Influence of Media Reporting on U.S. Demand for Farmed Salmon

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Issue

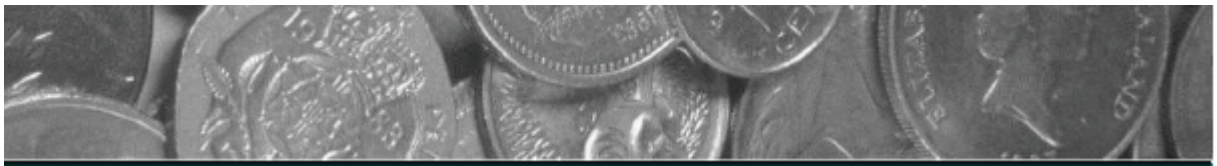
- Release in January 2004 of an article in the journal *Science* regarding contaminant polychlorinated biphenyls (PCBs) in farmed salmon

- Precipitated a significant amount of a) media interest; and, b) subsequent presentation of findings of this study as fact, pervasive throughout media to date

- What was the precipitating study?

  - Hites, R.A., J.A. Foran, D.O. Carpenter, M.C. Hamilton, B.A. Knuth, and S.J. Schwager. 2004. Global Assessment of Organic Contaminants in Farmed Salmon. *Science* 303:226-229.

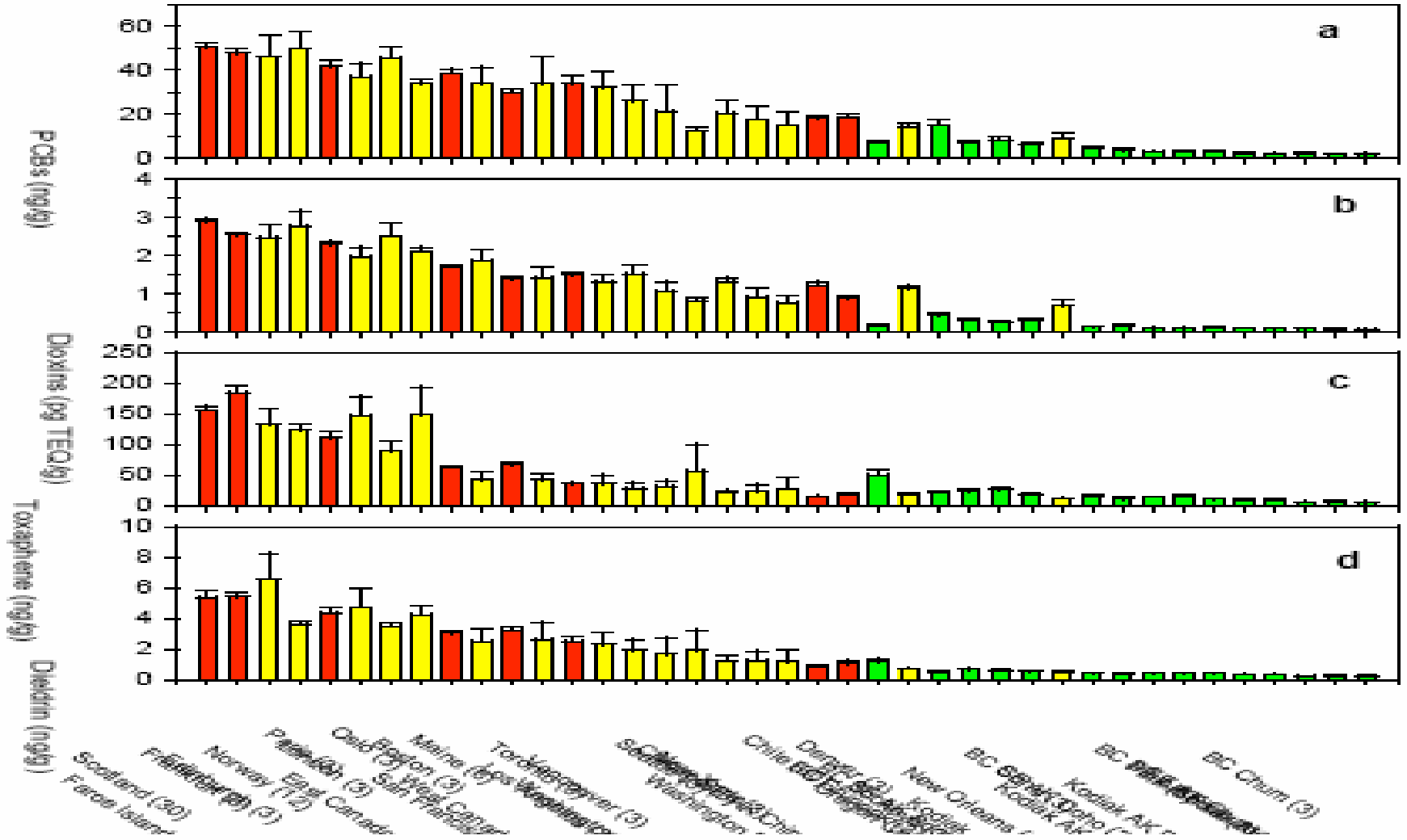
Presentation by Dr. David Carpenter – *Science* study author



