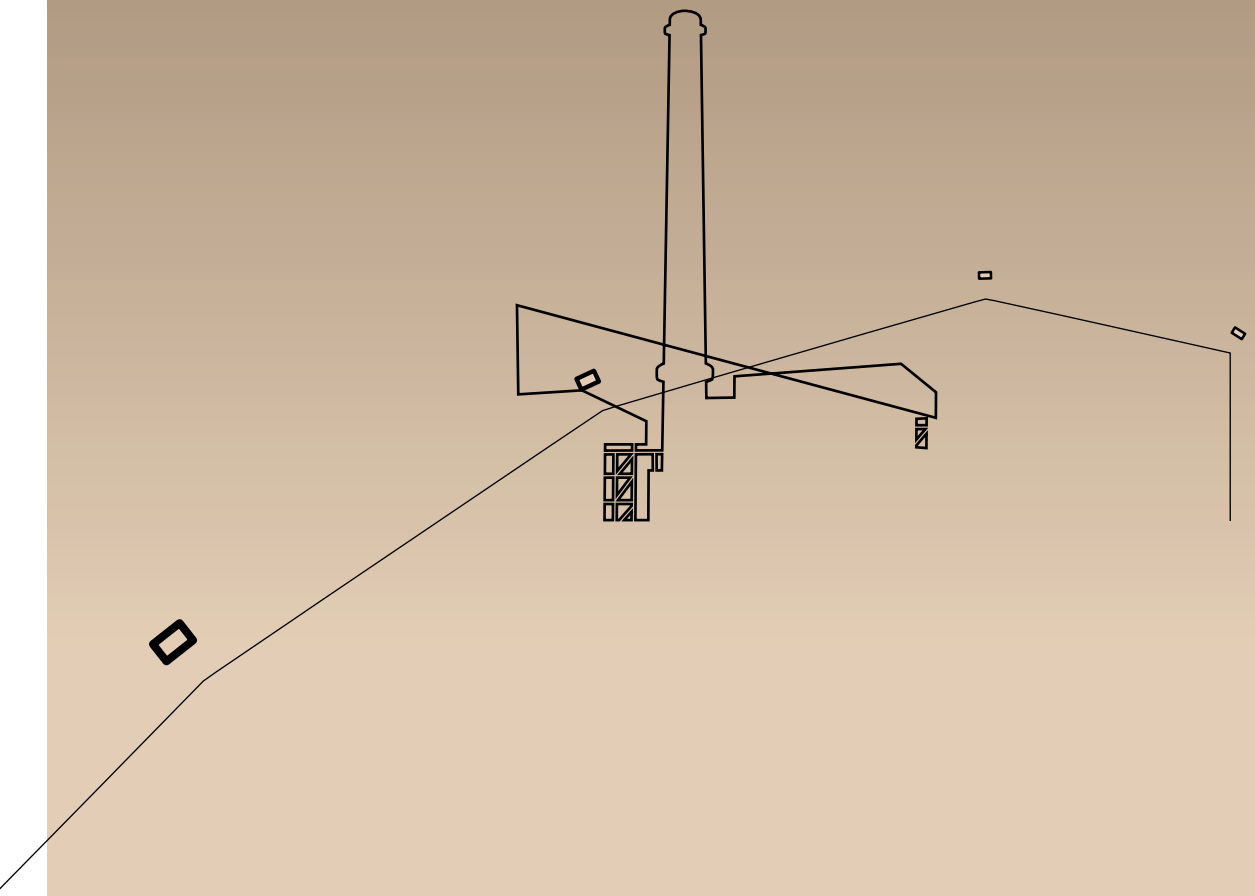

Risky Fishing

Power Plant Mercury Pollution and Illinois Sport Fish

Illinois PIRG Education Fund

April 2006

Risky Fishing: Power Plant Mercury Pollution an

Table of Contents

controls for a decade, may not achieve their meager reduction targets for another quarter century, and won't remedy local hot spots of mercury pollution.

