

# Has the Clean Water Act Been Successful?

## *A 40-Year Retrospective Analysis of the Southern California Coastal Ocean*

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**California Water Quality Monitoring Council**

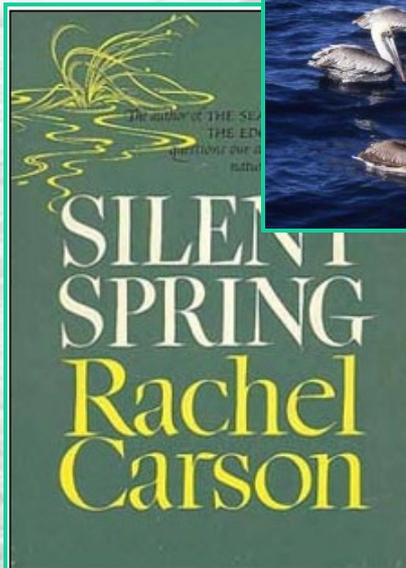
**Nov 28, 2012**



# 40 Years Ago: Many Changes in Perceptions and Environmental Regulations

- 1972 - Federal Water Pollution Control Amendments (Clean Water Act; amended in '77)

- 1969 - Porter-Cologne Water Quality Control Act



# Southern California Makes a Good Case Study

- Over 22 million people
- Four of the largest POTWs in the Country
- Earliest Municipal Stormwater discharge permits
- Large, long-term investment in monitoring



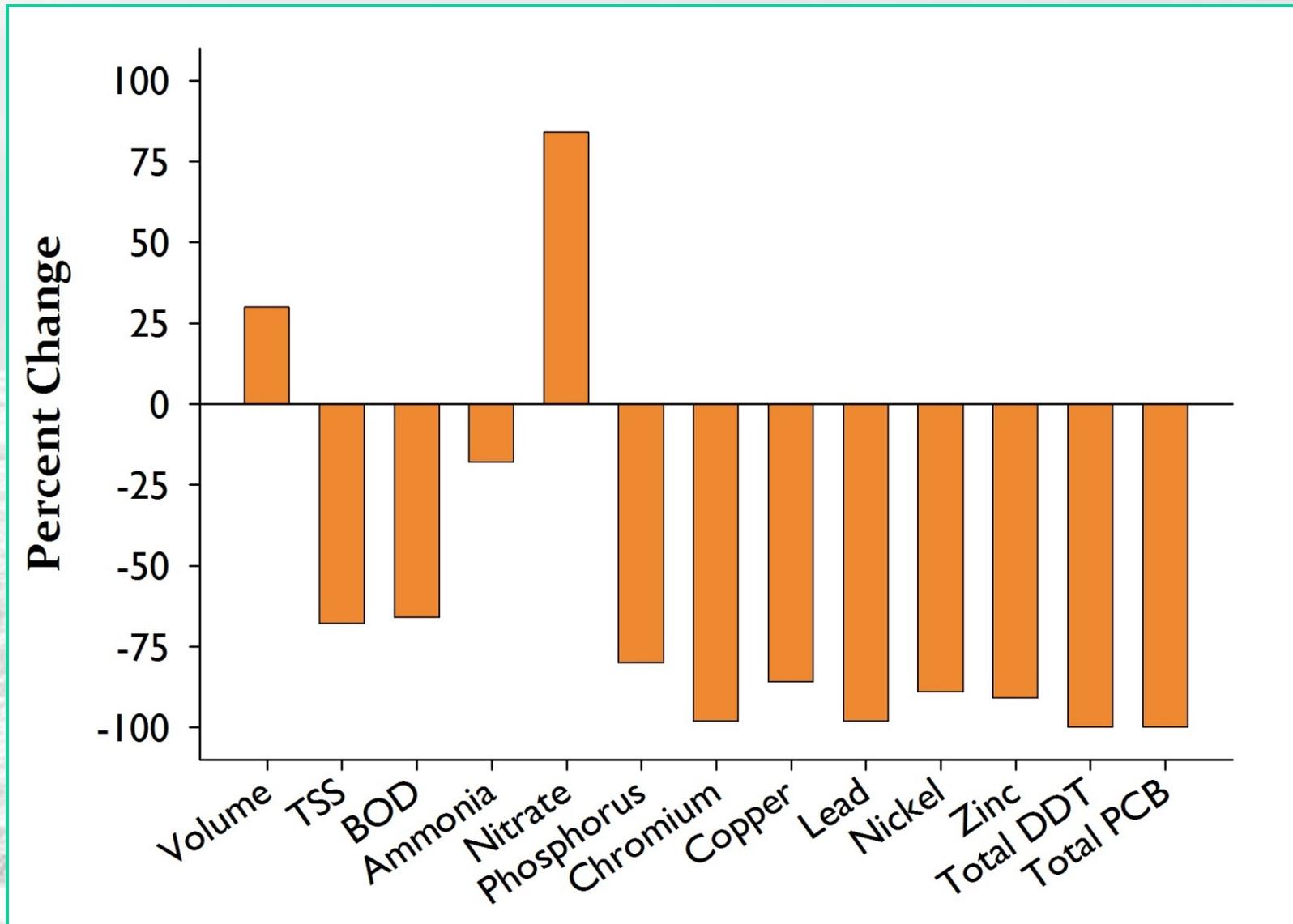
# Some Simple Questions

- **How have pollutant inputs changed?**
- **Is it safe to swim?**
- **Is it safe to eat fish?**
- **Is the ecosystem protected?**
- **What were the costs and benefits?**

