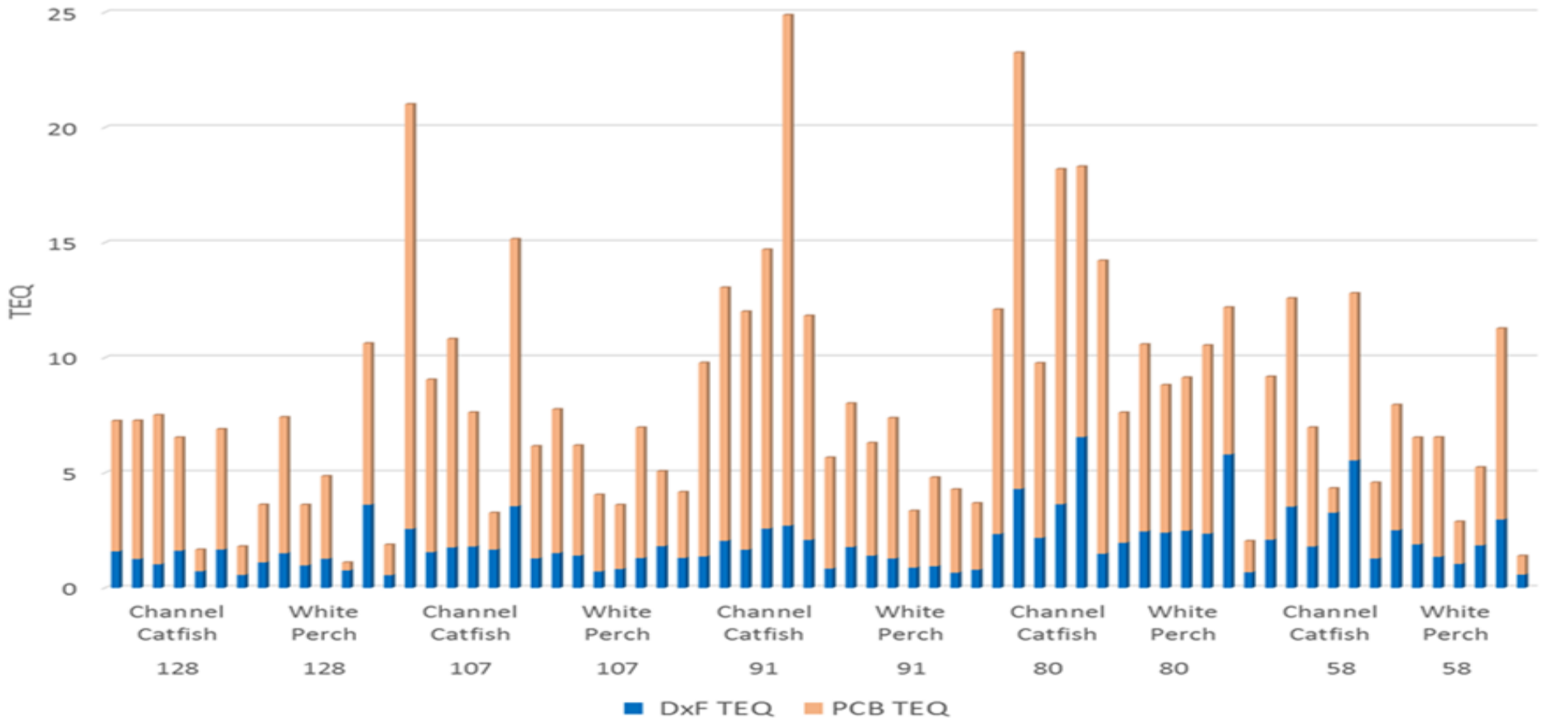
- PCB- all 209 congeners using Method 1668A (since 2004)
- Dioxin/Furans- 17 compounds using Method 1613B
- PBDE- 46 congeners using Method 1614 HRGC/ LRMS
- PFAS - 13 compounds using a LC/MS/MS method
- OC Pest –29 compounds using Method 1699
- Total Mercury by Method 1631
- Methyl Mercury by Method 1630

