SILVER ANNIVERSARY
International Conference on
Heavy Metals in the Environment
August 6-10, 2000, Ann Arbor, MI

Co-Sponsored by
University of Michigan, Ann Arbor
University of Michigan, Dearborn
U.S. Geological Survey
Environment Canada
Elsevier Science Publishers, Oxford, U.K.

Session 1: Opening Plenary

9:00 Official Opening
Prof. Robert Gray (Senior Associate Dean, School of Public Health)
Prof. Fawwaz Ulaby (Vice President for Research, University of Michigan)
Honorable Mayor Sheldon (City of Ann Arbor)

9:30 Prof. Thomas Hutchinson (Trent University): Evolution of Metal Tolerances in Plants

10:45 Prof. Herbert Needleman (University of Pittsburgh): Two Millennia of Lead Exposure

11:30 Steve Lindberg (Oak Ridge National Lab): The Barrow Arctic Mercury Study (BAMS): Recent Measurements of the Production of Reactive Gaseous Mercury during Mercury Depletion Events at Point Barrow, Alaska **[Contribution Number: 1000]**

Session 2: Atmospheric Mercury Behavior

Chairpersons: Ralf Ebinghaus (GKSS Research Centre, Germany) and Gerry Keeler (University of Michigan)
Location: Hussey Room, Michigan League

14:30
Temporal and Spatial Variability of Total Gaseous Mercury in Canada: Preliminary Results from the Canadian Atmospheric Mercury Measurement Network (CAMNET)**[Contribution Number: 1001]**
Markus Kellerhals, Stephen Beauchamp, Wayne Belzer, Pierrette Blanchard, Frank Froude, Bruno Harvey, Karen McDonald, Martin Pilote, Laurier Poissant (Environment Candada), Keith Puckett, Bill Schroeder, Alexandra Steffen (Meteorological Service of Canada), Rob Tordon (Environment Canada)

14:50
Investigating the Influence of Long Range Transport on Mercury Deposition in South Florida **[Contribution Number: 1002]**
Matthew Landis (US EPA National Exposure Research Laboratory), Robert Stevens (Florida Department of Environmental Protection at USEPA), Winston Luke (National Oceanic and Atmospheric Administration), Gerald Keeler (Department of Environmental and Industrial Health, University of Michigan)

15:10
Trace Metal Transport to the Everglades: Apportioning Global, Regional and Local Source Contributions in

Aerosols**[Contribution Number: 1003]**
Joseph R. Graney (Department of Geological Sciences, Binghamton University), J. Timothy Dvonch, Gerald Keeler (University of Michigan Air Quality Laboratory) Robert Stevens and Matthew Landis (US Environmental Protection Agency)

15:30
Near Real Time Observations of the Removal of Ambient Reactive Gaseous Mercury by Precipitation**[Contribution Number: 1004]**
J. Timothy Dvonch, Gerald J. Keeler, James A. Barres, Frank J. Marsik, Mary Lynam, Elizabeth Malcolm (University of Michigan Air Quality Laboratory), Matthew S. Landis (USEPA-National Exposure Research Laboratory), Robert K. Stevens (Florida Dept. of Environmental Protection at USEPA)

16:30
Mercury, Sunshine and Sea-Salt Aerosol: Is it a Recipe for Cycling in the Marine Boundary Layer?
[Contribution Number: 1005]
I. M. Hedgecock, L. Forlano, N. Pirrone (CNR-Institute for Atmospheric Pollution, Italy)

16:50
Emission of Mercury to the Atmosphere from Selected Natural Soils in Nevada and California**[Contribution Number: 1006]**
M.S. Gustin (Department of Environmental and Resource Sciences, University of Nevada), M. F. Coolbaugh, M.A. Engle (Department of Geological Sciences, University of Nevada)

17:10
Real-World Emissions of Mercury from Automobiles: The 1998 Fort McHenry Traffic Tunnel Study**[Contribution Number: 1007]**
Gerald J. Keeler, J. Timothy Dvonch, James A. Barres (University of Michigan Air Quality Laboratory), Matthew S. Landis (USEPA-National Exposure Research Laboratory), Robert K. Stevens (Florida Dept. of Environmental Protection at USEPA)

17:30
Atmospheric Mercury Deposition Fluxes in Europe: Contributions from European Anthropogenic Emissions and Global Background Concentrations**[Contribution Number: 1008]**
Gerhard Petersen (GKSS Research Center, Institute of Hydrophysics, Germany)

17:50
Uncertainties in Mass Balance of US Atmospheric Mercury Emissions**[Contribution Number: 1009]**
Leonard Levin, Mary Ann Allan, Paul Chu (Electric Power Research Institute, California)

18:10
Mercury Research in Europe: Towards the Preparation of the New EU Air Quality Directive**[Contribution Number: 1010]**
Nicola Pirrone (CNR-Institute for Atmospheric Pollution, Italy)

Session 3: Uptake and Effects of Heavy Metals

Chairpersons: Tom Hutchinson (Trent University) and Paul Mushak (PB Associates, Durham, N.C.)
Location: Michigan Room, Michigan League

14:30
Uptake of Silver by a Unicellular Alga: Exceptions to the Free-Ion Model (FIM)**[Contribution Number: 1011]**
Claude Fortin, Peter Campbell (University of Québec)

14:50
Nickel Tolerance of Phytoplankton Isolated from a Recovering Lake near Sudbury Canada**[Contribution**

Number: 1012]
D.G. Woodfine (Canadian Environmental Modeling Centre, Trent University), M. Havas (Environmental Studies Department, Trent University, Canada) and J. Acreman (University of Toronto Culture Collection)

15:10
Food as a Cadmium Source for Aquatic Insects**[Contribution Number: 1013]**
Marie-Noëlle Croteau, Landis Hare and André Tessier (INRS-Eau, Université du Québec)

15:30
Structural and Functional Rearrangements in Polytene Chromosomes of Chironomids (Diptera) as Biomarkers for Heavy Metal Pollution in Aquatic Ecosystem**[Contribution Number: 1014]**
Paraskeva Michailova (1), Ninel Petrova (2), Stefano Bovero (3), Gabriella Sella (3), Lillian Ramella (3)
1. Institute of Zoology, Bulgarian Academy of Sciences
2. Institute of Zoology, Russian Academy of Sciences
3. Department of Animal Biology, University of Turin, Italy

16:30
Mussel (Mytilus Californianus and M. Galloprovincials/Trossulus Hybrids) Immune Systems as Biomarkers of Contaminant Exposure in San Francisco Bay, CA**[Contribution Number: 1015]**
Allison Luengen (Environmental Toxicology, University of California at Santa Cruz), Carolyn S. Friedman (Bodega Marine Laboratory, CA) and A.R. Flegal (Environmental Toxicology, University of California at Santa Cruz)

16:50
Heavy Metals Concentration and Burden in the Bivalves: Anadara (Senilia) Senilis, Crassostrea Tulipa and Perna Perna from Lagoons in Ghana**[Contribution Number: 1016]**
Fred A. Otchere, Claude R. Joiris, Ludo Holsbeek (Laboratory for Ecotoxicology, Free University of Brussels (VUB), Belgium), Ishaque B. Ali (Environmental Science Program, School of Science & Tech., Jackson State University, Mississippi)

17:10
Effect of the Sandbar Opening on Biomass and Metallic Composition in Typhia Domingensis Pers in the Iquipari Lagoon, São João Da Barra, RJ, Brazil**[Contribution Number: 1017]**
Carlos E. Rezende, Jorge Assumpção and Marcelo T. Nascimento (Universidade Estadual do Norte Fluminense, Centro de Biosciencias and Biotecnologia, Laboratório de Ciências Ambientais, Brazil)

17:30
Earthworms as Bioindicators of Mercury Pollution**[Contribution Number: 1018]**
Jennifer Hinton and Marcello Veiga (Dept. of Mining and Mineral Process Engineering, University of British Columbia)

17:50
Lead in the Nigerian Environment: Problems and Prospects**[Contribution Number: 1019]**
M.K.C. Sridhar, J.F. Olawuyi, L.A. Adogame, I.R. Okekearu, C.O. Osajie and Linda Aborkar (Division of Environmental Health, College of Medicine, University of Ibadan, Nigeria)