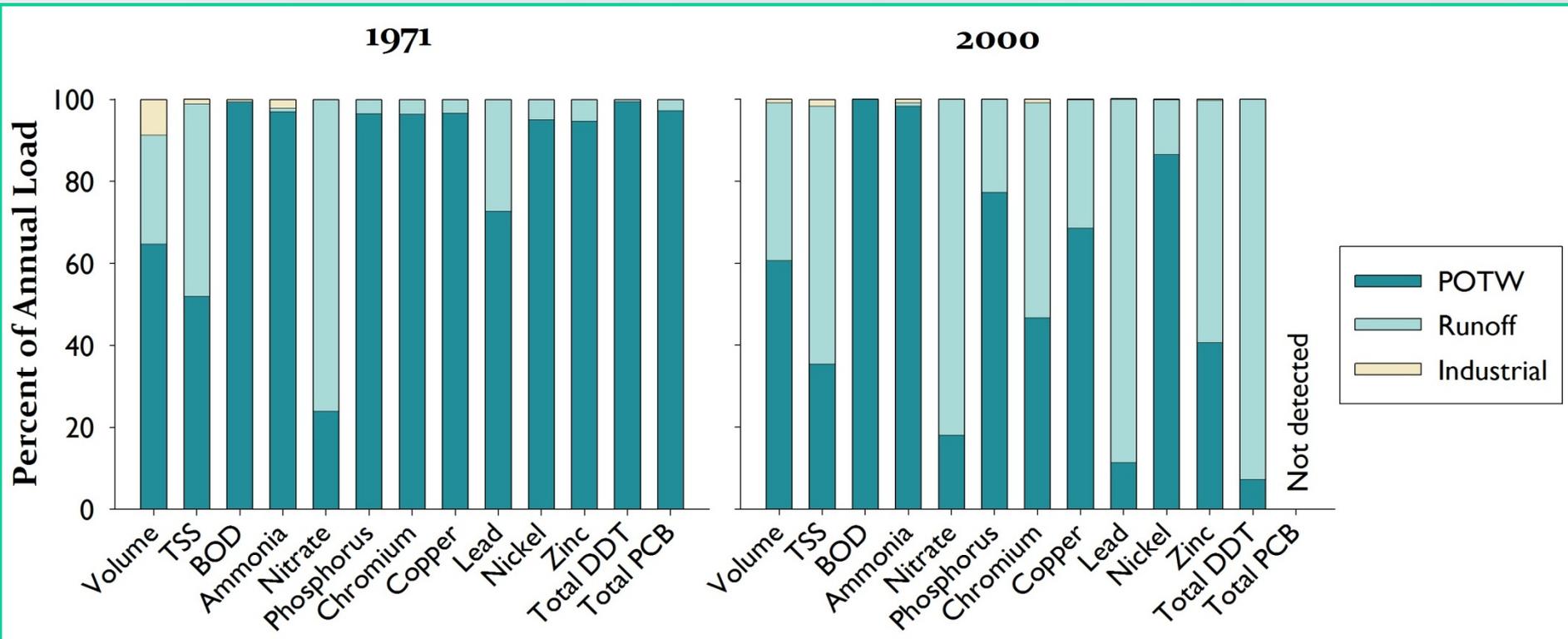


# **How Have Pollutant Inputs Changed?**

# Pollutant Inputs Have Declined Dramatically

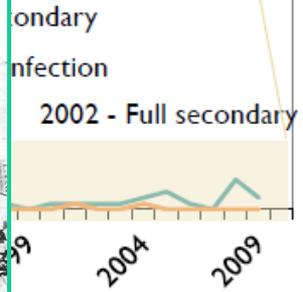
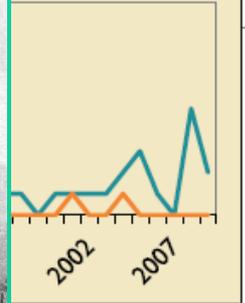
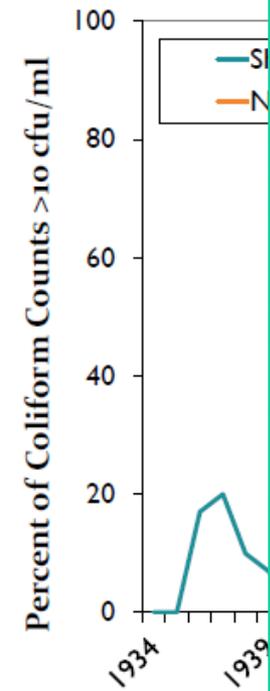


# Runoff Has Become a Principal Contributor for Some Pollutants



A wide-angle photograph of a beach scene. The sky is filled with heavy, grey clouds, and the sun is visible as a bright, hazy spot in the upper left corner. The ocean stretches across the middle ground, with waves breaking in the distance. The water in the foreground is choppy and greyish. The overall mood is overcast and somewhat somber.

