

Has the Clean Water Act Been Successful?

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

Ken Schiff

California Water Quality Monitoring Council

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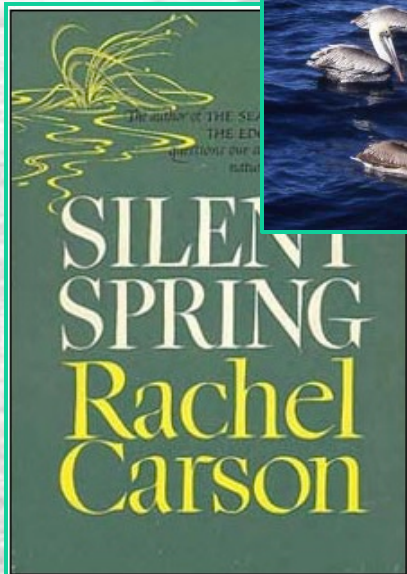


40 Years Ago: Many Changes in Perceptions and Environmental Regulations

- 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



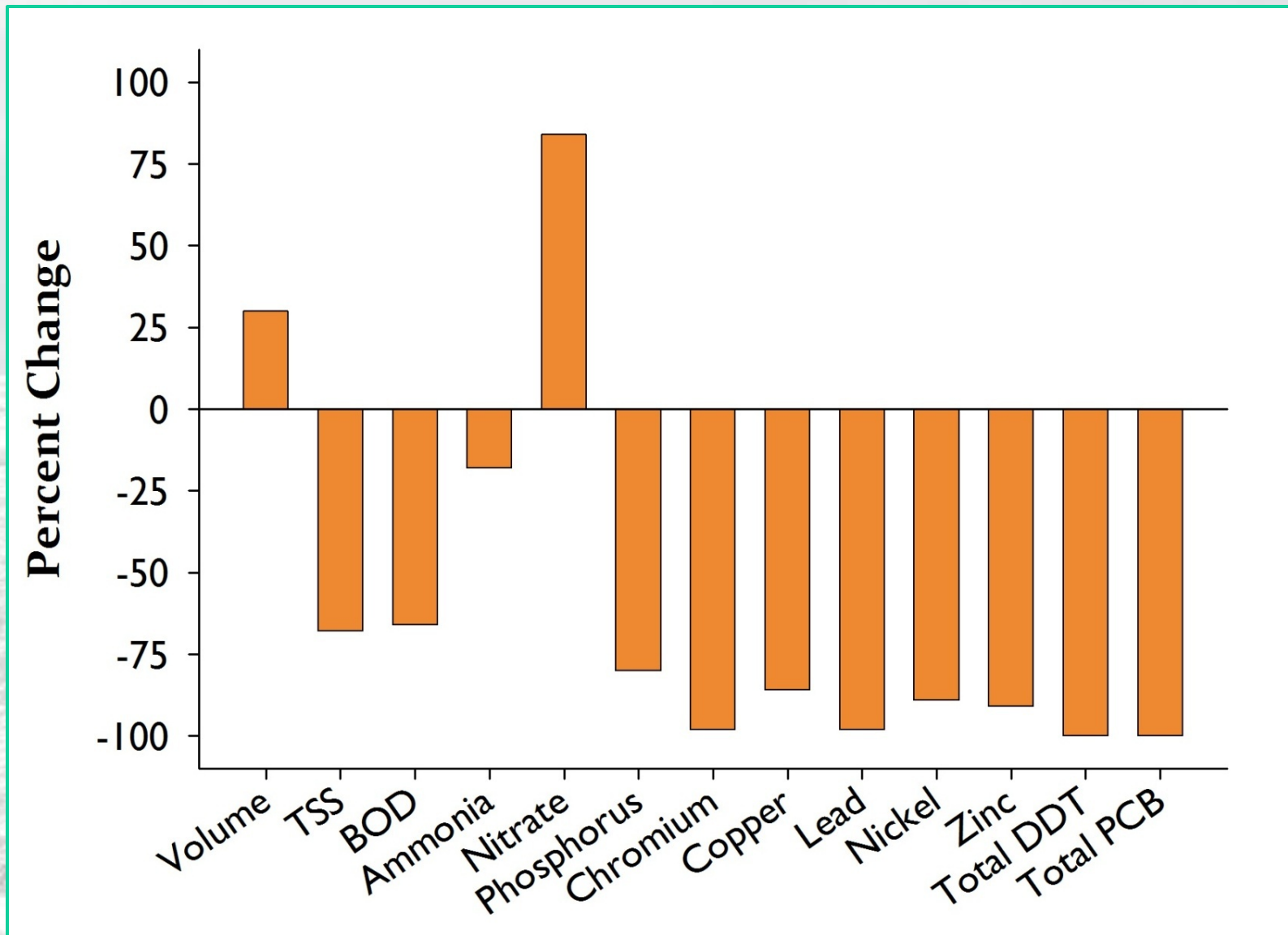
Some Simple Questions

- 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?