Session 4: Arsenic in the Environment

Chairpersons: Bruce Fowler (University of Maryland) and Arun Mukherjee (University of Helsinki, Finland)
Location: Vandenberg Room, Michigan League

14:30
Influence of Organic Acids and Natural Chelating Agents on Copper, Chromium, and Arsenic Leaching from Treated Wood**[Contribution Number: 1020]**
L. Blue, R. Sheets, R. Biagioni (Chemistry Department, Southwest Missouri State University)

14:50
Uptake of arsenic by selected plants and deer at a former military base contaminated with organoarsenic-based warfare agents**[Contribution Number: 1021]**
F. Pitten, G. Müller, A. Kramer, H. Below (Institute of Hygiene and Environmental Medicine, University of Greifswald, Germany), P. König (Botanical Garden, University of Greifswald, Germany), K. Thuriw (Institute for Measuring and Sensor Systems Rostock, Germany)

15:10
Evidence of Iron in Arsenic Mobilization Groundwater of Bengal Delta Plain**[Contribution Number: 1022]**
S.J. Sahu. S. Roy, J. Jana, R. Bhattacharya, D. Chatterjee (Department of Chemistry, University of Kalyani, India) and S.S. Dey Dalal (River Research Institute, India)

15:30
Health Surveillance in a Community Affected by Arsenic-Contaminated Water**[Contribution Number: 1023]**
Lynda Knobeloch, Charles Warzecha, Marc Weisskopf and Henry Anderson (Wisconsin Department of Health and Family Services)

16:30
Causes and Effects of Arsenic Contamination in Drinking Water in Bangladesh: A Critical Review**[Contribution Number: 1024]**
Arun B. Mukherjee (Department of Limnology and Environmental Protection, University of Helsinki, Finland)

16:50
Arsenite Disrupts Mitosis and Induces Apoptosis in Phenotypically p53 Negative Human Skin Fibroblasts**[Contribution Number: 1025]**
J. Christopher States (Department of Pharmacology and Toxicology, University of Louisville School of Medicine, KY), Michael J. McCabe Jr., Joel G. Pounds, John J. Reiners Jr., David J. Kaplan, Patricia Mathieu and Hans G. Sowder (Institute of Chemical Toxicology, Wayne State University, MI)

17:10
Effects of Arsenic(V) and Arsenic(III) on Human Keratinocytes Grown in Submerged and Lifted(Artificial Skin) Cultures**[Contribution Number: 1026]**
L. Bernstam, J. Lee and J. Nriagu (Department of Environmental Health Sciences, School of Public Health, University of Michigan)

17:30
As and Cd Alteration of HSP60Expression in Relation to Renal Cell Toxicity**[Contribution Number: 1027]**
Bruce A. Fowler (Program in Toxicology, University of Maryland, MD)

Session 5: Bogs – Archives of Metal Pollution

Chairpersons: Bill Shotyk (University of Berne) and Eilev Steinnes (Norwegian University of Science and Technology, Trondheim)
Location: Henderson Room, Michigan League

14:30
Geochemical Evidence for Atmospheric Pollution from Prehistoric Metal Mining in Blanket Peat: A Case Study from Copa Hill, Cwmystwyth, Mid-Wales, UK**[Contribution Number: 1028]**
T. Mighall (Centre for Quaternary Science, Coventry University, UK), J. P. Grattan (Institute of Earth Studies, University of Wales, UK), S. Forsyth and S. Timberlake (Early Mines Research Group, UK)

14:50
Elevated Mercury Concentrations in Southern Patagonian Peat Bogs – An Anthropogenic Signal?

[Contribution Number: 1029]
Harald Biester, Markus Arnold (Institute of Environmental Geochemistry, University of Heidelberg, Germany), Mateja Gosar (Geological Survey of Slovenia)

15:10
The Investigation and Dating of Transboundary Air Pollution Found in Southern Greenland**[Contribution Number: 1030]**
M. Goodsite (Department of Atmospheric Environment, Danish National Environmnetal Research Institute, Denmark), C. Lohse, T. Hansen (Department of Chemistry, University of Southern Denmark), W. Shotyk (Geological Institute, University of Berne, Switzerland), W. Knaap (Geobotanical Institute, University of Berne, Switzerland), J. Heinemeier (Institute of Physics and Astronomy, University of Aarhus, Denmark), A. Cheburkin (EMMA Analytical, Canada), R. Frei, N. Anderson (Geological Institute of Geography, University of Copenhagen, Denmark), P. Appleby (Environmental Radioactivity Research Center, University of Liverpool, UK), G. Asmund (Department of Arctic Environment, Danish National Environmental Research Institute, Denmark), N.Christensen (Department of Atmospheric Research, Danish National Environmental Research Institute, Denmark)

15:30
Discrimination between Regional and Point-Source Atmospheric Hg Pollution using Sediment Records from Drainage Lakes, Maine, USA**[Contribution Number: 1031]**
S.A. Norton, C.T. Hess, J.A. Cangelosi, M. Norris, E.R. Perry, J.S. Kahl (Department of Geology, University of Maine) and D.L. Courtemanch (Department of Environmental Protection, Maine)

16:30
The Use of Fallout Radionuclides as Tracers for Study Heavy Metal Records in Peat Bogs**[Contribution Number: 1032]**
P. Appleby (Department of Mathematical Sciences, University of Liverpool, UK), W.S. Shotyk (Geological Institute, University of Berne,Switzerland), A Grünig (Swiss Federal Institute of Forestry, Switzerland)

16:50
Peat Profiles as Chronometers of Atmospheric Pollution**[Contribution Number: 1033]**
E. Steinnes (Department of Chemistry, Norwegian University of Sciences and Technology)

17:10
Geochemically Fingerprinting Spatial and Temporal Recovery in a Highly Anthropogenically Disturbed Lake: Torch Lake, (Upper Peninsula) Michigan, USA**[Contribution Number: 1034]**
J. Fett, S.J. Simpson, D.T. Long, and L.C. Patino (Department of Geological Sciences, Michigan State University)

17:30
Mercury Atmospheric Deposition Recorded from Dated Peat Bog Cores in South America during the Present Century**[Contribution Number: 1035]**
L.D. Lacerda, M.G. Ribeiro & J. Abrão (Department of Geoquímica, Universidade Federal Fluminense, Brazil)

17:50
Contemporary and Historical Eolian Depositional Fluxes of Mercury: Archival Records in Ombrotrophic Bogs and Lake Sediments from Nova Scotia and New Zealand**[Contribution Number: 1036]**
C.H. Lamborg, W.F. Fitzgerald, P.H. Balcom (University of Connecticut, Department of Marine Sciences), A. Damman (Kansas State University, Division of Biology), J. Benoit (University of Maryland, Chesapeake Biological Laboratory)

Session 6: Ecosystem Remediation

Chairpersons: Ulrich Forstner (Technical University of Hamburg-Harburg) and Al Page (University of California, Davis)

Location: Michigan Room, Michigan League

9:30
Remediation of Heavy Metals and Radionuclides by Phytoimmobilization: Evaluation of Sequestering Agents**[Contribution Number: 1037]**
Anna Sophia Knox (formerly A. Chlopecka), Tom Hinton (Savannah River Ecology Laboratory, University of Georgia), Dan Kaplan, Steve Serkiz (Westinghouse Savannah River Company, South Carolina)

9:50
Arsenic Uptake from Contaminated Soils by a Hyperaccumulating Fern**[Contribution Number: 1038]**
Lena Ma, Cong Tu, Beth Kennelley and Ken Komar (Soil and Water Science Department, University of Florida)

10:10
Use of Heavy Metal Resistant Bacteria in a Bioreactor Concept (Bacteria Metal Sludge Reactor) to Remove Bioavailable Heavy Metals from Polluted Soils**[Contribution Number: 1039]**
D. van der Lelie, P. Corbisier, S. Taghavi, M. Mergeay, M. De Smet, L. Hooyberghs, L. Kinnaer, L. Diels (VITO, Environmental Technology, Belgium), N. Spelmans, J. Vangronsveld (LUC, Center for Environmental Sciences, Belgium), G. Brox (Tekno Associations, Salt Lake City, UT)