- We purchased 459 whole farmed salmon from 51 farms in eight farming regions in six countries (Scotland, Norway, Faroe Islands, Eastern Canada, Maine, Western Canada, Washington State, Chile).
- We purchased 135 wild Alaskan salmon, including chum, coho, chinook, pink and sockeye, from suppliers in Alaska and Western Canada.
- We purchased salmon fillets in supermarkets in 16 North American and European cities (Vancouver, Seattle, Los Angeles, San Francisco, Denver, Chicago, Toronto, New Orleans, Washington, D.C., New York, Boston, London, Edinburgh, Paris, Frankfurt, Oslo).
- Composites of three fish or three fillets (for a total of 246 samples) were analyzed for 14 organic contaminants, nine metals and lipids.

Seafood Summit, Seattle, WA, January 2006

Presentation by Dr. David Carpenter – *Science* study author



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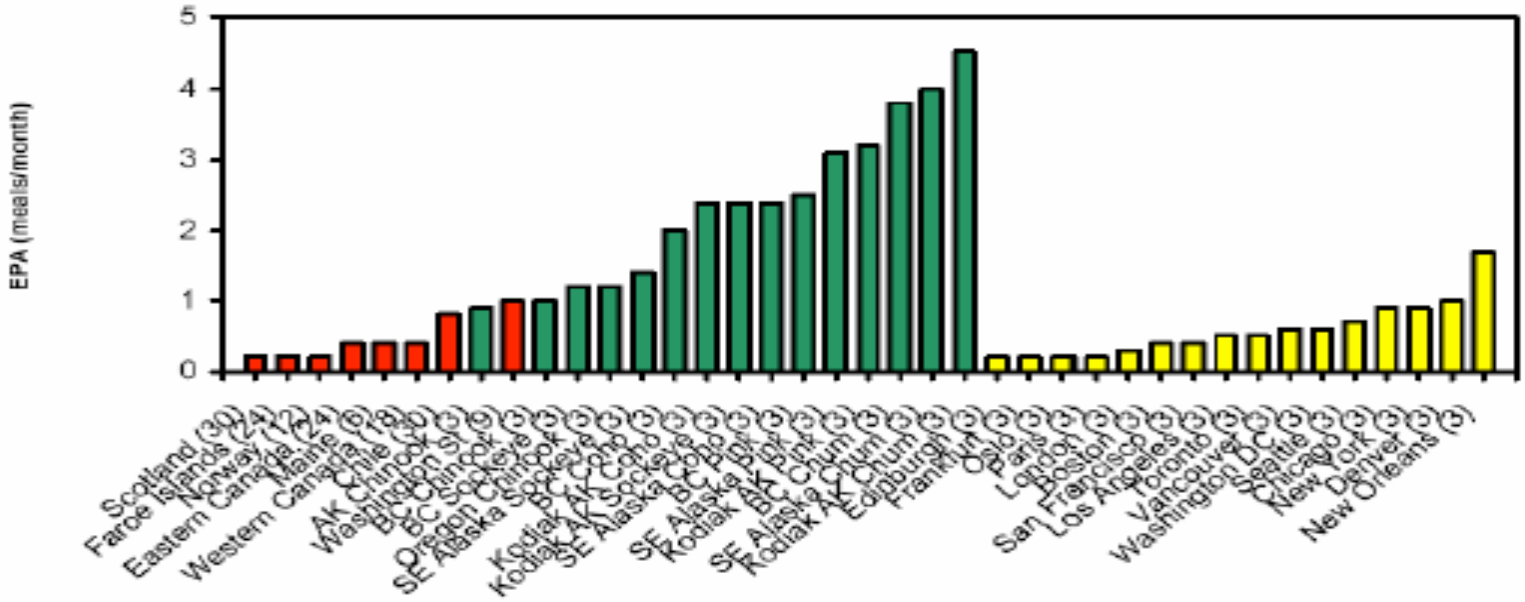