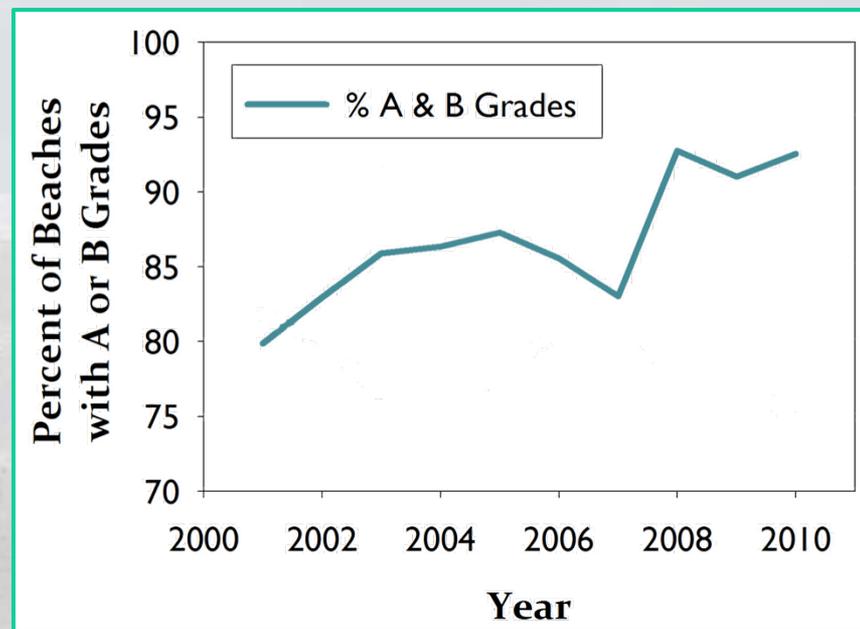
**Is It Safe To Swim?**



**Many Improvements pre-dated the CWA**

# Runoff-Associated Problems Remain, but Are Improving

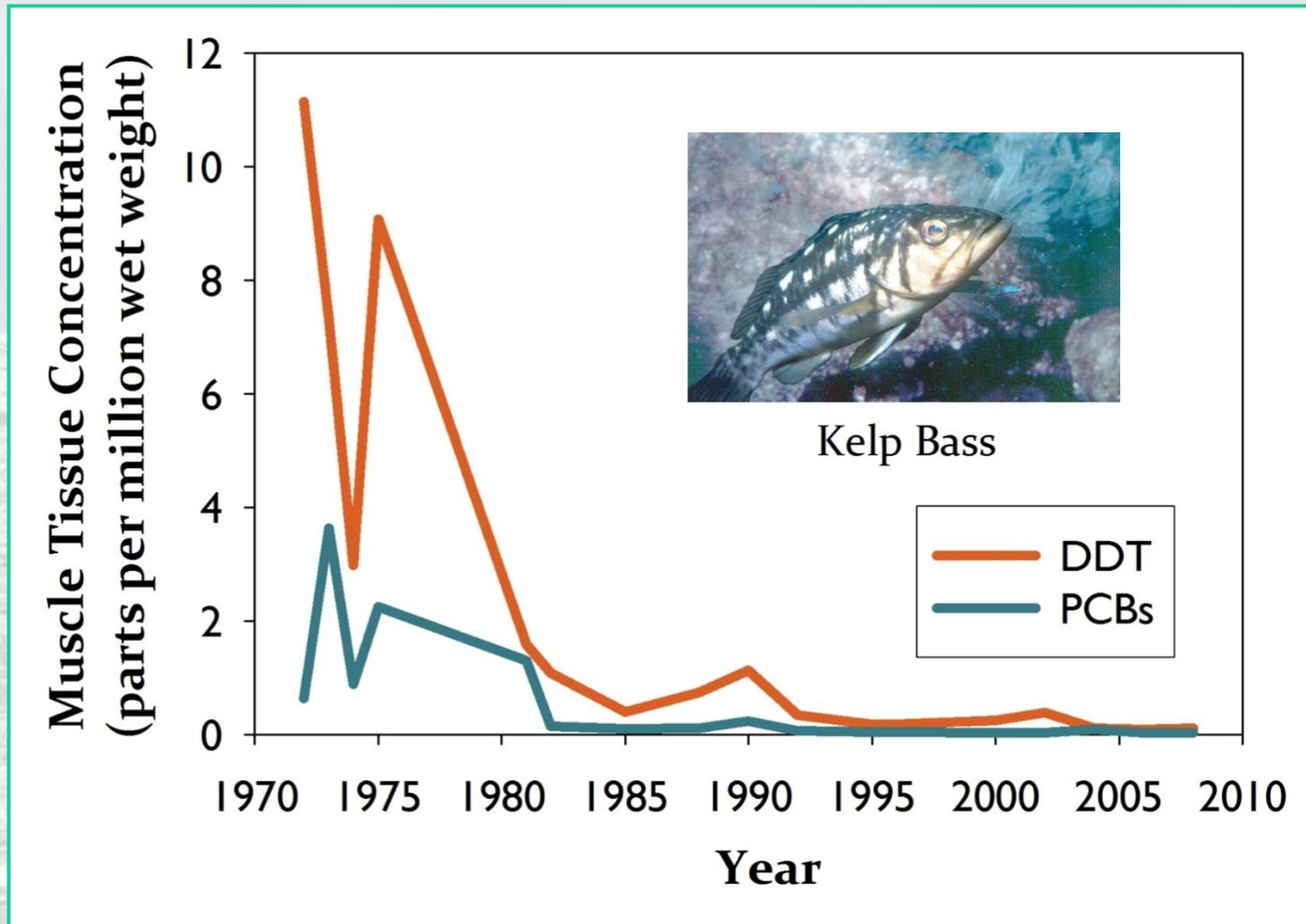
- Dry weather beach grades have improved with increasing investment in diversions and other best management practices
- Still generally unsafe to swim near river mouths and storm drains during wet weather