11:00
The Adsorption of Metals Lead and Zinc from Acid Waters by a Brazilian Peat**[Contribution Number: 1040]**
Maria Dionísia Costa dos Santos (Departmento de Metalurgia Extrativa, Centro de Tecnologia Mineral/Ministério da Ciência e Tecnologia, Brasil) Laurindo de Salles Leal Filho (Departmento de Engenharia de Minas, Escola Politécnica da Universidade de São Paulo, Brasil)

11:20
Bioabsorption of Heavy Metals by Macrofungi Ganoderma Iucidium**[Contribution Number: 1041]**
T. R. Muraleedharan (Indian Institute of Technology (IIT), Kanpur, India), Leela Iyengar (Department of Chemistry, IIT, India), Ligy Philip (Department of Civil Engineering, IIT, India) and C. Venkobachar (Department of Civil Engineering, University of West Indies, Trindidad)

11:40
Using Some Agricultural Plant Species for the Decontamination of Heavy Metals and Radionuclides in the Environment**[Contribution Number: 1042]**
Boris Sorochinsky, Dmitro Grodzinsky (Institute of Cell Biology and Genetic Engineering, Ukraine), Slavik Dushenkov (Biotech Center, Rutgers University, New Jersey)

12:00
Physico-Chemical and Biological Evaluation of the Effiicacy of in situ Metal Inactivation in Contaminated Soils**[Contribution Number: 1043]**
J. Vangronsveld*, N. Spelmans, H. Clijsters, E. Adriaensens, R. Carleer, L. Van Poucke (Limburgs Universitair Centrum, Universitaire Campus, Belgium); D. van der Lelie, M. Mergeay, P. Corbisier, J. Bierkens, L. Diels (VITO, Flemish Institute for Technological Research, Belgium)

Session 7: Mercury in Aquatic Ecosystems

Chairpersons: Steve Lindberg (Oak Ridge National Laboratory) and Drude Lacerda (Federal University of Fluminense, Brazil)
Location: Vandenberg Room, Michigan League

9:30
The Effect of Dry Down and Natural Fires on Mercury Methylation in the Florida Everglades**[Contribution Number: 1044]**

David P. Krabbenhoft (US Geological Survey, Wisconsin) and Larry E. Fink (South Florida Water Management District)

9:50
Mercury and Methylmercury in Long Island Sound: Sources, Cycling and Human Related Emissions**[Contribution Number: 1045]**
P. Balcom, W.F. Fitzgerald, C.H. Lamborg (Department of Marine Sciences, University of Connecticut), G.M. Vandal (Pfizer Pharmaceutical Inc.), K.R. Rolfhus (Water Chemistry Program, University of Wisconsin), C. Langer (Pfizer Pharmaceutical Inc.)

10:10
Dissolved Reactive Mercury Speciation in Water Profiles from Sepetiba Bay, SE Brazil**[Contribution Number: 1046]**
R.V. Marins, Luiz D. Lacerda, and Heloísa H.M. Paraquetti (Dept. Geoqúimica, Universidade Federal Fluminense, Brazil)

11:00
Tidal Remobilization of Mercury from Mud Flat Acidic Pore Waters**[Contribution Number: 1047]**
Rozane V. Marins, Luiz D. Lacerda (Dept. Geoquímica, Universidade Federal Fluminense, Brazil) and Stephane Mounier (RCMO, Universite de Toulon, France)

11:20
Factors Controlling the Bioaccumulation of Mercury and Methylmercury into Benthic Invertebrates and Fish**[Contribution Number: 1048]**
Robert P. Mason, Kelly McAloon, Joy Leaner, Jean-Michel Laporte and Sandrine Andres (Chesapeake Biological Laboratory, University of Maryland)

11:40
Mercury in the South Florida Everglades Ecosystem: An Assessment of Ecological Risk**[Contribution Number: 1049]**
Q.J. Stober, K.W. Thornton (FTN Associates, LTD, Arkansas), R. Jones (Florida International University), S.L. Rathbun (University of Georgia), and D. Scheidt (US Environmental Protection Agency Region 4, Georgia)

12:00
An Evaluation of Mercury Levels Released from a Coal-Fired Power Plant on Surface Soil Near the Plant**[Contribution Number: 1050]**
Margaret Farago, Sirima Panyametheekul, and John Rieuwerts (T.H. Huxley School of Environment, Imperial College of Science, UK)

Session 8: Bogs – Archives of Metal Pollution

Chairpersons: Antonio Martinez Cortizas (University of Santiago, Spain) and Ed Boyle (Massachusetts Institute of Technology)
Location: Henderson Room, Michigan League

9:30
Atmospheric Pb Deposition during the Last 4,600 Years Recorded by Two Ombrotrophic Peat Bogs in NW Spain**[Contribution Number: 1051]**
A. Cortizas et al. (Department of Edafología y Química Agrícola, Universidad de Santiago, Spain)

9:50
New Peat Bog Record of Atmospheric Lead Deposition Since the Roman Period at Etang de la Gruère, Jura Mountains, Switzerland: Total Pb Concentrations, Enrichment Factors, Isotopic Composition, and Organolead Species**[Contribution Number: 1052]**

W. Shotyk (1), D. Weiss (2), M. Heisterkamp (3), A.K. Cheburkin (4), and F.C. Adams (3)
1. Geological Institute, University of Berne, Switzerland
2. Earth, Atmospheric and Planetary Sciences, Massachusetts Institute of Technology
3. Dept. of Chemistry, University of Antwerp, Belgium
4. EMMA Analytical Inc., Ontario, Canada

10:10
Lead Isotopic Composition and Heavy Metal Concentrations as Tracers of Atmospheric Pollution Recorded in Peat and Lake Sediments (S. W. France)**[Contribution Number: 1053]**
S. Alfonso, F.E. Grousset, L. Massé, J. Jouanneau, J. Tastet (UMR 5805 EPOC, DGO, Université Bordeaux, France)

11:00
Stable Lead Isotopic Characterization of the Historical Record of Environmental Lead Contamination in Dated Freshwater Lake Sediment Cores from Central and Northern Scotland**[Contribution Number: 1054]**
J. Farmer, L.J. Eades (Department of Chemistry, University of Edinburgh, Scotland) A.B. MacKenzie (SURRC, Scotland), A.E. Bailey-Watts and A. Kirrika (NERC Institute for Ecology and Hydrology, Scotland)

11:20
The Power of Varved Lake Sediments for High-Resolution Studies of Lead Pollution History**[Contribution Number: 1055]**
M. Brännvall. R. Bindler, I. Remberg (Department of Ecology and Environmental Sciences, Umeå University, Sweden), Ove Emteryd (Department of Forest Ecology, Swedish University of Agricultural Sciences, Sweden)

11:40
Constraining Lead Sources to the North Atlantic Ocean: Recent Atmospheric Lead Deposition Recorded by Two Ombrotrophic Peat Bogs in Scotland and Eastern Canada**[Contribution Number: 1056]**
D. Weiss et al. (Earth, Atmospheric, and Planetary Sciences, Massachusetts Institute of Technology)

12:00
Reconstruction of Lead (Pb) Fluxes in Europe during 1955-1995 and Evaluation of Gasoline Lead Content Regulations**[Contribution Number: 1057]**
M. Costa-Cabral, C. Hagner, F. Feser and Hans von Storch (GKSS Research Center, Germany)

Session 9: Metals in the Urban Environment

Chairpersons: Ellen Silbergeld (University of Maryland) and Bert Allard (Linkoping University)
Location: Hussey Room, Michigan League

9:30
Lead reduction policies in Europe and the economic effects on German markets**[Contribution Number: 1058]**
Charlotte Hagner (Institute of Hydrophysics, GKSS-Research Center, Germany)

9:50
Effects of Water Pollution from Roads**[Contribution Number: 1059]**
Robert J. Hares, Neil I. Ward (ICP-MS Facility, Department of Chemistry, University of Surrey, UK)

10:10
Hg and other Heavy Metals in Water, Suspended Matter, and Biota in the Chattahoochee River**[Contribution Number: 1060]**
Klaus Neumann+, Berry Lyons (Department of Geology, University of Alabama,+ Current address: Byrd Polar Research Center, Ohio State University), Emma J. Rosi, Judy L. Meyer (Institute of Ecology, University of Georgia)