Figure 5. Consumption advisories (in meals per month) based on USEPA cumulative carcinogenic risk assessment methods for total DDT, dieldrin, total chlordane, heptachlor epoxide, lindane, hexachlorobenzene, toxaphene, PCBs and dioxins/furans for farmed salmon (red), wild salmon (green) and for retail market salmon (yellow). The country in which the salmon was produced or the city from which it was purchased is indicated. The numbers in parenthesis are the number of samples analyzed.

Seafood Summit, Seattle, WA, January 2006

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CONCLUSIONS

Farmed salmon have significantly greater levels of organochlorine compounds than do wild salmon, and the source appears to be the fish food. Farmed salmon from Northern Europe have significantly higher levels than those from North America which, in turn, are higher than those from South America.

Salmon have significant amounts of omega-3 fatty acids, but the beneficial effects of omega-3 fatty acids on sudden cardiac death must be balanced against the increased risk of cancer from the contaminants.

Using EPA cancer risk assessment methods for all of these contaminants farmed salmon from all regions studied elicited highly restrictive fish consumption advisories, while those for wild salmon are much less stringent.

Seafood Summit, Seattle, WA, January 2006

Newspaper Headlines

"Study cites toxins in farmed salmon" – *Chicago Tribune*

"Study says farmed salmon dangerous" – *Detroit Free Press*

"Toxic risks in farmed salmon – consumers told to be wary. Study finds PCBs, dioxins, pesticides, probably from diet" – *San Francisco Chronicle*

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"Toxins cited in farmed salmon. Cancer risk is lower in wild fish, study reports" – *Washington Post*

"Limit on eating salmon urged" – *St. Paul Pioneer Press*

"Some salmon are highly toxic" – *USA Today*

Counter-Arguments by Medical Professionals and Food Scientists

Risks not put into context against benefits

"…that publication likely caused substantial numbers of premature deaths.' *Am. J. Prev. Med.*

"That publication was particularly troublesome, perhaps even irresponsible, because the implied health consequences were based on hypothetical calculations and very small (lifetime risks of ≤1:10,000)." *Am. J. Prev. Med.*

"Unavoidable contaminants in all salmon – farmed and wild – are within the established guidelines… They are safe, and they are healthful." *Food Technology (Dr. Charles Santerre)*