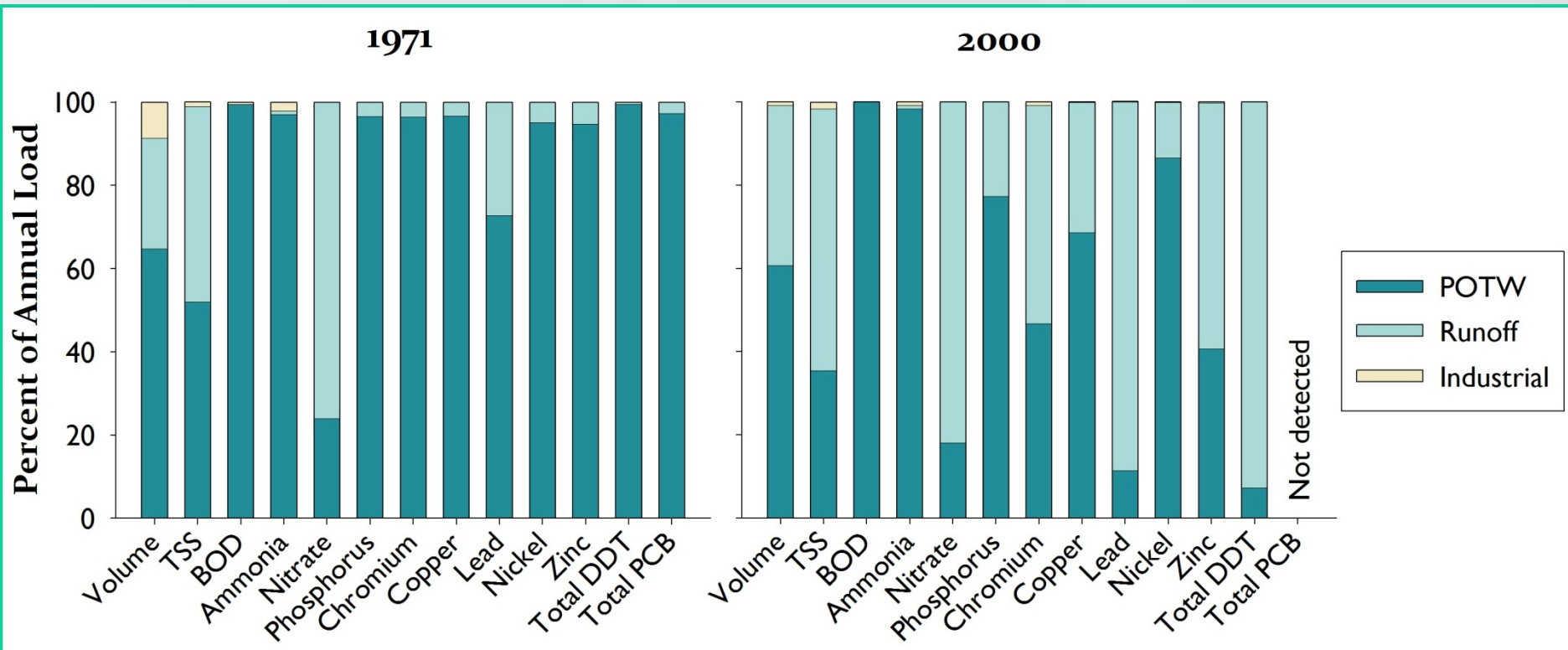
The background image shows a vast, flat landscape under a heavy, overcast sky. The horizon line is low, and the ground appears to be a mix of light and dark patches, possibly sand, mud, or sparse vegetation. The overall tone is muted and atmospheric.

How Have Pollutant Inputs Changed?

Pollutant Inputs Have Declined Dramatically

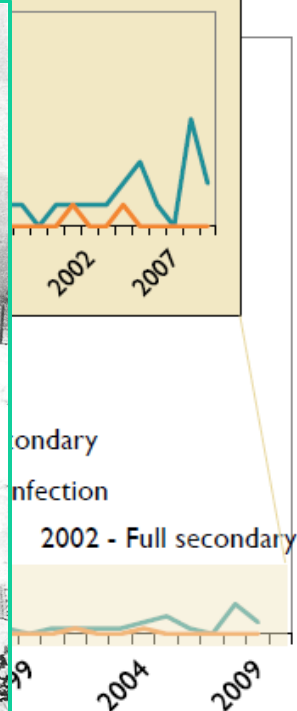
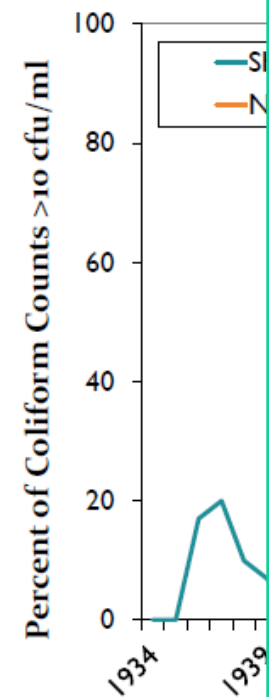