11:00
Post-Industrial Sources of Lead in Urban Air: A Case Study using Lead Isotopes in Yerevan, Armenia**[Contribution Number: 1061]**
Robert Kurkjian (Earth Sciences, University of California, Santa Cruz), Charles Dunlap (The Environmental Research and Management Center, American University of Armenia) and A. Russell Flegal (Environmental Toxicology, University of California, Santa Cruz)

11:20
Heavy Metal Pollution in Soil, Groundwater and Surface Water of Seven Selected Landfill Sites of Kuala Lumpur**[Contribution Number: 1062]**
M. Rahman (1), N. Hassan (2), P. Latif (3), M. Daud (4), M. Bardaie (5), (1. ESEIA Research Project, Faculty of Engineering, 2, 3. Faculty, Department of Environmnetal Science, 4,5. Faculty, Department of Biological and Agricultural Engineering, University of Putra Malaysia, Malaysia)

11:40
An Estimation of Trace Metal Emissions in Vilnius City**[Contribution Number: 1063]**
Darius Valiulis, Kestutis Kvietkus, Darius Ceburnis, and Jonas Sakalys (Atmospheric Pollution Research Laboratory, Institute of Physics, Lithuania)

12:00
The Evolution of Anthropogenic Lead in the Ocean, 1976-2000**[Contribution Number: 1064]**
Ed Boyle (Massachusetts Institute of Technology)

Session 10: Ecosystem Remediation

Chairpersons: Anna Knox (Savannah River Ecology Laboratory, University of Georgia) and John Farmer (University of Edinburgh)
Location: Michigan Room, Michigan League

15:10
The Use of Natural Zeolites in Active Barrier Systems for Subaqueous In-Situ Capping of Contami-nated Sediments**[Contribution Number: 1065]**
Patrick Jacobs (Department of Environmental Science and Technology, Technical University Hamburg-Harburg, Germany)

15:30
Electroremediation of Contaminated Soil from a Chlor-Alkali Factory**[Contribution Number: 1066]**
Pascal Suèr (Man-Technology-Environment Research Centre, Örebro University, Sweden)

16:30
Amelioration of Cd Contaminated Agricultural Soils Using Cation Exchangers**[Contribution Number: 1067]**
Neal Menzies, Katherine Snars, and Gillian Kopitke (School of Land and Food Sciences, University of Queensland, Australia)

16:50
Cadmium Availability in Remediated Soil: Availability Indices**[Contribution Number: 1068]**
Anna Sophia Knox (formerly A. Chlopecka), Domy Adriano (Savannah River Ecology Laboratory, University of Georgia)

17:10
Natural Zeolites – Remediation Technology for the 21st Century?**[Contribution Number: 1069]**
Karen Stead (1), Sabeha K. Ouki (1) and Neil I. Ward (2) (1. Centre for Environmental Health Engineering, University of Surrey, UK, 2. ICP-MS Facility, Department of Chemistry, University of Surrey, UK)

17:30
New Approach for Assessing Decontamination Processes by Chemical Speciation Combined with Bioassays**[Contribution Number: 1070]**
Heinz Stichnothe, Alexander Weissbach, Helga Neumann-Hensel, Wolfgang Calmano (Department of Environmental Science and Technology, Technical University Hamburg-Harburg, Germany)

17:50
The Study of Heavy Metal Control by a Fluidized Bed Reactor during Incineration**[Contribution Number: 1071]**
Bo-Chin Chiang, Ming-Yen Wey, Wen-Yi Yang (Department of Environmental Engineering, National Chung Hsing University, Taiwan, Republic of China)

18:10
Mercury in Native Ore Deposits: An Unrecognized, Widespread Source to Lake Superior Sediments**[Contribution Number: 1072]**
W. Charles Kerfoot, S.L. Harting (Lake Superior Ecosystem Research Center and Department of Biological Sciences, Michigan Technological University), Ronald Rossmann (US Environmental Protection Agency, Large Lakes Research Station, Michigan)

Session 11: Air-Water Exchange of Mercury

Chairpersons: Rob Mason (University of Maryland) and Bill Fitzgerald (University of Connecticut)
Location: Vandenberg Room, Michigan League

14:30
The Role of Water Wave Dynamic Processes in the Exchange of Gaseous Mercury at the Air-Sea Interface**[Contribution Number: 1073]**
G. Trombino, I. Hedgecock, L. Forlano, and N. Pirrone (CNR-Institute for Atmospheric Pollution, c/o: UNICAL, Italy)

14:50
Managing Mercury Issues on a Continental Scale**[Contribution Number: 1074]**
Luke Trip (Heavy Metal Air Issues, Environment Canada), R. Allan (Aquatic Ecosystem Research Branch, National Water Institute, Environment Canada), A. Hamilton (Commission for Environmental Cooperation, Canada)

15:10
FEDDS: The Florida Everglades Dry-Deposition Study: Preliminary results from an ongoing investigation of the dry-depositional loading of mercury to the Florida everglades ecosystem**[Contribution Number: 1075]**
Frank J. Marsik, Gerald Keeler, Elizabeth Malcolm, J. Timothy Dvonch, James Barres (Air Quality Laboratory, University of Michigan), Steven E. Lindberg and Hong Zhang (Oak Ridge National Laboratory, Tennessee), Robert K. Stevens (Florida Dept. of Environmental Protection) and Matthew Landis (U.S. Environmental Protection Agency, North Carolina)

15:30
Baie St-François Wetland (Quebec) Mercury Air-Surface Exchange Experiments**[Contribution Number: 1076]**
Laurier Poissant and Martin Pilote (Environment Canada, Québec)

16:30
Sunlight and Fe(III) induced photochemical reduction of Hg(II) in fresh waters**[Contribution Number: 1077]**
H. Zhang and S. Lindberg (Environmental Sciences Division, Oak Ridge National Laboratory, Tennessee)

16:50
Air-Surface Exchange of Mercury over Natural and Impacted Sites in Atlantic Canada**[Contribution Number: 1078]**
Stephen Beauchamp, Robert Tordon, Lisa Phinney, Annick Pinette (Atmospheric Science Division, Environment Canada, Nova Scotia), John Dalzeil (Bedford Institute of Oceanography, Nova Scotia, Canada), Andy Rencz (Geological Survey of Canada), Henry Wong (National Water Research Institute, Environmental Canada, Ontario)

17:10
Investigation of Heavy Metals in Cloud Water Sampled at Multiple North America Locations**[Contribution Number: 1079]**
Elizabeth G. Malcolm, Gerald J. Keeler (Atmospheric, Oceanic and Space Science Department, University of Michigan)

17:30
Dissolved Gaseous Mercury (DGM) Fluxes in Negro River Basin, Brazillian Amazon**[Contribution Number: 1080]**
P.S. Fadini (Instituto de Ciências Biológicas e Químicas, PUCCAMP, Brazil) and W.F. Jardim (Instituto de Química, Universidade Estadual de Caixa Brazil)

17:50
Atmospheric Mercury Species in the Arctic: Measurements and Modelling**[Contribution Number: 1081]**
Torunn Berg (Norwegian Institute for Air Research), Jerzy Bartnicki (DNMI, Norway), John Munthe (IVL, Sweden), Heikki Lattila (FMI, Finland), Jaroslaw Hrehoruk, Andrzej Mazur (IMGW, Poland)

18:10
The Science and Health Effects of Mercury: A Review of Risk and Uncertainty**[Contribution Number: 1082]**
Bruce Lourie (Lourie and Love, Toronto, Canada)

Session 12: Heavy Metals in Soil/Plant/Forest Ecosystems

Chairpersons: Lawrence Duffy (Institute of Arctic Biology) and Neil Ward (University of Surrey)
Location: Henderson Room, Michigan League

14:30
Prediction of Copper and Zinc Concentrations in Plants Based on Soil Characteristics**[Contribution Number: 1083]**
Jennifer K. Saxe, Christopher A. Impellitteri, Herbert E. Allen (Department of Civil and Environmental Engineering, University of Delaware)