In response to the insufficient federal rule, many states are pursuing more stringent mercury reductions of their own. Three states already have laws in effect that will reduce their mercury emissions by 90%, an achievable and affordable standard using modern emissions control technology. At the direction of Governor Rod Blagojevich, Illinois EPA on March 14th, 2006 finalized a proposed administrative rule to adopt a similar standard in Illinois. To protect public health by reducing mercury deposition that accumulates to toxic concentrations in fish, Illinois should adopt the proposed Illinois mercury rule.

Why is Mercury Dangerous?

Exposure to all forms of mercury is harmful to the health of humans and animals. Mercury is well known to be toxic to humans in incidents of acute hig

mercury-containing coal.[12] Other studies have indicated that since the beginning of the industrial era, human activities have typically increased bioavailable mercury concentrations by a factor of three to ten.[13]

Power plants remain the largest source of manmade mercury emissions both in Illinois and in the nation as a whole. Although mercury emissions from power plants are not currently systematically monitored, emissions have been estimated using several different methodologies.

Based on information from U.S. EPA's 2002 National Emissions Inventory, which collects data from a variety of sources on emi

Rank	Plant	Owner	County	2002 Mercury Emissions (Lbs)
15	Duck Creek	Central Illinois Light Company (Ameren)	Fulton	171
16	Hennepin	Illinois Power Company (Dynegy)	Putnam	168
17	Meredosia	Central Illinois Public Service Company (Ameren)	Morgan	119
18	Marion	Southern Illinois Power Cooperative		

local emissions sources are responsible for over 60% of mercury deposition at in-state hot spots.[24]

It has been estimated that 80 percent of the mercury loading into Lake Michigan is the result of atmospheric deposition.[25] Recent data fro

How Much Mercury is Safe?

U.S. EPA has established a reference dose, or "safe" daily dose of mercury, of 0.1 micrograms of methylmercury per kilogram of body weight per day.[33] The reference dose represents the amount of methylmercury which, when ingested daily over a lifetime, is anticipated to be without adverse health effects to people, including sensitive populations, based on current scientific knowledge. In 2000, the National

The “safe” limit varies for women of different weight. Heavier than average women, for example, can consume fish with slightly higher levels of methylmercury without exceeding

Sources of Fish Mercury Concentration Data

This report analyzes fish tissue mercury concentration data from the following two studies of fish contaminant levels.

Illinois Fish Contaminant Monitoring Program, 1985-2004 (IFCMP)

This ongoing Illinois state program screens fish samples from approximately 40 bodies of water per year for contamination from a dozen pesticides and industrial pollutants, including mercury. The fish are collected by the Illinois Department of Natural Resources (IDNR) and tested by IEPA. Since one of the primary purposes of the program is to provide the data used by the Illinois Depar

single serving of fish containing very high levels of mercury (2.0 ppm or higher) could expose her baby to dangerous levels of mercury.[45]

- Most of the fish composites were collected during the summer and fall of the sampling year.
- Within each study, researchers use consistent methods to collect and analyze samples.

Findings: Mercury in Sport Fish from Illinois Lakes and Streams

An analysis of the 827 Illinois fish ss

concentrations in these counties ranged from 0.20 ppm in Will County to 0.50 ppm in Pope County.

- In 8 of the 75 counties (Boone, DeKalb, Edwards, Effingham Kane, Pope, Pulaski, and Schuyler)

County	Number of Composite Samples	Total Number of Fish Tested	Average Mercury Concentration of Composite Samples (ppm)	Maximum Mercury Concentration Among Composite Samples (ppm)	Percent of Composite Samples Exceeding Safe Limit for Women (>0.13 ppm)
Knox	13	58	0.19	0.49	46%
Lake	46	177	0.14	0.54	41%
LaSalle	19	77	0.11	0.17	21%
Lee	1				

were, in descending order of average mercury concentration, bigmouth buffalo, freshwater drum, striped bass, lake trout, spotted bass, sauger, smallmouth buffalo, spotted sucker, flathead catfish, largemouth bass, brown trout, Chinook salmon, white bass, channel catfish, carp, and white sucker.