**Is It Safe To Eat Fish?**

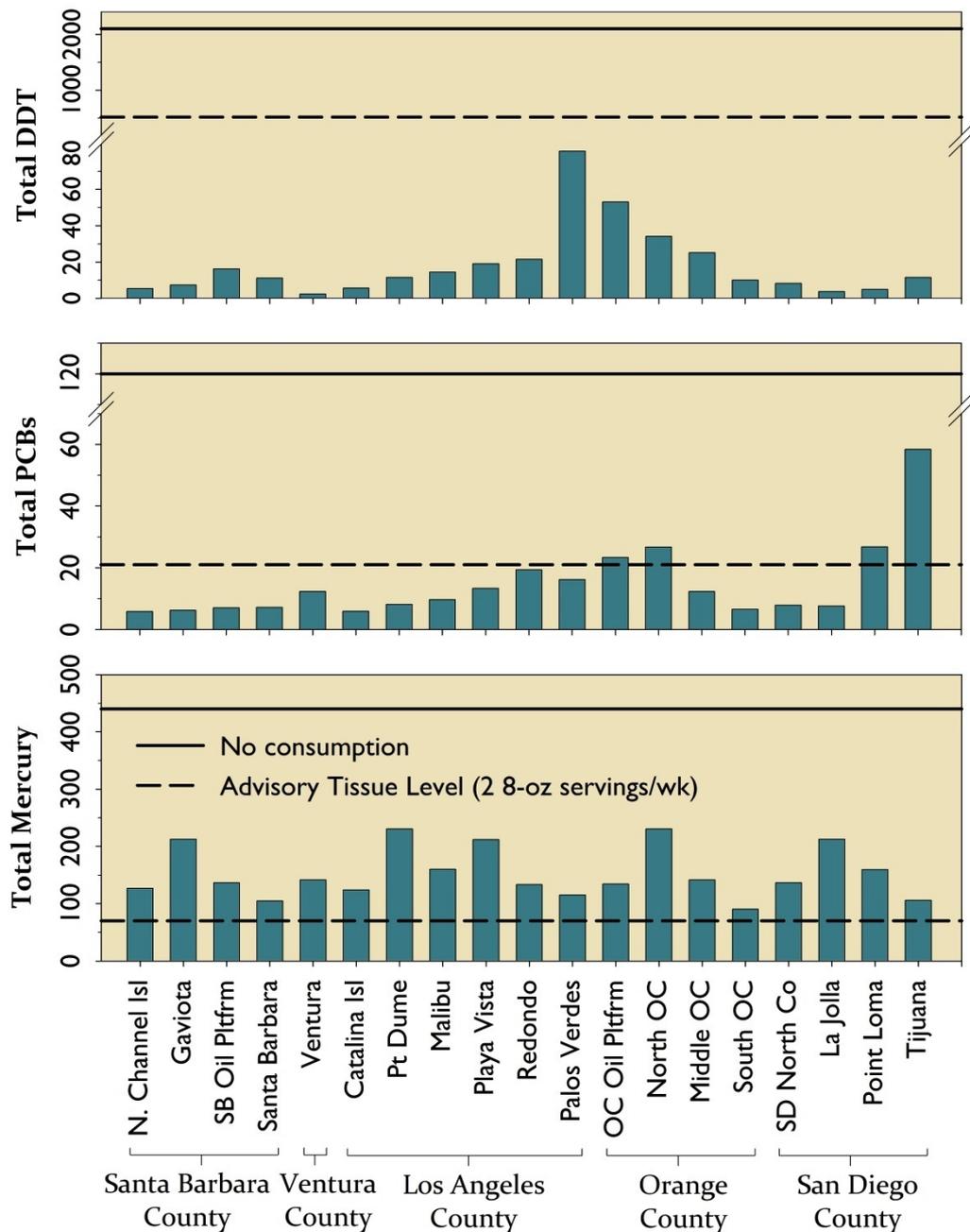
# Fish Tissue Contamination Has Been Reduced with Declining Pollutant Inputs