14:50
Copper Levels in Soils and Two Crops in Central Chile**[Contribution Number: 1084]**
Patricio H. Rodríguez, Ricardo Badilla-Ohlbaum, Andreas Birkefield, Elena Bustamante, Andres Céspedes (CIMM, Santiago-Chile), Rosanna Ginocchio, Gustabo E. Lagos (Pontificia Universidad Catolica, Santiago-Chile) and Juan C. Torres (CODELCO, Santiago-Chile)

15:30
Impact of Endomycorrhizal Fungi on Plant Trace Element Uptake and Nutrition**[Contribution Number: 1085]**
Neil I. Ward, Karen Stead (ICP-MS Facility, Department of Chemistry, School of Physics and Chemistry, University of Surrey, UK) and John Reeves (Eastleigh, UK)

16:30
Bioavailability of As, Hg and Se from compost-amended soils**[Contribution Number: 1086]**

Valcho D. Zheljazkov (Jeliazkov), Phil R. Warman (Department of Environmental Sciences, Nova Scotia Agricultural College, Canada)

16:50
Effect of Stem-only and Whole-tree Clear-cutting on Heavy Metal Concentrations in Forest Soil and Plants at Two Clear-Cut Areas in Scandinavia**[Contribution Number: 1087]**
Lena Kjøbli Grønflaten (Department of Chemistry, Norwegian University of Science and Technology)

17:10
The Growth and Residual Effect of Applied Rare Earth Elements (REE) on Wheat**[Contribution Number: 1088]**
Yan Beizhan, Liang Tao, Zhang Shen, Wang Lijun (Institute of Geography, CAS, China), Hu Aitang (Nanjing Agricultural University, China)

17:30
Temporal and Spatial Variation of Hg and Pb Concentrations in Northeastern U.S.-Canadian Subalpine Forest Floor Soils**[Contribution Number: 1089]**
G.C. Evans (1), S.A. Norton (2), I.J. Fernandez (3), J.S. Kahl (2,4) and D.W. Hanson (5)
(1. Michigan State University, 2. Department of Geological Sciences, University of Maine, 3. Department of Plant, Soil and Environmental Sciences, University of Maine, 4. Water Research Institute, University of Maine, 5. Cambridge, MA)

17:50
Movement of heavy metals in the eco-environment through trophic levels of food chain**[Contribution Number: 1090]**
K. Jamil (Biology and Biotechnology Division, Indian Institute of Chemical Technology, India)

Session 13: Lead and Lead Poisoning

Chairpersons: Howard Hu (Harvard University) and Kathy Mahaffey (US Environmental Protection Agency, Cincinnati)
Location: Hussey Room, Michigan League

14:30
Blood lead and mortality in the National Health and Nutritional Examination Survey II (NHANES II) cohort**[Contribution Number: 1091]**
M. Lustberg and E. Silbergeld (University of Maryland)

14:50
Evaluation of Blood Lead Concentration in Workers of the Electrical Storage Battery Recuperation Sector and Solder in the Great Cuiabá-MT, Brazil**[Contribution Number: 1092]**
P.A. Rossignoli, E. Castro e Silva, L.J. Oliveira and S.M. Silvestrin (UFMT, Brazil)

15:10
Magnetic Resonance Spectroscopy in the Neurologic Assessment of Adult Lead Poisoning**[Contribution Number: 1093]**
Robert Wright, Robert Mulkren, Roberta White, Antonio Aro, Howard Hu (The Channing Laboratory, Brigham and Women's Hospital, Department of Radiology, Boston Children's Hospital, Harvard Medical School, Boston, VA Hospital, Boston University Medical School, Boston, MA and Department of Pediatrics, Brown Medical School, Providence, RI)

15:30
Influence of Dietary Ascorbic Acid Intake on Lead Mobilized from Bone Among Middle-Aged and Elderly Men: The Normative Aging Study**[Contribution Number: 1094]**

Shirng-Wern Tsaih, Susan Korrick, Joel Schwartz, Chitra Amarasiriwardena, Antonio Aro (Occupational Health Program, Harvard School of Public Health, Massachusetts), David Sparrow (The Normative Aging Study, Department of Veterans Affairs Outpatient Clinic, Massachusetts), Howard Hu (Occupational Health Program, Harvard School of Public Health, Massachusetts)

16:30
New Isotopic Evidence for Chronic Lead Contamination in the San Francisco Bay and Implications for the Persistence of Past Industrial Lead Emissions in the Biosphere**[Contribution Number: 1095]**
Douglas J. Steding, Charles Dunlap and A. Russell Flegal (Earth Sciences and Environmental Toxicology, University of California, Santa Cruz)

16:50
Contribution of Lead in Wine to the Total Dietary Intake of Lead in Humans with and without a Meal – A Pilot Study**[Contribution Number: 1096]**
Brian L Gulson (1, 4), Creina S. Stockley (2), Brian Gray (3), Karen J. Mizon (4), Nicole Patison (4)
1. Graduate School of the Environment, Macquarie University, Australia
2. The Australian Wine Research Institute, South Australia, Australia
3. School of Chemsitry, Macquarie University, Australia
4. CSIRO Division of Exploration and Mining, Australia

17:10
Lead in bone: internal source and target organ?**[Contribution Number: 1097]**
D. Nash and E. Silbergeld (New York City Health Department and Department of Epidemiology and Preventive Medicine and University of Maryland Medical School)

17:30
Longitudinal Study of Daily Intake and Excretion of Lead in Newly-Born Infants**[Contribution Number: 1098]**
Brian L. Gulson (1,2), Karen J. Mizon (1, 2), Jacqueline M Palmer (2), Nicole Patison (2), Alistair J. Law (2), Michael J. Korsch (2), Kathryn R. Mahaffey (3), John A. Donnelly (4) (1. Graduate School of the Environment, Macquarie University, Australia, 2. CSIRO/DEM, Australia, 3. US Environmental Protection Agency, Washington, DC, 4. Statistical consultant, Castle Hill, Australia)

17:50
Environmental Lead Contamination and Pediatric Lead Intoxication in an Andean Village**[Contribution Number: 1099]**
S. Allen Counter, Leo H. Buchanan, Chitra Amarsiriwardena, Nadir Rifai, Howard Hu (Harvard University and Affiliated Institutions, Massachusetts), Fernando Ortega (Universidad San Francisco de Quito, Quito, Ecuador)

Session 14: Analytical

Chairpersons: Andre Tessier (University of Quebec) and Joel Blum (University of Michigan)
Location: Henderson Room, Michigan League

9:30
TIMS for the Reliable Determination of Lead Concentrations and the Isotopic Ratios in Antarctic Snow and Ice**[Contribution Number: 1100]**
Kevin Rosman, Katja Van de Velde, Paul Vallelonga, Jean-Pierre Candelone (Departement of Applied Physics, Curtin University of Technology, Australia), Frédéric Planchon, Claude Boutron (Laboratoire de Glaciologie et Geophysique de'l Environnement du CNRS, Domaine Universitaire, France) and V.I. Morgan (Antarctic CRC and Australian Antarctic Division, Australia)

9:50
Investigation of Natural Fractionation of Stable Mercury Isotopes by Multi-Collector Inductively Coupled

Plasma Mass Spectrometry**[Contribution Number: 1101]**
Bjorn Klaue, Stephen E. Kesler and Joel D. Blum (Geological Sciences, University of Michigan)

10:10
A Stable Isotope Approach to the Study of the Association of Heavy Metals with Different Soil Components**[Contribution Number: 1102]**
Jeffrey R. Bacon and Irene J. Hewitt (Macaulay Land Use Research Institute, Aberdeen, UK)

11:00
Investigation of Sequential Extractions methods for Determination of Mercury Species in Sediments**[Contribution Number: 1103]**
Chris Sladek (Department of Geological Sciences) and Mae Sexauer Gustin (Department of Environmental and Resource Science, University of Nevada)

11:20
Determination of Mercury Species Using ICP/MS Techniques**[Contribution Number: 1104]**
Holger Hintelmann (Trent University, Department of Chemistry, Peterborough, Canada)

11:40
Environmental Mercury Speciation Analysis by Flow-Hyphenation Techniques**[Contribution Number: 1105]**
C.M. Tseng (Department of Marine Science, University of Connecticut) and O.F.X Donard (Laboratoire de Chimie Bio-Inorganique et Environnement, France)