# Why study PCBs?

- Widely used in electrical equipment, paints, and other applications
- A probable human carcinogen; 12 congeners have dioxin-like effects; developmental, neurobehavioral, and immune system effects



# PCB and DxF TEQs

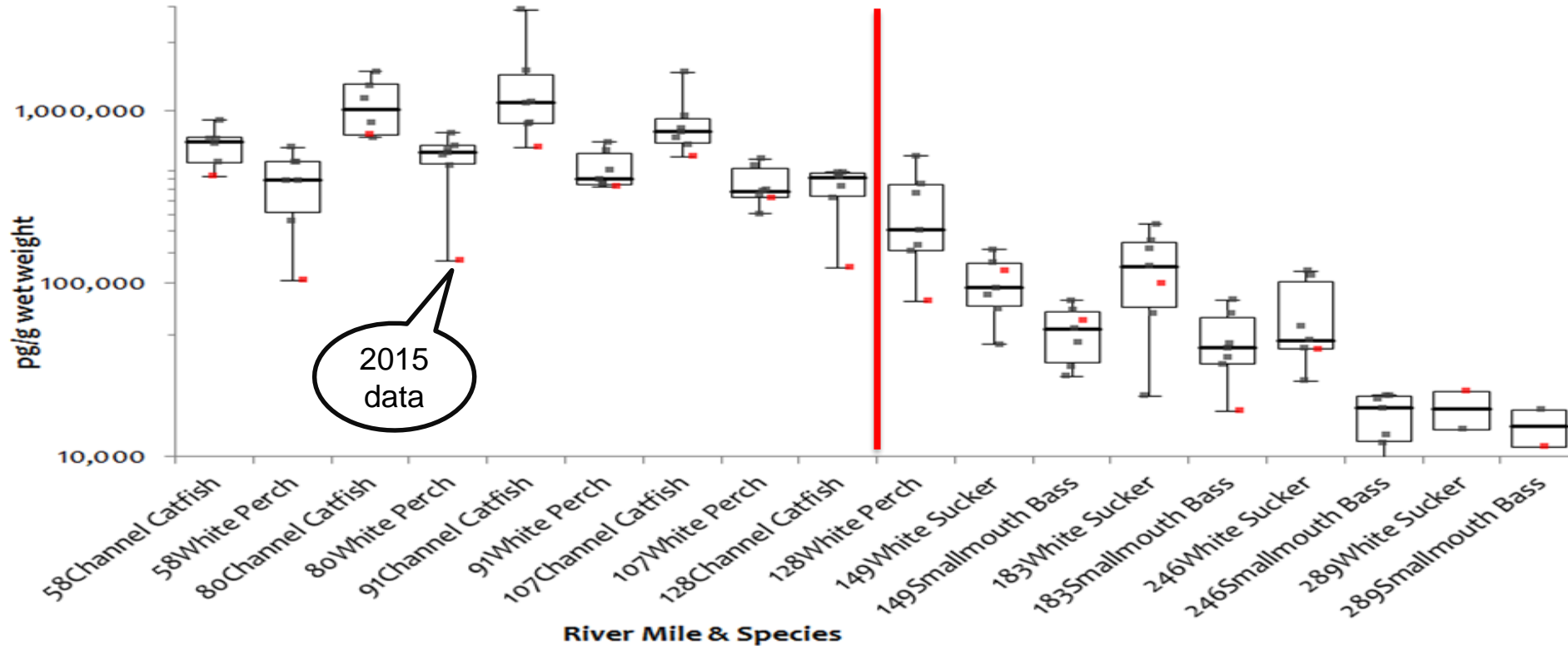




# tPCB Concentrations 2004-2015

**Tidal**

**Non-Tidal**



# PCB TMDL Implementation

**PMP** required through >90 NPDES permits or Commission regulations beginning in 2005

**Goal** is to reduce PCB Loadings

## Key Elements

Source identification and reduction

Monitoring and progress reports

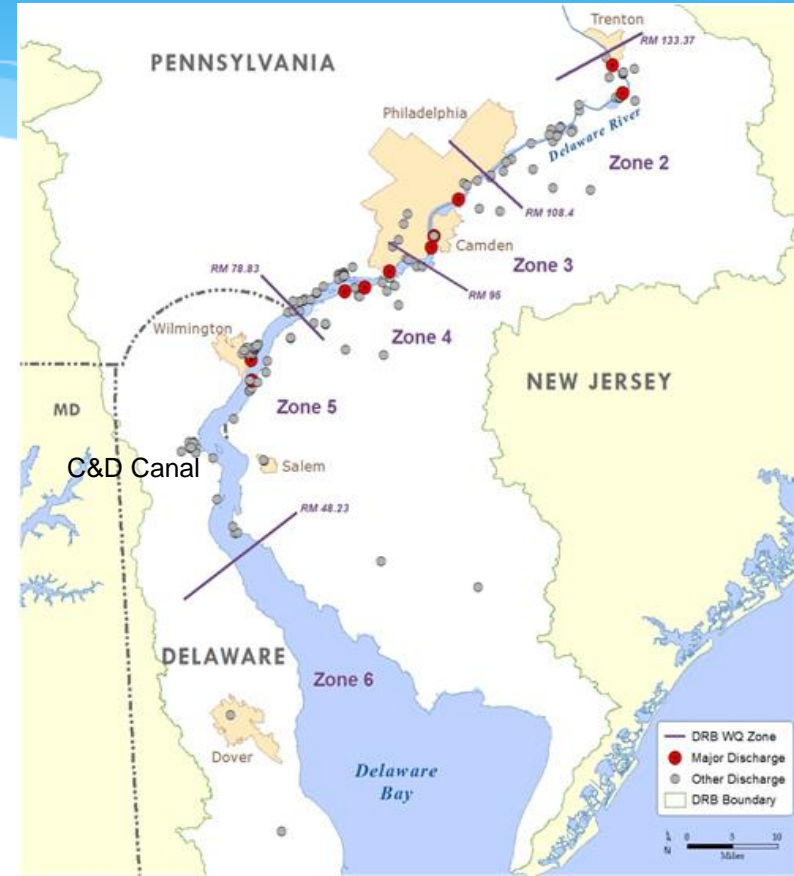
Measuring effectiveness of initiatives

## Approaches

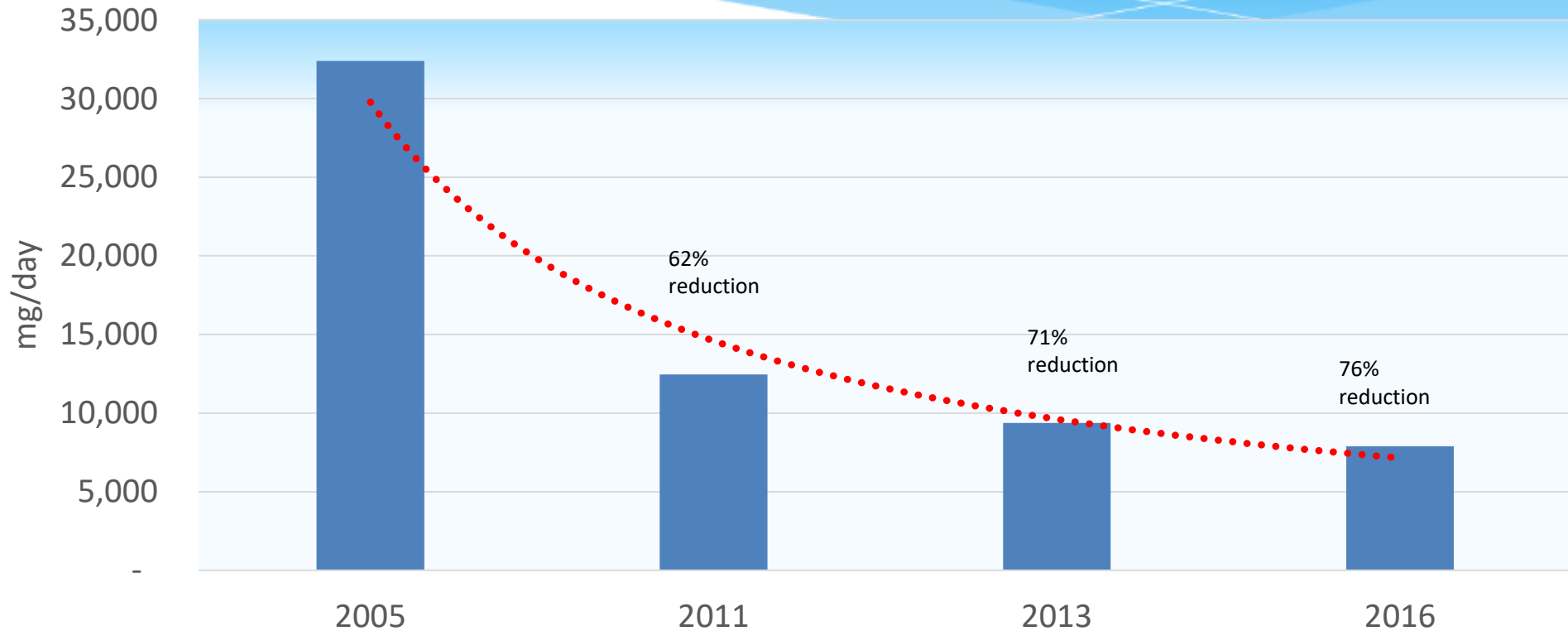
Remove PCB transformers and capacitors

Trackdown studies to identify and remove sources

Sediment control and removal