# Current Concerns Stem from Widespread Moderate Mercury Contamination



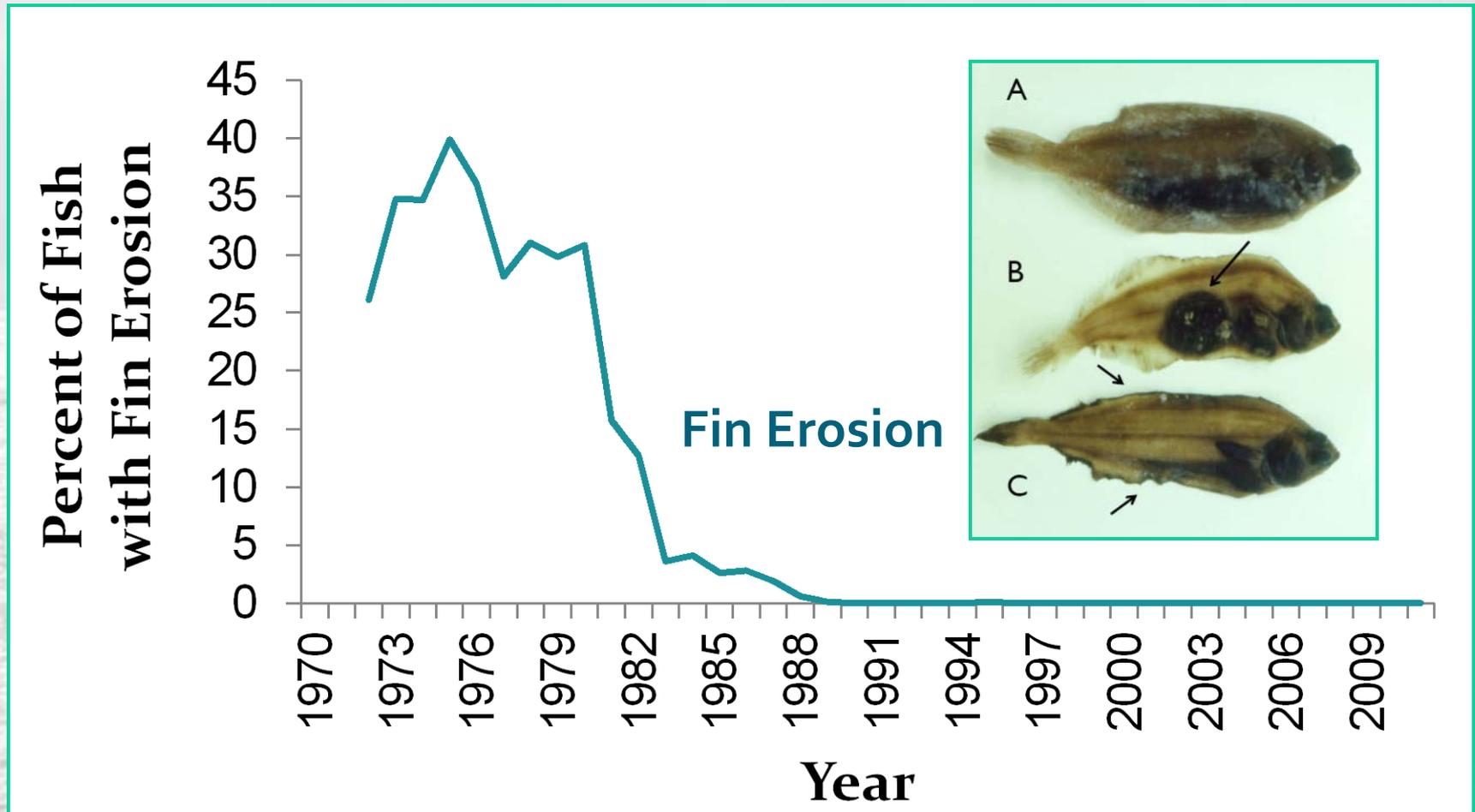
Fish Tissue Levels (ng / wet g)