12:00
A peat reference material for trace element analysis**[Contribution Number: 1106]**
C. Barbante (Department of Environmental Sciences, University of Venice, Italy), W. Shotyk (Geological Institute, University of Berne, Switzerland), H. Biester (Institute of Environmental Geochemistry, University of Neidelberg, Germany) A. Cheburkin (EMMA Analytical. Canada), H. Emons (Environmental Specimen Bank, Germany), J. Farmer (Department of Chemistry, University of Edinburgh, Scotland), E. Hoffman (ACTLABS, Ontario, Canada), A. Cortizas (Department of Soil Science and Agricultural Chemistry, University of Santiago de Compostela, Spain), J. Matschullat (Interdisciplinary Centre for Environmnetal Studies, University of Freiberg, Germany), S. Norton (Department of Geology, University of Maine, ME), J. Schweyer (Ontario Geological Survey, Canada), E. Steinnes (Department of Chemistry, University of Trondheim, Norway)

Session 15: Environmental Impacts of Mining and Smelting

Chairpersons: Rod Allan (Environment Canada, Burlington, Ontario) and Wilfried Ernst (Vrije University)
Location: Hussey Room, Michigan League

9:30
Identification and Distribution of Arsenic Species in an Iron-Oxidizing Microbial Mat Community**[Contribution Number: 1107]**
Andrea L. Foster, Roger P. Ashley, and James J. Rytuba (U.S. Geological Survey, California)

9:50
Concentrations and Distributions of Heavy Metals in Naturally Growing Vegetation at Different Distances from a Zinc Smelter**[Contribution Number: 1108]**
Hilde-Gunn Jensen (Department of Chemistry, Norwegian University of Science and Technology)

10:10
Mushrooms from a Copper Contaminated Birch Forest: Concentrations of Heavy Metals and Metallothioneins and Superoxide Dismutase Activity**[Contribution Number: 1109]**
Christian Collin-Hansen (Department of Chemistry, Norwegian University of Science and Technology)

11:00
Copper Tolerance Testing on Mimulus Cupreus Dombr., Scrophularaceae, in Populations Exposed and Non-Exposed to Copper Mine Pollution**[Contribution Number: 1110]**
R. Ginocchio, I. Toro (Departamento de Ecología, Pontificia Universidad Católica de Chile, Chile) and D. Schnepf (Institute for Soil Science, Agricultural University, Vienna, Austria)

11:20
The Antagonistic Effect of Selenium on Mercury Uptake by Freshwater Fish**[Contribution Number: 1111]**
N. Belzile, Y.W. Chen (Department of Chemistry & Biochemistry, Laurentian University, Ontario, Canada) and J. Gunn (Cooperative Freshwater Ecology Unit, Laurentian University, Ontario, Canada)

11:40
Heavy Metal Input to the Niepolomice Forest (S Poland)- Changes during 20 Years**[Contribution Number: 1112]**
Grazyna Szarek-Lukasewska, Krystyna Grodzinska, Barbara Godzik (W. Szafer Institute of Botany Polish Academy of Science)

12:00
Mercury in Soils at the Abandoned Red Devil Mine in Southwest Alaska**[Contribution Number: 1113]**
Elizabeth A. Bailey (U.S. Geological Survey, Alaska), Mark E. Hines (Dept. of Biological Sciences, University of Alaska Anchorage), John E. Gray, Peter M. Theodorakos (U.S. Geological Survey, Colorado)

Session 16: Heavy Metals in River/Lake and Estuaries

Chairpersons: Russ Flegal (University of California, Santa Cruz) and Sam Luoma (U.S. Geological Survey, Menlo Park, CA)
Location: Vandenberg Room, Michigan League

9:30
Trace Metal Distribution in Surface Sediments from the Eastern Brazilian Coast**[Contribution Number: 1114]**
L. Guedes, C.M.M. Souza, C.E.V. Carvalho, A.R.C. Ovalle, C.E. Rezende and M.G. Almeida (Laboratório de Ciências Ambientais, CBB, UENF, Brazil)

9:50
Mercury and Copper Contamination from Historic and Recent Mining Activities in the Camaqu? River Basin, South Brazil**[Contribution Number: 1115]**
M.H. Pestana (Fundaçao Estadual de Proteçao Ambiental Henrique Luís Roessler, Rio Grande do Sul, Brazil), M. Formoso (Centro de Estudos em Petrologia e Geoquímica, Universidade Federal do Rio Grande do Sul, Brazil), P. Lechler (Nevada Bureau of Mines and Geology, University of Nevada)

10:10
Geochemical Study of Heavy Metals in Bottom Sediments and Border Soils from a Lacustrine System of Cima Lake, RJ, Brazil**[Contribution Number: 1116]**
M.G. Almeida, C.M.M. de Souza, and L. Guedes (Laboratório de Ciências Ambientais, CBB, Universidade Estadual do Norte Fluminense, Brazil)

11:00
Heavy Metals Geochemistry in the Sediments of a Brazilian Mangrove**[Contribution Number: 1117]**
Glauca Torres Aragon and Fabricio Lima da Silva (Laboratório de Ciências Ambientais, Universidade Estadual do Norte Fluminense, Brazil)

11:20
Heavy metal composition of sediments in the middle and lower course of the Volga River, Russian

Federation**[Contribution Number: 1118]**
German Mueller, A. Yahya, R. Ottenstein (Institute of Environmental Geochemistry, University of Heidelberg, Germany), V. Raynin, N. Kolomiytsev (Russian Academy of Agricultural Sciences), V. Naydenko, S. Sobol (Nizhny Novgorod State University, Nizhny Novgorod), P. Shagidullin, and V. Trofanchuk (Ministry of the Environment, Rep. Tatarstan, Kazan)

11:40
Heavy Metal Concentrations in Sediments and Suspended Particulate Matter from Mar Chiquita Coastal Lagoon, Argentina**[Contribution Number: 1119]**
L. Ferrer, S. Andrade, J. Marcovecchio (Instituto Argentino de Oceanografia, Argentina), S. De Marco and A. Gavio (Universidade Nacional de Mar del Plata, Argentina)

12:00
Heavy Metals Distribution in the Estuarine Ecosystem of Bahia Blanca, Argentina**[Contribution Number: 1120]**
L. Ferrer, S. Andrade, R. Asteasuain, J. Marcovecchio (Instituto Argentino de Oceanografia, Argentina) and A. Pucci (Centro Nacional Patagónico, Argentina)

Session 17: Lake Michigan Mass Balance for Mercury

Chairpersons: Ron Rossmann (US Environmental Protection Agency, Grosse Ile, MI), and James Hurley (University of Wisconsin)
Location: Michigan Room, Michigan League

9:30
Mercury in the Atmosphere of Lake Michigan**[Contribution Number: 1121]**
Gerry Keeler, et al. (Department of Environmental Health Sciences, School of Public Health, University of Michigan)

9:50
Influences of Watershed Characteristics on Total and Methyl Mercury Levels in Lake Michigan Tributaries**[Contribution Number: 1122]**
James P. Hurley (1, 2), Kristofer R. Rolfhus (3), Martin M. Shafer (3), and Peter E. Hughes (4)
1. Water Resources Institute, University of Wisconsin
2. Bureau of Integrated Science Services, Wisconsin Department of Natural Resources
3. Water Chemistry Program, University of Wisconsin
4. US Geological Survey, Wisconsin

10:10
Mercury in the Water Column of Lake Michigan**[Contribution Number: 1123]**
Robert P. Mason (Chesapeake Biological Laboratory, University of Maryland), Kristen A. Sullivan (Pfizer, Connecticut)

11:00
Mercury in Phytoplankton and Zooplankton**[Contribution Number: 1124]**
Edward A. Nater, Deborah L. Swackhamer, Jacob A. Fleck (University of Minnesota)

11:20
Mercury in Fish in Lake Michigan**[Contribution Number: 1125]**
Jerome Nriagu and Xia Qin Wang (Department of Environmental Health Sciences, School of Public Health, University of Michigan)

11:40
Mercury in and Fluxes to Lake Michigan Surficial Sediments**[Contribution Number: 1126]**

Ronald Rossmann (United States Environmental Protection Agency, Mid-Continent Ecology Division – Michigan)

