

## **Networking for Community Health**

# **OCEAN WATER QUALITY AND COMMUNITY HEALTH IN IMPERIAL BEACH**

### **Summary of Results for the Health Risk Assessment for Consumption of Fish Caught at the Imperial Beach Pier**



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Primary Research Authors of the Health Risk Assessment for Consumption of Fish Caught at the Imperial Beach Pier are Malory Houk, Rick Gersberg, Ph.D. of the San Diego State University Graduate School of Public Health.

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# Summary of Results for the Health Risk Assessment for Consumption of Fish Caught at the Imperial Beach Pier

## Introduction

The Imperial Beach Pier (IBP), a major landmark on the coastline of Imperial Beach, serves as the central location for fishing in Imperial Beach. The question addressed here is whether polluted water flowing up the coast from the Tijuana River mouth could be negatively affecting the quality of the fish consumed by anglers and their families, and whether consuming the fish could be affecting their health. Research of this kind has not been done for this coastal area. Some fishers (who eat pier-caught fish daily) may be at an increased risk from adverse health effects because they consume larger quantities of fish than other members of the population, and the fish they catch are not subject to inspections from the Food and Drug Administration (FDA) or other organizations. These adverse health effects depend very much on the particular chemical(s) that has accumulated in the fish, but in the case of mercury, may include neurological or fetal developmental effects (for pregnant women), and for chlorinated compounds like pesticides, may include adverse outcomes like cancer.

It is the responsibility of state and local government to protect their constituents by issuing fish consumption advisories for any areas that have measured elevated levels of toxic chemicals in local water bodies. These advisories serve as warnings for those fishing in certain contaminated bodies of water, and as such, the findings from this study have important implications to regulators as to whether to post advisories for fish consumption at Imperial Beach.

## Methods

Our investigation was conducted to determine whether fish caught and eaten from the waters off of the IBP are exerting a health risk to fishers who consume all or parts of these fish. For this study, 18 fish (representing 9 different species of fish) were collected from the Imperial Beach Pier, and analyzed for toxic heavy metals including mercury, chlorinated pesticides, and PCBs. The risk assessment conducted follows risk assessment procedures first developed by the National Academy of Sciences and was based upon EPA's *Guidance for Assessing Chemical Contaminant Data for Use in Fish Advisories: Vol. 2. Risk Assessment and Fish Consumption Limits* (3<sup>rd</sup> ed.).

## Results and Conclusions

### Arsenic and Mercury

Results are first presented here for chemicals in the fish which may be hazardous to one's health, but are non-carcinogenic (cancer-causing). Examples of these chemicals that we detected are arsenic and mercury. For these chemicals, we found that at average levels of fish consumption (a little over one-half pound per week), there is an insignificant risk (above background) for these toxic elements. Moreover, we found that the levels of arsenic and mercury in the fish caught at Imperial Beach Pier are for the most part, lower than levels one would find in most commercial cans of tuna fish (for mercury) or filets of marine fish sold at local supermarkets (for arsenic). As such, the risk associated with arsenic can be likened to a "natural" risk that is associated with eating many types and varieties of commercially caught marine fish, and cannot be directly linked to pollution sources from the Tijuana River. Similarly, it is well known that mercury has accumulated to high levels in a wide variety of marine fish such as commercially-sold tuna, swordfish and shark, and the levels we measured in fish caught at IBP are well below these levels of concern (e.g FDA action level of 1.0 ppm).

**DDT and Total PCBs**

DDT is a pesticide that was used widely in the United States in the 1950's and 60's. Its use declined in Mexico in the early 1980's and was halted there in 2002. PCB's (Polychlorinated biphenyls) were man-made organic chemicals manufactured in the US from 1929 to 1979, and used in a wide variety industrial and commercial products. In 1979 it was banned in the US. DDTs and PCBs are what is know as "legacy chemicals" because they are no longer manufactured and used but they are still present in the environment.

Our assessment showed potential carcinogen risk values above a level of concern (a risk probability of greater than one in one hundred thousand as per California Proposition 65) only at very high ingestion rates (more than 5 ounces a day, on a nearly daily basis for many decades) for total DDTs and for total PCBs. Although these chemicals do still exert some degree of risk at present for high-rate consumers of Imperial Beach Pier fish (at the subsistence level), the presence of these chemicals continues to decline in both Mexico and the U.S. and the concentrations of these "legacy" chemicals in the environment (specifically within the Tijuana River watershed) should continue to decline as well, and their risk to present and future fishers at Imperial Beach Pier should soon fall to levels below any significant public health concern.