- As expected, predator fish at the top of the aquatic food chain tended to have p3[illegible]90 0 0.2399999968.94006 cm BT 50 0 0 50 0 0Tm /F2.0 1 Tf ( ) Tj ET Q Q q 9 40.620056 59

FISH HAVING MERCURY CONCENTRATIONS ABOVE U.S. EPA SAFE LIMIT FOR WOMEN

Bigmouth Buffalo

Brown Trout

Carp

Channel Catfish

Chinook Salmon

Flathead Catfish

Freshwater Drum

Lake Trout

Largemouth Bass

Sauger

Smallmouth Buffalo

Spotted Bass

Spotted Sucker

Striped Bass

White Bass

White Sucker

Averages are of composite samples, usually of five individual fish. The U.S. EPA safe limit for women is 0.13 ppm and is calculated based U.S. EPA's reference dose assuming women of average weight (143 pounds) who eat two average meals (6 oz. cooked) of fish per week.

Fish Mercury Contamination in Illinois Water Bodies

- In 66 of the 145 lakes and streams included in the studies, the average fish sample mercury concentrations exceeded U.S. EPA's safe limit for women (Table G).
- The ten with highest average fish sample mercury concentrations were, in descending order: Lusk Creek in Pope County, Monee Reservoir in Will County, Devil's Kitchen Lake in Williamson County, a

Rank	Water Body	County	Number of Composite Samples	Total Number of Fish Tested	Ave

Rank	Water Body	County	Number of Composite Samples	Total Number of Fish Tested	Average Mercury Concentration of Composite Samples (ppm)	Maximum Mercury Concentration Among Composite Samples	Percent of Composite Samples Exceeding Safe Limit for Women (>0.13 ppm)	Percent of Comp

Rank	Water Body	County	Number of Composite Samples	Total Number of Fish Tested	Average Mercury Concentration of Composite Samples (ppm)	Maximum Mercury Concentration Among Composite Samples	Percent of Composite Samples Limit for Women (>0.13 ppm)	Percent of Composite Samples Exceeding IEPA Special Advisory Threshold (!0.23 ppm)	IEPA Special Advisory Issued?[a]
53	Otter Lake	Macoupin	5	25	0.16	0.51	20%	20%	

Regula

An Illinois Solution: The State's Proposed Mercury Rule

On January 5, 2006, Governor Rod R. Blagojevich instructed IEPA to draft an administrative rule to reduce mercury emissions by 90 percent in Illinois. The Illinois mercury rule would take Illinois in a direction ver

coal burned in Illinois. And ACI is just one of several promising mercury control technologies.[68]

As is the case in any industry, mercury control technology improves with time. Increasing demand for mercury controls through mandated emissions reductions will further increase the rate of technological innovation, which in turn will bring down prices and increase mercury capture rates. In 2000, the U.S. Environmental Protection Agency said, "EPA has found that there are cost-effective ways of controlling mercury emissions from power plants. Technologies available today and technologies expected to be available in the near future can eliminate most of the mercury from utilities at a cost far lower than one percent of utility industry revenues."[69]

In October 2004, the National Wildlife Federation (NWF) conducted a study to estimate the cost of reducing mercury emissions by 90% in five coal-dependent states

Widespread Support for Stringent Mercury Emissions Standards

The following is a list of Illinois officials, health, environmental, and public interest groups, businesses, and other organizations that have signed letters in support of the Illinois mercury rule or otherwise called for a 90% reduction in coal-fired power plant mercury emissions.[75]

Access Living
Action for Children
Advocate Health Care
African American Healthcare Council
Alexian Pediatric Center of Excellence
Alliance for the Great Lakes (formerly the Lake Michigan Federation)
American Academy of Pediatrics, Illinois Chapter
American Bottom Conservancy
American Friends Service Committee
American Lung Association of Metropolitan Chicago
Asian Health Coalition of Illinois
Asian Human Services
Autism International Association
Business and Professional People for the Public Interest
Center for African American Health
Center for Neighborhood Technology
Chicago Clean Power Coalition
Chicago Recycling Coalition
Citizens Against Ruining the Environment
Clean Air Task Force
Critical Action Illinois
Environmental Law and Policy Center
Gilead Outreach and Referral Center
Good Neighbor Committee of South Cook County
Health and Medicine Policy Research Group
Hospitals for a Healthy Environment
Human Action Committee Organization