12:00
A Modeling Framework for Mercury Cycling in Lake Michigan**[Contribution Number: 1127]**
Xin Zhang (PAI/SAIC, Large Lakes Research Station, Michigan) and Kenneth R. Rygwelski (US EPA, Large Lakes Research Station, Michigan)

Session 18: Analytical

Chairpersons: Brian Gulson (Macquarie University, Australia) and Ali Bazzi (University of Michigan)
Location: Henderson Room, Michigan League

14:30
Analysis of variations in Pb and Cu complexation by natural organic matter across Connecticut watersheds**[Contribution Number: 1128]**
M. Morrison and G. Benoit (Yale School of Forestry and Environmental Studies, Connecticut)

14:50
Characterization of Natural Colloids with Field-Flow-Fractionation (FFF) Techniques for the Assessment of Colloid Assisted Transport of Heavy Metals**[Contribution Number: 1129]**
Frank von der Kammer (Department for Environmental Science and Technology, Technical University Hamburg-Harburg, Germany)

15:10
An Investigation of Freshwater Humic Material Using Liquid Chromatography/ Mass Spectrometry**[Contribution Number: 1130]**
Brain K. Dimock (Department of Chemistry, Trent University, Ontario, Canada)

15:30
Factors Influencing Metals Recovery from Wastewaters by Ion Exchange**[Contribution Number: 1131]**
M. Lasheen, A. Ashmawy and H. Ibrahim (Department of Water Pollution, National Research Center, Cairo, Egypt)

16:30
A Comparison of Solvent and Gel Electrophoretic Techniques in the Extraction of Humic Substances from Soils: Application to the Investigation of U-Humic Interactions in a Coniferous Forest Soil**[Contribution Number: 1132]**
Margaret C. Graham (Department of Chemistry, University of Edinburgh, Scotland), Susan I. Vinogradoff, Anthony Abbott (Westlakes Scientific Consulting, England) and John G. Farmer (Department of Chemistry, University of Edinburgh, Scotland)

16:50
Analytical Application of Supported Liquid Membranes in Trace Metal Extraction and Speciation**[Contribution Number: 1133]**
Kuria Ndungu (Environmental Toxicology Department/WIGS, University of California, Santa Cruz), Nii-Kotey Djane, Lennart Mathiasson and Jan Åke Jönsson (Department of Analytical Chemistry, Lund University, Sweden)

17:10
Aqueous Speciation of Copper, Manganese, Cadmium and Zinc in the Elizabeth River Estuary (Norfolk, VA) Measured Using the Diffusion Gradient in Thin-FilmTechnique**[Contribution Number: 1134]**
Michael R. Twiss (Department of Chemistry, Biology and Chemical Engineering, Ryerson Polytechnic

University, Ontario, Canada) and James W. Moffett (Department of Marine Chemistry and Geochemistry, Woods Hole Oceanographic Institution, Massachusetts)

17:30
Seasonal changes of metal forms in a mining region recipient measured by filter and DEAE fractionation**[Contribution Number: 1135]**
Å. Sjöblom (Department of Water and Environmental Studies, Linköping University, Sweden) and K. Håkansson (Swedish Geotechnical Institute, Sweden)

17:50
Heavy Metal and other Element Analysis of Water and Sediment Samples using ICP-MS without Argon-Based Interferences**[Contribution Number: 1136]**
Fadi Adou- Shakra and David Churchman (Micromass UK Ltd., United Kingdom)

Session 19: Environmental Impacts of Mining and Smelting

Chairpersons: Arthur Hotowitz (US Geological Survey, Atlanta) and J.P. Vernet (University of Geneva)
Location: Michigan Room, Michigan League

14:30
Mercury Content of Soils in the Vicinity of a Past-Producing Mercury Mines, Central British Columbia, Canada**[Contribution Number: 1137]**
A. Plouffe, G.E.M. Hall, and P. Pelchat (Geological Survey of Canada)

14:50
Environmental Effects of Abandoned Mercury Mines in the Humboldt River Basin Nevada, USA**[Contribution Number: 1138]**
John E. Gray, James G. Crock, and David L. Fey (U.S Geological Survey, Colorado)

15:10
Aqueous Geochemistry of Mercury in Three River Systems Impacted by Mining Activities**[Contribution Number: 1139]**
Jean-Claude Bonzongo (Environmental Studies, Austin College, Texas), W.B. Lyons (Byrd Polar Research Center, Ohio State University), J.J. Warwick (Dept. of Environmental Engineering Sciences, University of Florida), Jadran Faganelli (Marine Biological Station, Slovenia), Milena Horvat (Jozef Stefan Institute, Slovenia), M.E. Hines (Dept. of Biology, University of Alaska), P.J. Lechler and J. Miller (University of Nevada)

15:30
The Impact of Mercury Mining on the Environment and Human Health in the Wider Idrija Region, Slovenia, and in the Gulf of Trieste**[Contribution Number: 1140]**
Milena Horvat (1), Vesna Jereb (1), Martina Logar (1), Vesna Fajon (1), Vesna Miklavcic (2), Alfred Kobal (2), Mark Hines (3), Jadran Faganeli (4)
1. Department of Environmental Sciences, Jozef Stefan Institute, Slovenia
2. Mercury Mine Idrija, Slovenia
3. University of Alaska Anchorage
4. National Institute for Biology, Marine Biological Station, Slovenia

16:30
Preliminary Results from a Study of Metals in Lake Sediment around the Smelter at Rouyn-Noranda, Québec**[Contribution Number: 1141]**
Deborah Kliza (Geological Survey of Canada, Ontario), Kevin Telmer (University of Victoria, British Columbia, Canada), Gwendy Hall, Graeme Bonham-Carter and Sam Alpay (Geological Survey of Canada, Ontario)

16:50
The Chemical Speciation of Zn in the Sediments of a Lake Impacted by a Zn Smelter**[Contribution Number: 1142]**
Jean-Francois Gaillard, Samuel M. Webb (Department of Civil Engineering, Northwestern University, Illinois), Gary G. Leppard (National Water Research Institute, CCIW, Ontario, Canada)

17:10
Effect of Mining and Related Activities on the Sediment Trace Element Geochemistry of the Spokane River Basin, Washington, USA**[Contribution Number: 1143]**
Cecile A. Grosbois (BRGM, Direction de la Recherche, France), Arthur J. Horowitz, James J. Smith and Kent A. Elrick (U.S. Geological Survey, Georgia)

17:30
The Heavy Metal Contamination of the Odra River System**[Contribution Number: 1144]**
Kai Behrens, Arndt Knöchel, Anne-Katrin Meyer (Institute of Inorganic and Applied Chemistry, University of Hamburg, Germany), Edeltrauda Helios-Rybicka, Magdalena Strzebonska, Ewa Adamiec (Department of Environmental Protection, University of Mining And Metallurgy, Poland), Peter Beuge, Annia Greif, Werner Klemm (Institute of Mineralogy, Technical University Bergakademie Freiberg, Germany), Mikolaj Protasowicki (Department of Toxicology, Agricultural University, Poland)

17:50
The Special Heavy Metal Contamination of the Mulde River System**[Contribution Number: 1145]**
Arndt Knöchel, Anne-Katrin Meyer, Markus Cichon (Institute of Inorganic and Applied Chemistry, University of Hamburg, Germany) Peter Beuge, Andreas Kluge, Werner Klemm (Institute of Mineralogy, Technical University Bergakademie Freiberg, Germany)

Session 20: Heavy Metals in Rivers/Lakes and Estuaries

Chairpersons: Nicola Pirrone (CNR-Institute for Atmospheric Pollution, Italy) and German Mueller (Institute of Environmental Research, University of Heidelberg)
Location: Vandenberg Room, Michigan League

14:30
Silver in Sediments of the Elbe River, its Estuary and in the North Sea**[Contribution Number: 1146]**
German Muller (Institute of Environmental Geochemistry, Heidelberg University, Germany)

14:50
Heavy Metals Pollution into the Marano Lagoon in Northern Italy**[Contribution Number: 1147]**
A. Piacenti, M. Ferrini, F. La Marca (Department of Chemical, Materials, Raw Materials and Metallurgical Engineering, University of Rome, Italy) and L. Piga (National Research Council, Italy)