Runoff Has Become a Principal Contributor for Some Pollutants





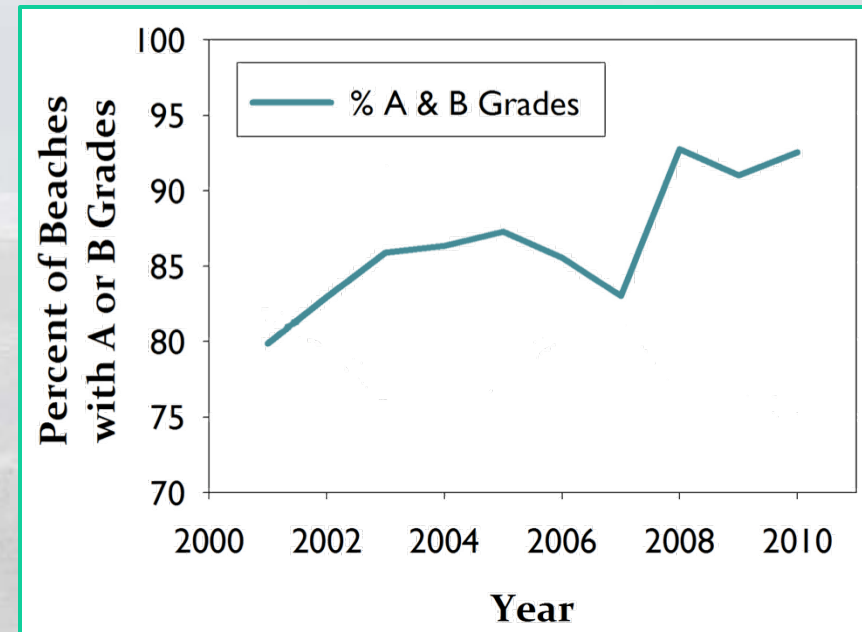
Is It Safe To Swim?



Many Improvements pre-dated the CWA

Runoff-Associated Problems Remain, but Are Improving

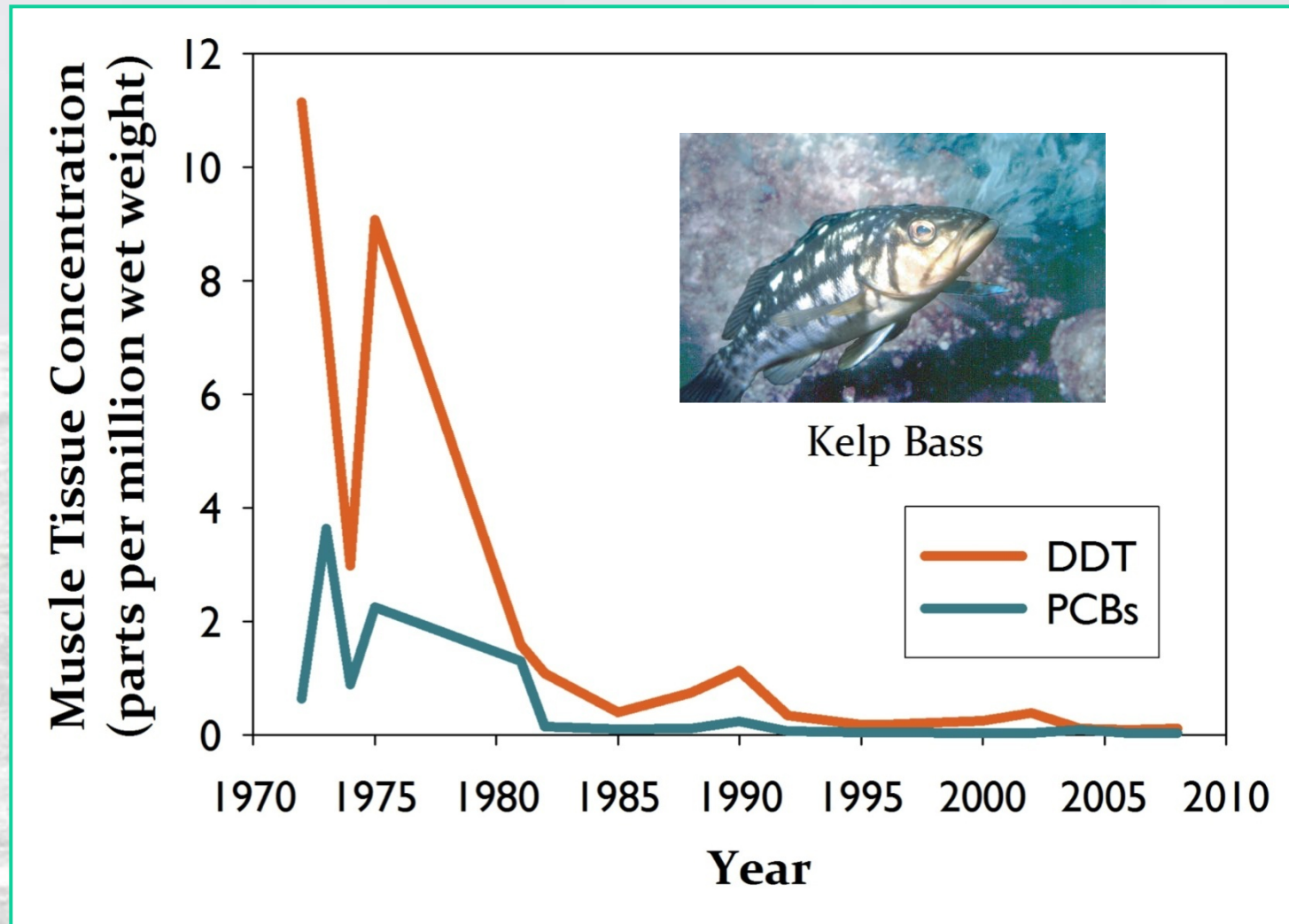
- Dry weather beach grades have improved with increasing investment in diversions and other best management practices
- Still generally unsafe to swim near river mouths and storm drains during wet weather