Additional issues regarding the study

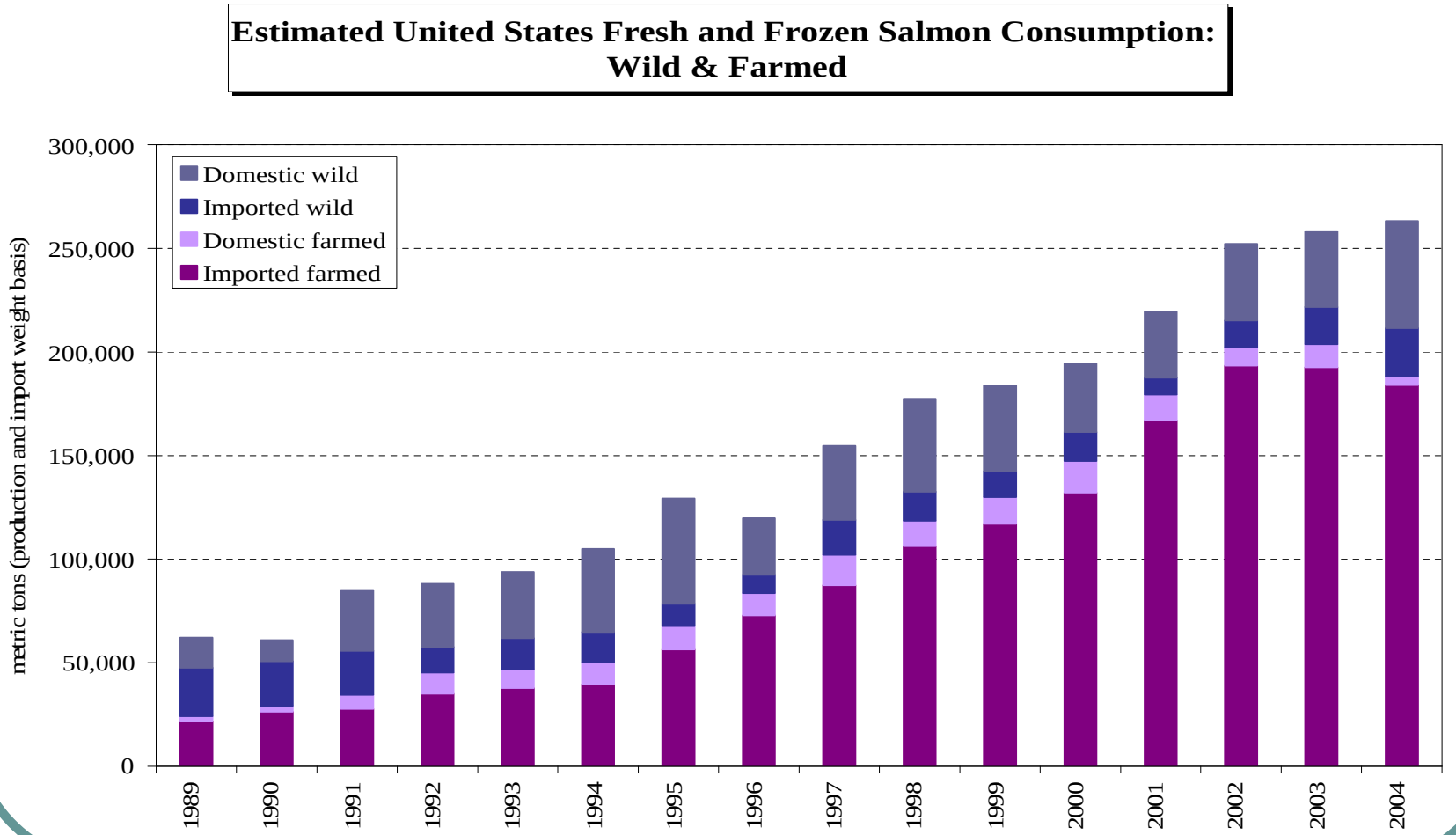
Not always clarified in media reports:

- Differences in recommendations between EPA (50 ppb) and FDA (2,000 ppb)
- Analysis done in 2001, when technology related to fish feed used in salmon aquaculture different from when study was published, which is different from current technology
- Analysis done on raw fish, skin on (cooking properly reduces contaminant level)