# PCB Loadings Top Ten Point Source Dischargers mg/day



# Fish Consumption Advisory Changes

## General Population

### Contaminant PCB



- New Jersey and Delaware have revised advisories in the Delaware Estuary (tidal) from PA/DE Border to C&D Canal (RM:80-58)
  - All fin fish including; white perch and channel catfish
    - Before 2015 Do not eat
    - 2015-2017 One meal per year
    - 2018 Three meals per year
- PA revised fish consumption advisory for carp (*Cyprinus carpio*)  
*Do Not Eat* to six meals per year in 2016  
Trenton, NJ - Morrisville PA bridge to PA/DE border

# EPA Fish and Shellfish Program Newsletter



July 2018 Issue

## New Fish Consumption Advisories Reflect Continuing Improvements in Water Quality for Delaware Waterways

DNREC Secretary Shawn M. Garvin. “I anticipate that, with continued cleanup efforts and cooperation between DNREC, DHSS, and our regional partners who include New Jersey Department of Environmental Protection and the Delaware River Basin Commission that we will continue to see a trend of improvement into the future.”

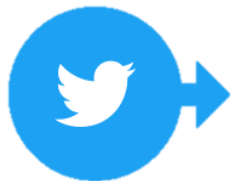
<https://www.epa.gov/sites/production/files/2018-08/documents/fish-news-july2018.pdf>

# Summary

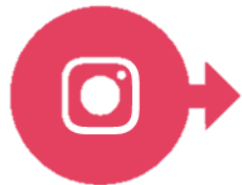


- PMPs have reduced PCB loadings from top ten NPDES point sources by 76% since 2005
  - Continuing program
- Fish consumption advisories have improved in the Delaware Estuary
- DRBC continues to track PCB & other contaminants in fish

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**= @DRBC1961  
@AmFisheriesSoc  
#FishMonitoring  
#PCB  
#AFS148**



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