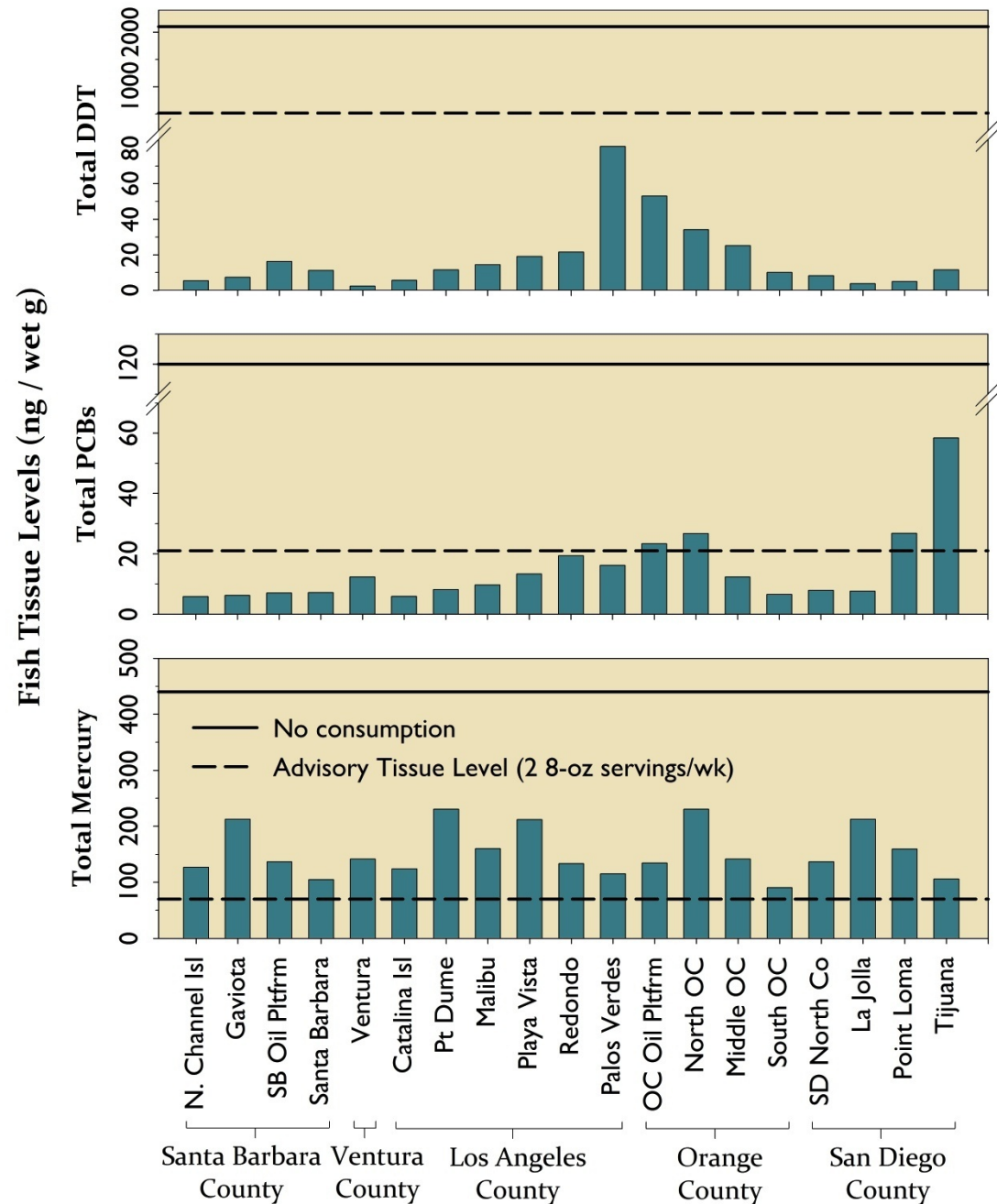


Is It Safe To Eat Fish?