Additional issues regarding the study

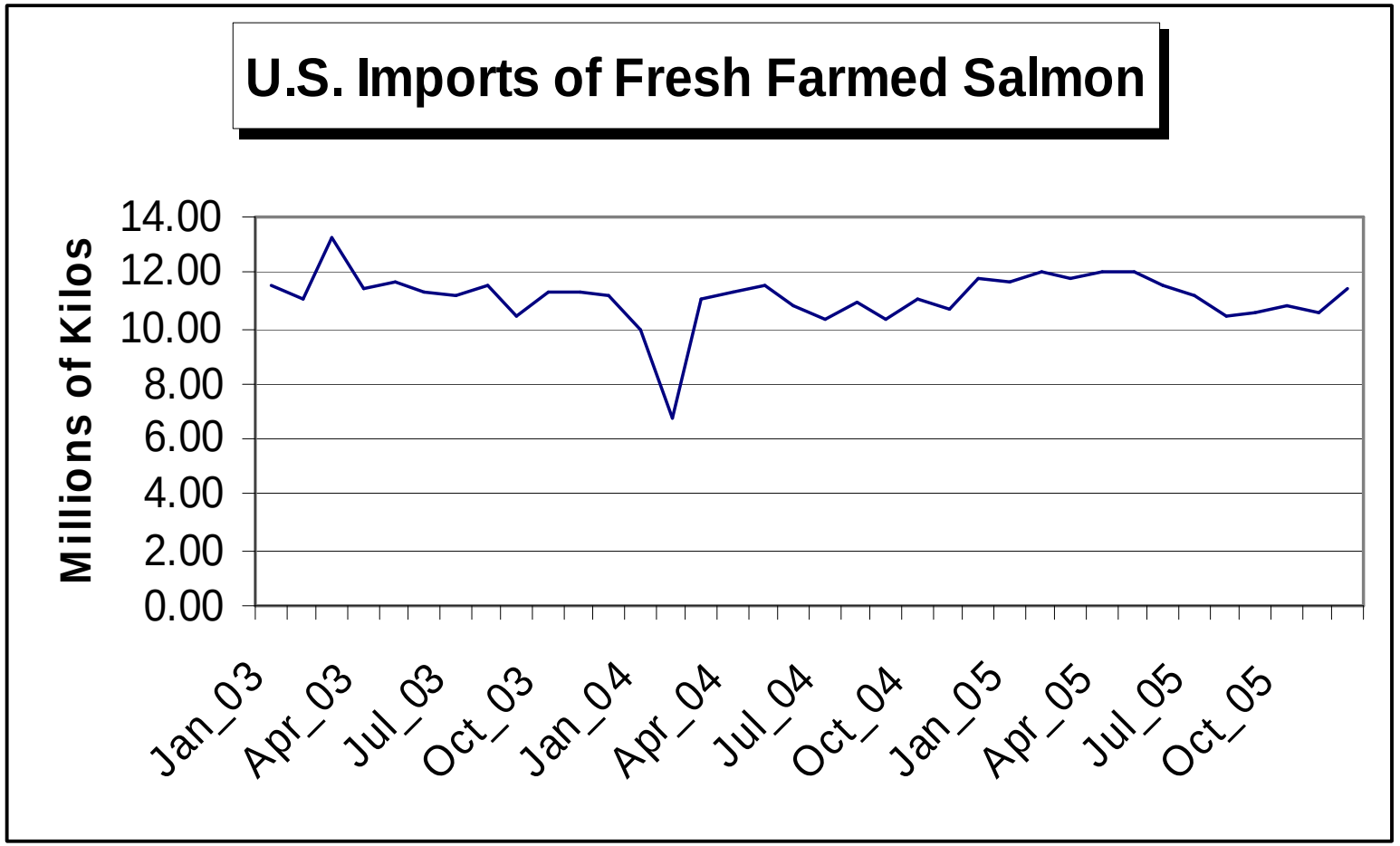
- Subsequent news articles right up to present – treats PCB research as fact
- Food section of newspapers continue to suggest wild salmon as better alternative to farmed
- "Today" show, in reporting on seafood safety, recommended consumption of wild salmon in Sept. 2007

Importance for Salmon Consumption in the U.S.



Sources: Alaska Dept. of Fish & Game; NMFS, Import Statistics – Knapp, Roheim and Anderson (2007)