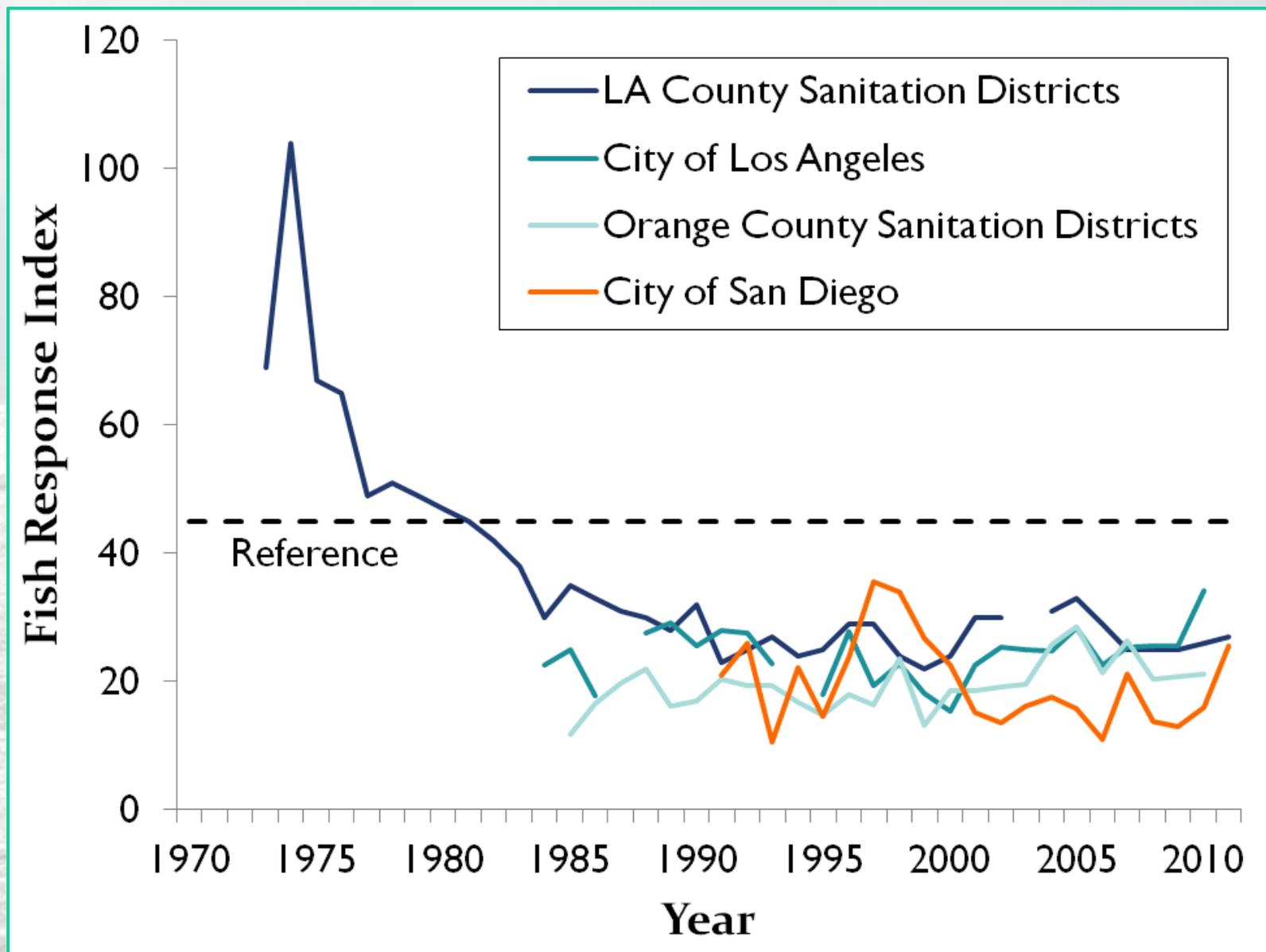
A wide-angle photograph of a vast ocean under a heavy, overcast sky. The water is a muted, greyish-blue color, with small waves visible across the surface. The horizon line is straight and divides the image roughly in half. The overall mood is somber and atmospheric.

**Is the Ecosystem Protected?**

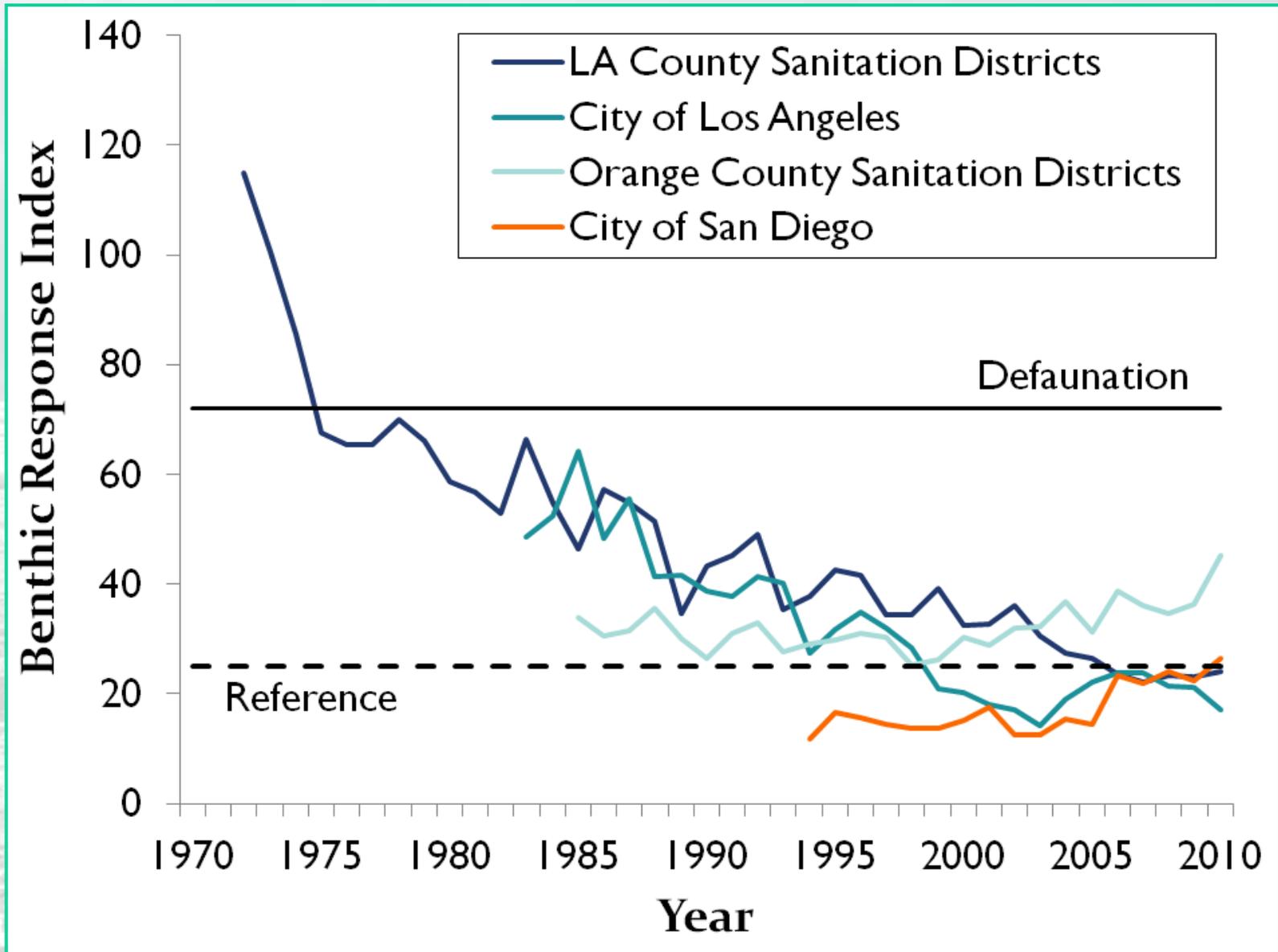
# Biological Communities Have Improved Substantially in Some Cases