Fish Tissue Contamination Has Been Reduced with Declining Pollutant Inputs



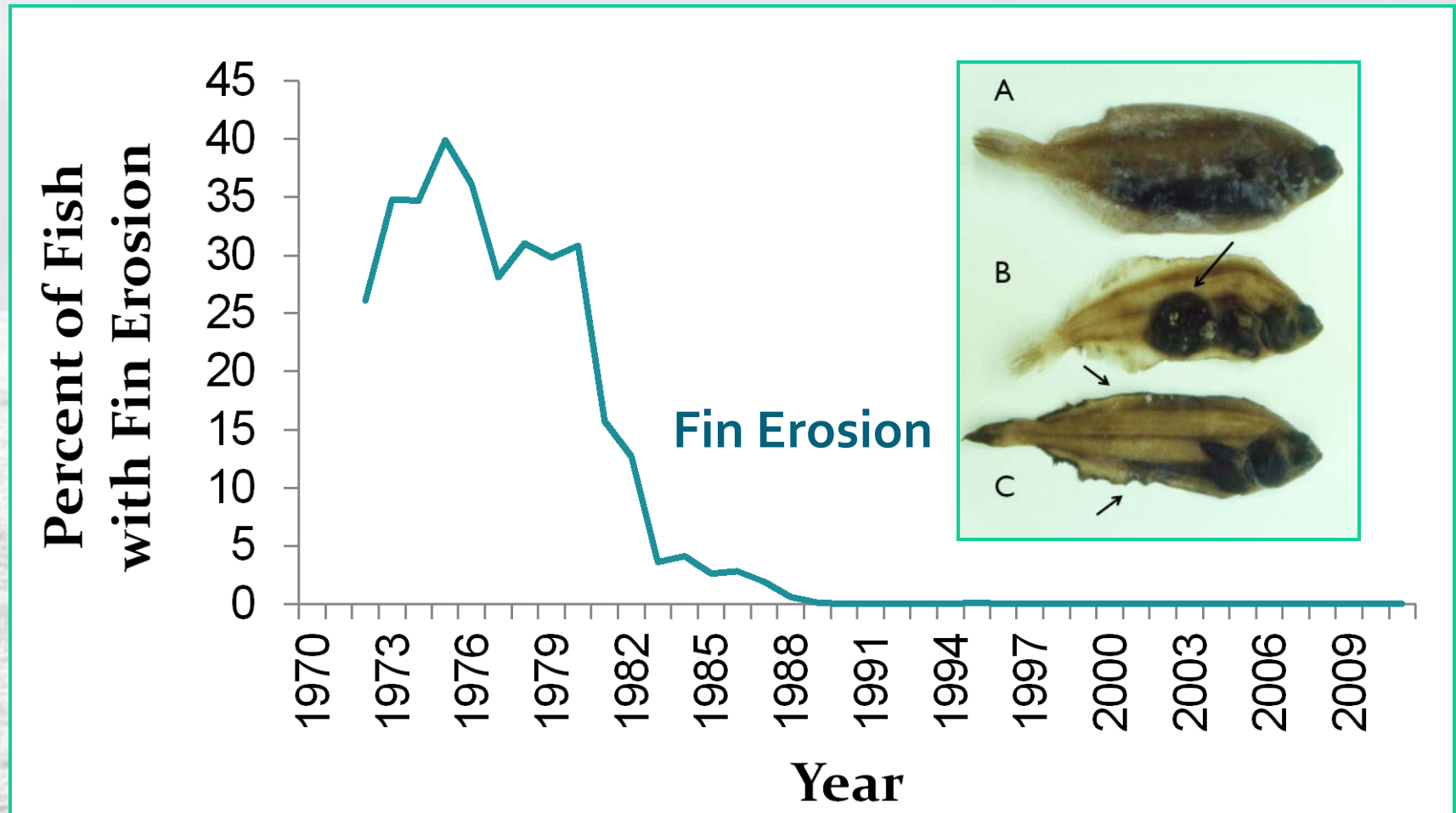
Current Concerns Stem from Widespread Moderate Mercury Contamination