U.S. Imports of Fresh Farmed Salmon

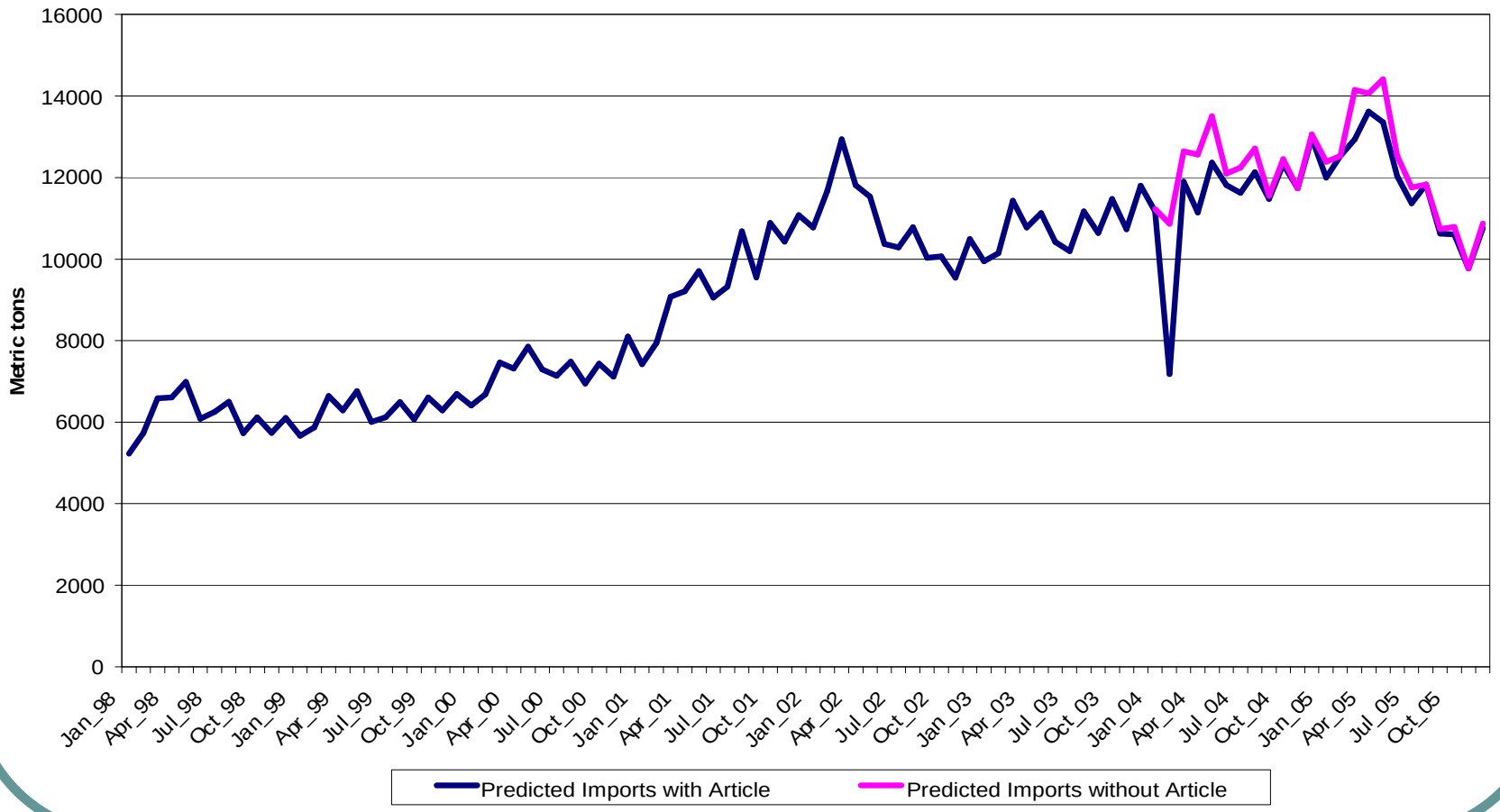


Source: NMFS, Import Statistics

Impact of Media on U.S. Import Demand for Farmed Salmon

- Regression analysis of quantities imported on a monthly basis from Jan. 1998 – Dec. 2005
- Fresh products, fillet equivalent, proxies consumer demand
- Function of economic influences and media index
- Media index based on methodology from previously published journal articles
  - Index captures pervasiveness of news and strength of the impact of the news on imports, holding all economic effects constant

Predictions of U.S. Farmed Salmon Imports with and without *Science* Article



Summary and Conclusions

- The *Science* article regarding PCBs in farmed salmon caused considerable controversy and media attention, providing ammunition to environmental groups opposed to salmon aquaculture

- Of interest to all is whether it caused and continues to cause changes in consumer demand for salmon
  - If so, what are the health implications? Are consumers inappropriately balancing health risks against benefits?

- This research shows there were at least some temporary impacts from the article and perhaps some (smaller) long run impacts, but have tapered off
  - Thus, implications are that consumers may not be reducing their consumption of salmon, with its implications for health risks and benefits