Appendix A: Text of The 2006 Illinois Fish Consumption Advisory for Methylmercury[78]

In

		Advice for
Water	**Fish Species**	**women beyond childbearing age, m**

Appendix C: Data—Illinois Fish Contam

County	Stream or lake name	Species	Sampling Date	Number of Individuals	Fillet Mercury Concentration (ppm)	Mercury Detect. Level
Alexander	Mississippi River–South	White bass	08/24/90	5	0.31	
Bond	Greenville New Lake	Largemouth bass	09/20/99	5	0.10	X
Bond	Patriot's Park Lake (Greenville Old)	Largemouth bass	10/03/01	5	0.44	
Bond	Patriot's Park Lake (Greenville Old)	Largemouth bass	10/03/01	5	0.27	
Boone	Piscasaw Creek	Smallmouth bass	07/24/03	3	0.46	
Brown	Illinois River	Largemouth bass	07/26/89	5	0.03	
Brown	Illinois River	Largemouth bass	08/06/99	5	0.10	X
Brown	Illinois River	White bass	08/06/99	4	0.10	X
Calhoun	Mississippi River–Central	Largemouth bass	08/18/88	4	0.13	
Calhoun	Mississippi River–Central	Largemouth bass	09/10/90	5	0.08	
Calhoun	Mississippi River–South Central	Silver Carp	399968e Wh			

County	Stream or lake name	Species	Sampling Date	Number of Individuals	Fillet Mercury Concentration (ppm)	Mercury Detect. Level
Cook	Busse Reservoir	Largemr				

County	Stream or lake name	Species	Sampling Date	Number of Individuals	Fillet Mercury Concentration (ppm)	Mercury Detect. Level
Cook	Chicago River–North Branch	Carp	08/29/00	4	0.10	X
Cook	Chicago River–North Branch	Green sunfish	08/13/99	6	0.10	X
Cook	Chicago River–North Branch	Green sunfish	08/13/99	6	0.10	X
Cook	Chicago River–North Branch	Largemouth bass	08/13/99	6	0.14	
Cook	Chicago River–North Branch	Largemouth bass	08/13/99	6	0.10	X
Cook	Chicago River–North Branch	Largemouth bass	09/01/00	5	0.10	X
Cook	Chicago River–North Branch	Largemouth bass	07/31/01	6	0.10	X
Cook	Chicago River–North Branch	Sunfish (green)	09/01/00	5	0.10	X
Cook	Chicago River–North Branch	Sunfish (green)	09/01/00	5	0.10	X
Cook	Chicago Sanitary & Ship Canal	Carp	05/14/99	5	0.10	X
Cook	Chicago Sanitary & Ship Canal	Carp	05/14/99	5	0.10	X
Cook	Chicago Sanitary & Ship Canal	Carp	08/01/00	5	0.10	X
Cook	Chicago Sanitary & Ship Canal	Carp	08/04/00	5	0.10	X

County	Stream or lake name	Species	Sampling Date	Number of Individuals	Fillet Mercury Concentration (ppm)

County	[redacted] or lake name	Species	Sampling Date	Number of Individuals	Fillet Mercury Concentration (ppm)	Mercury Detect. Level
DeWitt	[redacted]					