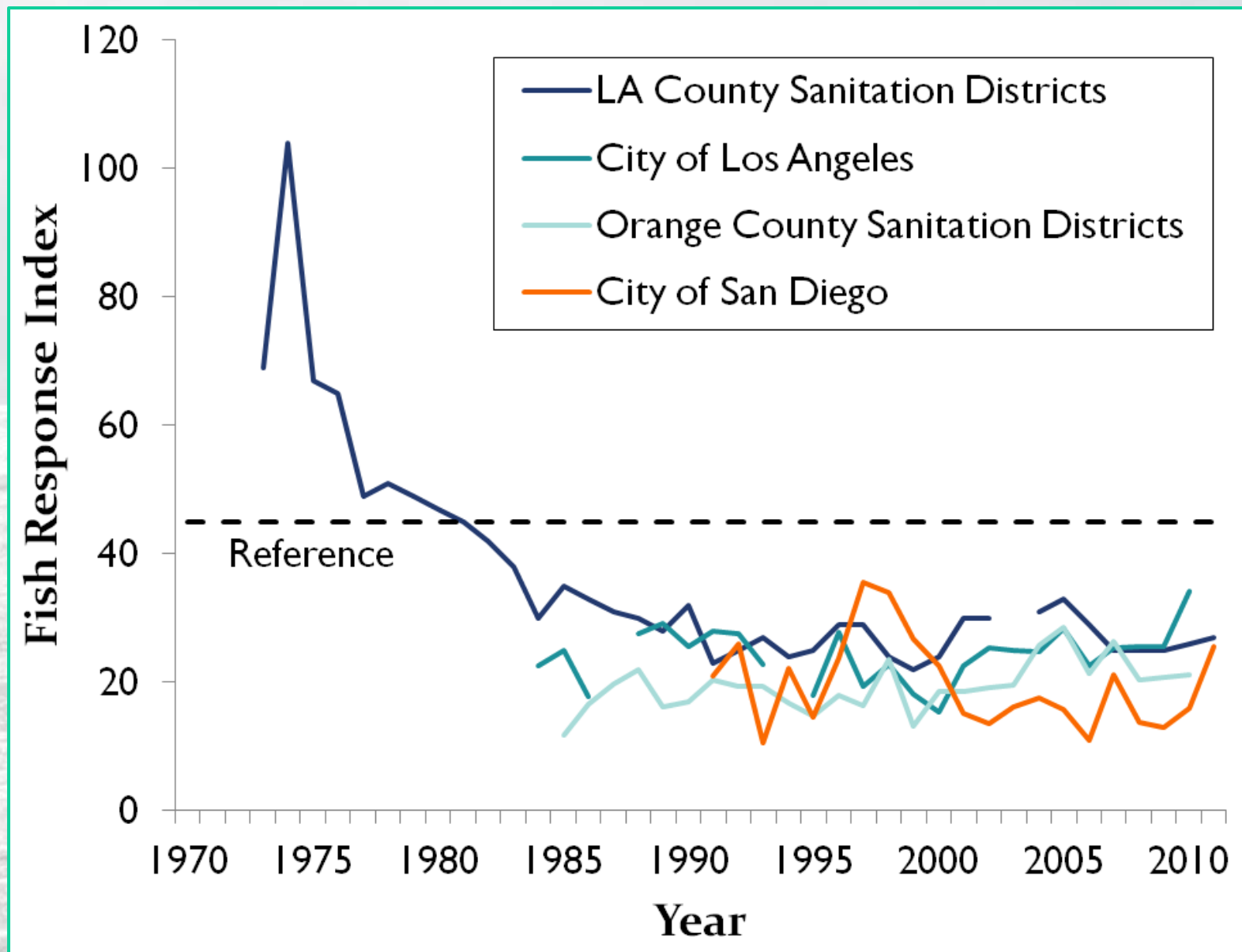
The background image shows a vast, flat landscape, likely a coastal plain or a large field, under a heavy, overcast sky. The horizon is low, and the ground appears to be covered in low-lying vegetation or grass. The overall tone is muted and atmospheric.

Is the Ecosystem Protected?

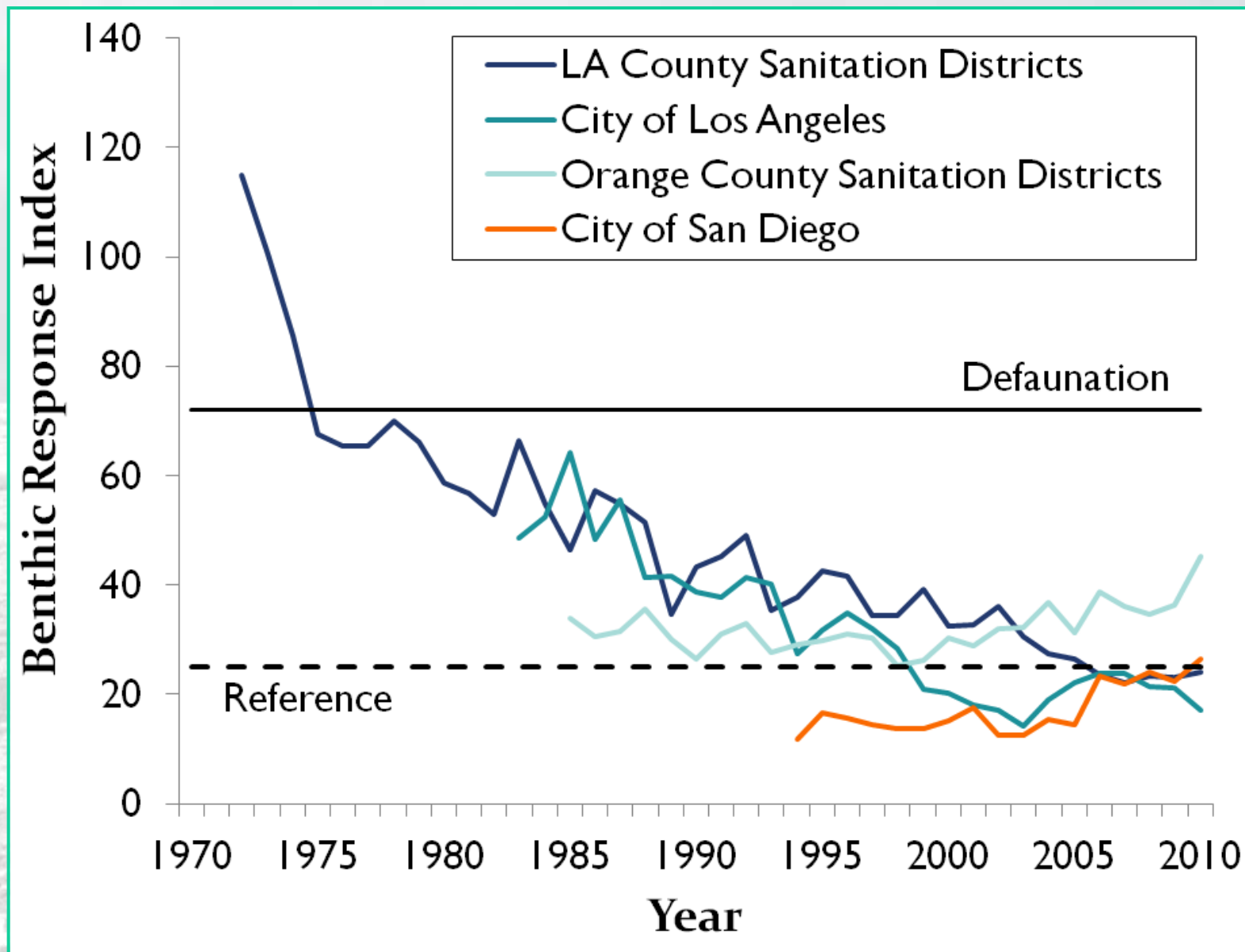
Biological Communities Have Improved Substantially in Some Cases