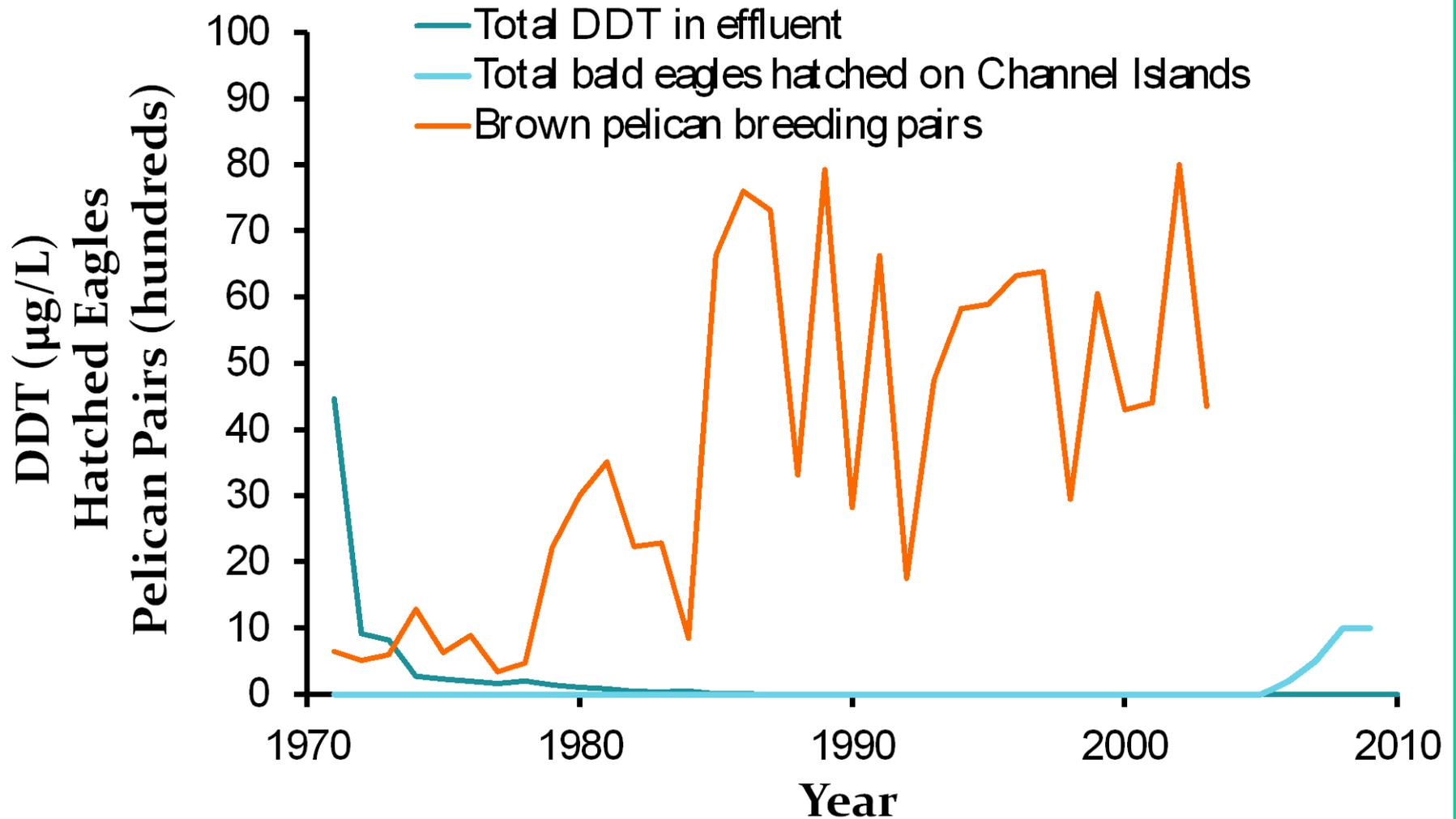
# Fish Response Index



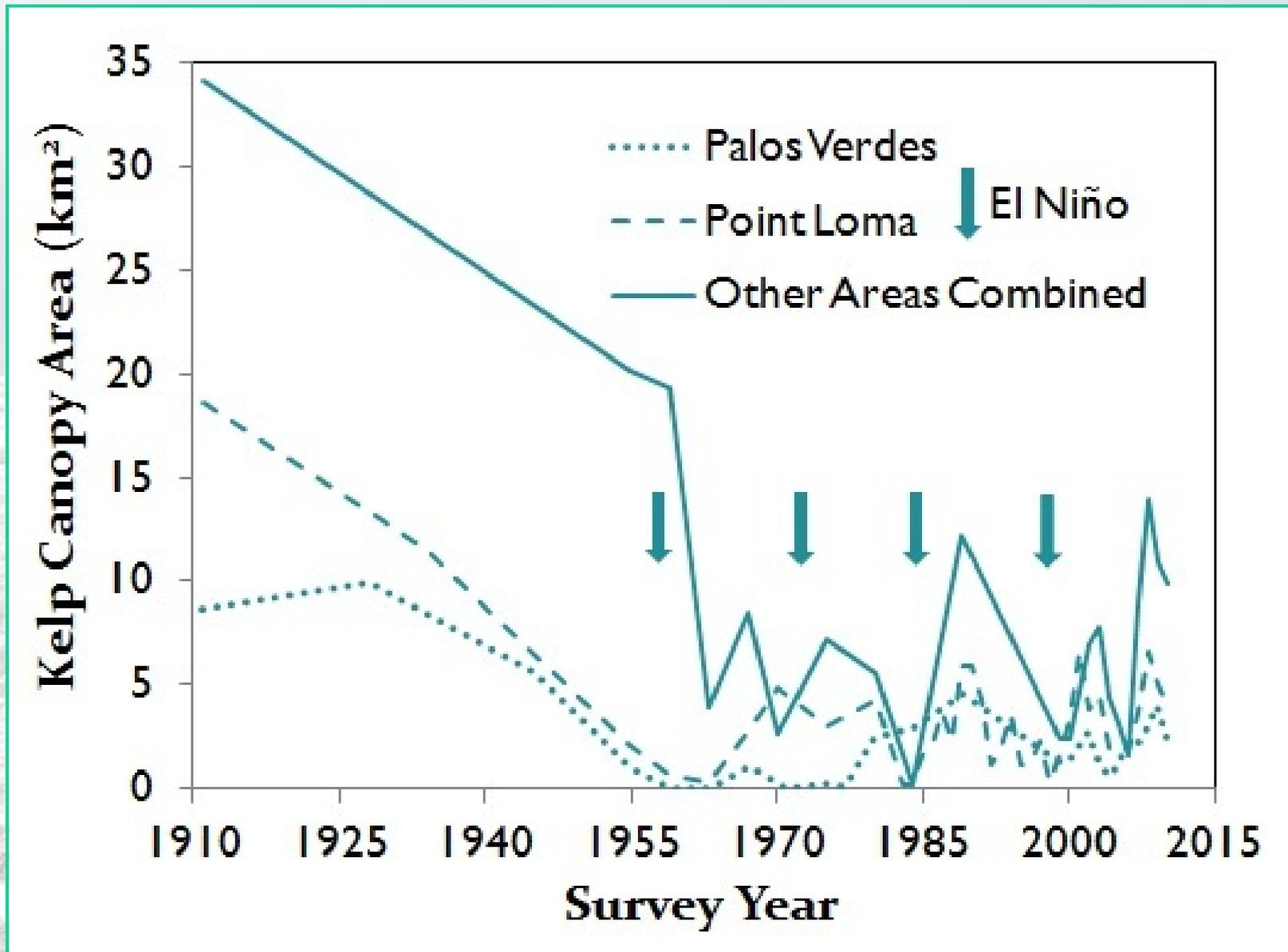
# Benthic Response Index



# Birds



# Not All Impacts Are From Water Quality



A wide, overcast ocean scene with a cloudy sky and a horizon line. The water is a muted, greyish-blue, and the sky is filled with soft, diffused light from an overcast day. The horizon is a straight line across the middle of the frame, separating the sea from the sky. The overall mood is calm and somewhat somber.

**What Were the Costs and Benefits?**

# What Do We Know?

- **Costs were/are substantial**
  - **Recent annual budgets:**
    - Large sanitation district ~ \$600 million
    - County stormwater agency ~ \$85 million
    - State Water Board ~ \$81 million
- **Benefits were/are substantial**
  - **Statewide annual ocean-dependent economic activities ~ \$22 billion**
    - Recreation and tourism ~ \$12 billion
- **Ripe area for further research**

# Future Challenges Relate to Cost...

- **Aging infrastructure places a cost burden on future generations**
  - Much of pipe network, etc. built over 50 years ago
- **Fewer federal dollars**
  - Cost transference to state and local entities
- **Less funding for runoff programs**
  - Federal grants were available for CWA-related wastewater treatment plant upgrades

# ...and Unique Management Challenges

- **Much of past legislation deals with past issues**
  - Local point sources and (later) large stormwater discharges
- **Emerging issues will require new ways of thinking**
  - Ocean acidification (CO<sub>2</sub>)
    - Larger-scale, diffuse, global sources
  - Emerging contaminants
    - Different types of toxic effects

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**(Technical Report 727)**