County	Stream or lake name	Species	Sampling Date	Number of Individuals	Fillet Mercury Concentration (ppm)	Mercury Detect. Level
Jackson	Big Muddy River	Channel catfish	08/16/88	5	0.09	
Jackson	Big Muddy River	Channel catfish	08/18/88	5	0.10	
Jackson	Big Muddy River	Channel catfish	09/26/90	5	0.01	X
Jackson	Big Muddy River	Channel catfish	08/22/02	3	0.12	
Jackson	Big Muddy River	White crappie	09/26/90	5	0.15	
Jackson	Campus Lake	Largemouth bass	07/09/97	5	0.08	
Jackson	Campus Lake	Largemouth bass	07/15/99	5	0.18	
Jackson	Campus Lake	Largemouth bass	06/20/00	5	0.30	
Jackson	Campus Lake	Largemouth bass	05/21/01	5	0.21	
Jackson	Carbondale Lake	Largemouth bass	06/02/04	4	0.29	
Jackson	Carbondale Lake	Largemouth bass	06/02/04	4	0.15	
Jackson	Carbondale Lake	White crappie	06/02/04	5	0.09	
Jackson	Cedar Lake	Largemouth bass	05/17/85	5	0.52	
Jackson	Cedar Lake	Largemouth bass	05/23/86	5	0.95	
Jackson	Cedar Lake	Largemouth bass	05/20/87	5	0.62	
Jackson	Cedar Lake	Largemouth bass	05/24/88	5	0.17	
Jackson	Cedar Lake	Largemouth bass	05/10/89	5	0.61	
Jackson	Cedar Lake	Largemouth bass	05/22/90	5	0.47	
Jackson	Cedar Lake	Largemouth bass	05/14/91	5	0.73	
Jackson	Cedar Lake	Largemouth bass	06/01/92	5	0.50	
Jackson	Cedar Lake	Largemouth bass	07/01/97	5	0.33	
Jackson	Cedar Lake	Largemouth bass	07/01/97	5	0.20	
			07/31/98	5	0.75	
			07/31/98	5	0.34	
			05/12/99	5	0.38	
			05/14/04	3	0.45	
			05/14/04	5	0.21	

County	Stream or lake name	Species	Sampling Date	Number of Individuals	Fillet Mercury Concentration (ppm)	Mercury Detect. Level
Jefferson	Rend Lake	Largemouth bass	10/01/86	5	0.13	
Jefferson	Rend Lake	Largemouth bass	09/30/87	5	0.07	
Jefferson	Rend Lake	Largemouth bass	10/04/88	5	0.01	X
Jersey	Illinois River	Largemouth bass	08/29/85	5	0.13	
Jersey	Illinois River	Largemouth bass	07/28/87	5	0.09	
Jersey	Illinois River	Largemouth bass	07/11/89	5	0.19	
Jersey	Illinois River	Largemouth bass	08 0 37 0 0			

County	Stream or lake name	Spe

County	Stream or lake name	Species	Sampling Date	Number of Individuals	Fillet Mercury Concentration (ppm)	Mercury Detect. Level
Pope	Ohio River	Largemouth bass	07/11/91	5	0.28	
Pope	Ohio River	Largemouth bass	07/31/97	5	0.46	
Pope	Ohio River	Largemouth bass	07/31/97	5	0.39	
Pulaski	Ohio River	Largemouth bass	07/25/97	3	0.27	

County	Stream or lake name	Species	Sampling Date	Number of Individuals	Fillet Mercury Concentration (ppm)	Mercury Detect. Level
St. Clair	Kaskaskia River	White bass	08/31/04	4	0.05	
Tazewell	Mackinaw River	White bass	08/25/00	5	0.10	X
Tazewell	Mackinaw River	White bass	08/07/01	5	0.10	X
Tazewell	North Spring Lake	Black crappie	03/18/03	5	0.10	X
Tazewell	North Spring Lake	Largemouth bass	03/18/03	5	0.14	
Tazewell	North Spring Lake	Largemouth bass	03/18/03	5	0.13	
Tazewell	Powerton Lake	Smallmouth bass	05/17/99	5	0.10	X
Tazewell	Powerton Lake	Smallmouth bass	05/17/99	5	0.10	X
Tazewell	Powerton Lake	Smallmouth bass	04/14/00	3	0.10	X
Tazewell	Powerton Lake	Smallmouth bass	04/14/00	5	0.10	X
Tazewell	Powerton Lake	Smallmouth buffalo	05/19/98	5	0.01	
Tazewell	Powerton Lake	Smallmouth buffalo	05/19/98	5	0.01	
Tazewell	Powerton Lake	Smallmouth buffalo	05/19/98	5	0.01	
Tazewell	Powerton Lake	White bass	05/19/98	5	0.01	
Tazewell	Powerton Lake	White bass	04/14/00	5	0.10	X
Tazewell	Powerton Lake	White bass	04/14/00	5	0.10	X
Tazewell	South Spring Lake	Black crappie	03/10/03	5	0.10	X
Tazewell	South Spring Lake	Largemouth bass	03/10/03	5	0.41	
Tazewell	South Spring Lake	Largemouth bass	03/10/03	5	0.10	

