

**TECHNICAL REPORT DATA**

*(Please read Instructions on the reverse before completing)*

1. REPORT NO. EPA-600/3-78-103		2.		3. REPORT'S ACCESSION NO. <b>PB290659</b>	
4. TITLE AND SUBTITLE Metal Bioaccumulation in Fishes and Aquatic Invertebrates: A Literature Review				5. REPORT DATE December 1978 Issuing date	
7. AUTHOR(S) Glenn R. Phillips and Rosemarie C. Russo				6. PERFORMING ORGANIZATION CODE	
9. PERFORMING ORGANIZATION NAME AND ADDRESS Fisheries Bioassay Laboratory Montana State University Bozeman, Montana 59717				8. PERFORMING ORGANIZATION REPORT NO.	
12. SPONSORING AGENCY NAME AND ADDRESS Environmental Research Laboratory--Duluth, MN Office of Research and Development U.S. Environmental Protection Agency Duluth, Minnesota 55804				10. PROGRAM ELEMENT NO.	
				11. CONTRACT/GRANT NO. R803950	
15. SUPPLEMENTARY NOTES				13. TYPE OF REPORT AND PERIOD COVERED Final	
				14. SPONSORING AGENCY CODE EPA/600/03	
16. ABSTRACT <p>Literature concerning the bioaccumulation of metals by freshwater and marine fishes and invertebrates has been reviewed; metal residue levels are also reported for a few mammals and plants. Twenty-one metals are considered in individual sections of the review and a bibliography of over 300 literature citations is included.</p> <p>The major sources of each metal to the environment are listed as are the causes and symptoms of metal toxicity in humans. Some discussion is included on the health implications of human consumption of metal-contaminated aquatic organisms. Available information is presented on: routes of accumulation, kinetics of accumulation and excretion, distribution within organisms, physiological responses of organisms, residue-toxicity thresholds, chemical speciation relative to biological availability, and microbial and chemical interconversions in aqueous systems. Major areas of insufficient knowledge are identified.</p> <p>Few metals accumulate in the edible portions of aquatic organisms; moreover, most metals when ingested orally have a relatively low toxicity to humans. However, mercury, arsenic, and radioactive cesium may reach hazardous concentrations in edible tissues of fishes and shellfishes; additionally, in shellfishes, cadmium, lead, and other metal isotopes may exceed levels safe for human consumption.</p>					
17. KEY WORDS AND DOCUMENT ANALYSIS					
a. DESCRIPTORS		b. IDENTIFIERS/OPEN ENDED TERMS		c. COSATI Field/Group	
Pollution Residues Metals		Aquatic organisms Energy development Metal bibliography Bioaccumulation Bioconcentration Heavy metals		06/F,T	
18. DISTRIBUTION STATEMENT  RELEASE TO PUBLIC		19. SECURITY CLASS (This Report) UNCLASSIFIED		20. SECURITY CLASS (This page) UNCLASSIFIED	
				22. PRICE AD6 - AD1	