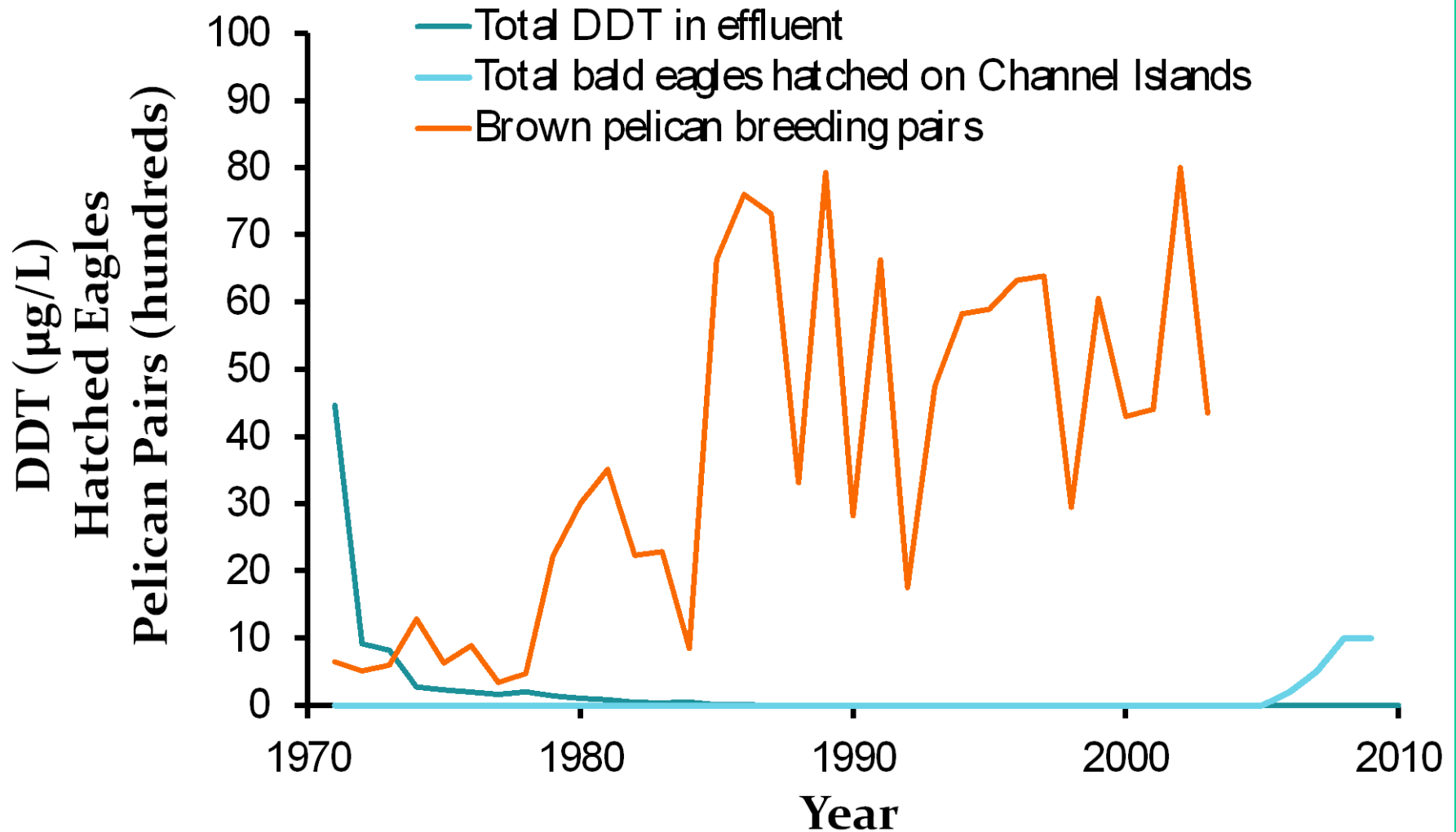
Fish Response Index



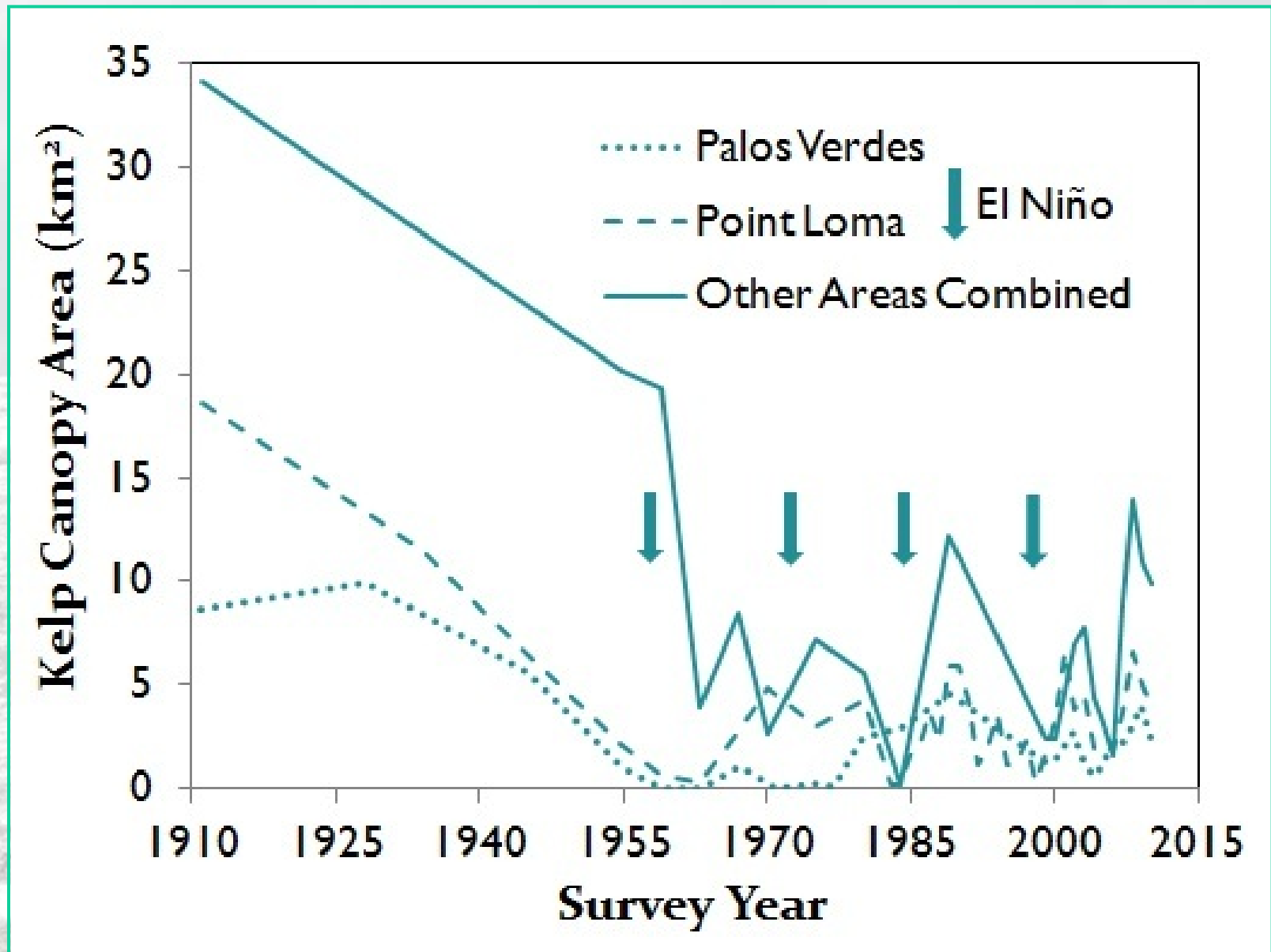
Benthic Response Index



Birds



Not All Impacts Are From Water Quality





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 (CO₂)
 - Larger-scale, diffuse, global sources
 - Emerging contaminants
 - Different types of toxic effects

To download report:
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(Technical Report 727)