V999 0 0 0.2399

County	Stream or lake name	Species

County	Stream or lake name	Species	Sampling Date	Number of Individuals	Fillet Mercur

Appendix D: Raw Data—U.S. EPA Lake Fish Tissue Study composite samples (1999-2003)

County	Stream or Lake Name	Species	Preditor vs. Bottom-Dweller[a]	Sampling Year	Number of Indiv0 0 3780 0 Tr

End Notes

[1] National Academy of Science, National Research Council, *Toxicological Effects of Methylmercury* (Washington, DC: National Academy Press, 2000) (hereinafter *Toxicological Effects of Methylmercury*); U.S Environmental Protection Agency (EPA), *Mercury Study Report to Congress*, vol. 1 (December 1997) 0-2, available at http://www.epa.gov/mercury/report.htm (hereinafter *Mercury Study Report to Congress*).
[2] *Mercury Study Report to Congress*, vol. 1: 2-5 & 3-22.
[3] *Mercury Study Report to Congress*, vol. 1: 3-23.
[4] *Toxicological Effects of Methylmercury*; *Mercury Study Report to Congress*.
[5] *Mercury Study Report to Congress*, vol. 1: 3-22.
[6] Kathryn R. Mahaffey, Robert P. Clickner, and Catherine C. Bodurow, "Blood Organic Mercury and Dietary Mercury Intake: National Health and Nutrition Examination Survey, 1999 and 2000," *En0 Tm /F2.0 1 Tf (,) T j 4761172 0 Tm (9) T*

available at http://www.arl.noaa.gov/data/web/reports/cohen/18_Great_Lakes_1999_updates_abbrev.pdf (herein after "Graphics for IJC Air Quality Advisory Board").

[27] *Mercury Study Report to Congress*, p. 2-5.

[28] U.S. EPA,

An Analysis of EPA's Cap-and-Trade Regulations" (15 April 2005) CRS-6, available at http://www.4cleanair.org/FinalMercuryModelRule-111405.pdf (hereinafter "An Analysis of EPA's Cap-and-Trade Regulations").

[55] "An Analysis of EP's Cap-and-Trade Regulations," CRS-6.

[56] EPA, Office of Inspector General, *Evaluation Report: Additional Analyses of Mercury Emissions Needed Before EPA Finalizes Rules for Coal-Fired Electric Utilities*, Report No. 2005-P-00003, (3 February 2005).

[57] U.S. PIRG Education Fund, "Made in the USA: Power Plant and Mercury Pollution Across the Country" (September 2005) 9, available at http://illinoispirg.org/reports/madeintheusa.pdf (hereinafter "Made in the USA").

[58] Federal Register, vol. 70 (18 May 2005) 28632.

[59] STAPPA & ALAPCO, "State Programs to Control Mercury Emissions from Utilities," (November 28, 2005), available at http://www.4cleanair.org/StatePrograms.pdf (Hereinafter "State Programs to Control Mercury Emissions").

[60] "State Programs to Control Mercury Emissions.

[61] National Caucus of Environmentah499999 0 09999 0 09999 0 09999 0 Tm (c) Tj 41 0 0 41 83006 cm BT 41 0 0 41 00 Tm1 0 0 41 1