15:30
Iron Plaque Formation on the Roots of Mangrove Seedlings**[Contribution Number: 1148]**
W. Machado, L.D. Lacerda (Dept. Geoquímica, Universidade Federal Fluminense, Brazil)

16:30
Covariance of Gradients in the Carbon and Nitrogen Isotopic Ratios in Surface Sediments and Total Dissolved Metal Concentrations in the San Francisco Bay Estuarine System**[Contribution Number: 1149]**
Mara Ranville and James Zachos (Earth Sciences, University of California, Santa Cruz) and A.R. Flegal (Environmental Toxicology, University of California, Santa Cruz)

16:50
Pb and Hg Distribution in Dated Sediment Cores from a Remote Headwater Lake at Itatiaia Mountains, SE Brazil**[Contribution Number: 1150]**
L.D. Lacerda, M.G. Ribeiro, Jr., and J.J. Abrao (Dept. Geoquimica, Universidade Federal Fluminense, Brazil)

17:10
Biogeochemistry of Mercury in Three European Estuaries (Gironde, Scheldt and Rhine)**[Contribution Number: 1151]**
C.M. Tseng (Department of Marine Science, University of Connecticut), D. Amouroux, O.F.X Donard, O.F.X. (Laboratoire de Chimie Bio-Inorganique et Environment, CNRS EP132, Université de Pau et de ladour, France)

17:30
Heavy Metals Transport and Distribution over the Abiotic Components of the OB River Aquatic Ecosystems (West Siberia, Russia)**[Contribution Number: 1152]**
Tatyana S. Papina, Sergei V. Temerev, Alla N. Eyrikh (Institute for Water and Environmental Problems, Siberian Branch of the Russian Academy of Sciences)

17:50
Potential Ecological Risk Index for Heavy Metals – Assay in Guanabara Bay, Rio de Janeiro, Brazil**[Contribution Number: 1153]**
A.N. Campos, E.D. Bidone (Departmento de Geoqúimica, Universidade Federal Fluminense, Brazil)

Session 21: Health Effects of Heavy Metals

Chairpersons: Philippe Grandjean (University of Southern Denmark) and Donna Mergler (University of Quebec)
Location: Hussey Room, Michigan League

14:30
Manganese Accentuates Adverse Mental Health Effects Associated with Alcohol Use Disorders**[Contribution Number: 1154]**
Marie-Pascale Sassine, Donna Mergler (CINBIOSE, University of Quebec in Montreal, Canada), Rosemarie Bowler (Psychology Department, San Francisco State University, California), H. Kenneth Hudnell (US Environmental Protection Agency, North Carolina)

14:50
A Comparative Study of Manganese and Lead Levels in Human Umbilical Cords and Maternal Blood from Two Urban Centers Exposed to Different Gasoline Additives**[Contribution Number: 1155]**
Audrey Smargiassi (CINBIOSE, University of Quebec in Montreal, Canada), Huel Guy, Hellier Georgette (INSERM, Research in Epidemiology, France), Masse Andre, Sergerie Martin (CHUM, St. Luc Hospital, Quebec, Canada), Mergler Donna (CINBIOSE, University of Quebec in Montreal, Canada)

15:10
Possible Effects of Chronic Exposure to Environmental Airborne Manganese on Neurological Function in Children**[Contribution Number: 1156]**
H. Kenneth Hudnell (US Environmental Protection Agency, North Carolina), Donna Mergler (University of Quebec at Montreal, Canada), and Richard A. Wittberg (Center for Research on Urban Toxics)

15:30
Brain MRI in Manganese Exposed Workers and Hepatopatic Patients**[Contribution Number: 1157]**
Roberto Lucchini, Elisa Albini, Laura Benedetti, Lorenzo Alessio (Institute of Occupational Health, University of Brescia, Italy) Roberto Gasparotti (Department of Neuroradiology, University of Brescia, Italy)

16:30
Manganese in Well Water: Exposure in the Eastern Townships of Quebec (Canada)**[Contribution Number: 1158]**
Audrey Smargiassi, Robyn Bryan, Donna Mergler, Mary Baldwin (CINBIOSE, University of Quebec in Montreal, Canada), Joseph Zayed (Department of Hygiene and Occupational Health, University of Montreal, Canada)

16:50
Neurophysiological sequelae of welding**[Contribution Number: 1159]**
Rosemarie Bowler (Department of Psychology, San Francisco State University,California)

17:10
Hazards from Lead in Ceramic Dinnerware: Antiquity to the year 2000**[Contribution Number: 1160]**
R. Sheets (Department of Chemistry, Southwest Missouri State University)

17:30
Mercury: Effects on Host Resistance to Intracellular Pathogens**[Contribution Number: 1161]**
Ellen Silbergeld (1), Bernadette Ramirez (2), John Sacci (1, 3), Abdu Azad (1)
1. University of Maryland Medical School
2. University of Philippines
3. Naval Medical Research Institute, Maryland

17:50
Delayed Neurotoxicity due to Developmental Exposure to Methylmercury**[Contribution Number: 1162]**
Phillippe Grandjean (University of Southern Denmark), Pal Weihe (Boston University Schools of Medicine and Public Health, Massachusetts), Roberta F. White (Faroese Hospital System, Torshavn, Faroe Islands)

Session 22: Sources and Transport

Chairpersons: Jozef Pacyna (Norwegian Institute of Air Research) and William Landing (Florida State University)
Location: Hussey Room, Michigan League

9:30
The History of Large-Scale Atmospheric Lead Pollution in Sweden**[Contribution Number: 1163]**
Ingemar Renberg, Maja-Lena Brännvall, Richard Bindler (Department of Ecology and Environmental Science, Umeå University, Sweden), Ove Emteryd (Department of Forest Ecology, Swedish University of Agricultural Sciences)

9:50
Evidence of Long-range Transport of Aerosols in the Southern Hemisphere from Measurements of Lead Isotopes**[Contribution Number: 1164]**
Kevin Rosman, Andreas Bollhofer, Graeme Burton (Department of Applied Physics, Curtin University of Technology, Australia) and Alan Dick (IASOS, University of Tasmania, Australia)

10:10
Historical Changes in Pb Concentrations and 206Pb/207Pb Ratios in Tree-Rings of Sycamore, Oak and Scots Pine in Northwest England**[Contribution Number: 1165]**
Shaun A. Watmough and Thomas C. Hutchinson (Environmental and Resource Studies Program, Trent University, Canada)

11:00
Silver in the World Ocean**[Contribution Number: 1166]**
A.R. Flegal (Environmental Toxicology, WIGS, University of California, Santa Cruz)

11:20
Metal Contamination of the Natural Environment in Norway from Long Range Atmospheric Transport**[Contribution Number: 1167]**
Eiliv Steinnes (Department of Chemistry, Norwegian University of Science and Technology)

11:40
Trace Element Composition of the Eastern Mediterranean Aerosols: Indicators for Distant Source Regions**[Contribution Number: 1168]**
Gülen Gullu, Gürdal Tuncel (Middle East Technical University, Dept. Environmental Engineering, Turkey), Ilhan Olmez (Tubitak-Marmara Research Center, Turkey)

12:00
Heavy Metal Concentrations and Fluxes in a Remote Boreal Forest Ecosystem in Finland**[Contribution Number: 1169]**
Liisa Ukonmaanaho and Michael Starr (Finnish Forest Research Institute)

12:20
Rainfall Deposition of Heavy Metals in Florida: Long Range Transport and Local Sources**[Contribution Number: 1170]**
Jerome J. Perry Jr. and William M. Landing (Department of Oceanography, Florida State University)

12:40
Understanding Processes Influencing Patterns of Chemical Loadings to the Environment: Sources, Pathways, and Environmental Regulations**[Contribution Number: 1171]**
Sharon J. Simpson, Joel D. Fett, David T. Long, Lina Patino (Department of Geological Sciences, Michigan State University)

Session 23: Alpine and Polar Ecosystems

Chairpersons: Claude Boutron (University of Grenoble) and Roy Harrison (University of Birmingham)
Location: Vandenberg Room, Michigan League

9:30
Determination of Surface Level Concentrations of Atmospheric Mercury in Antarctica**[Contribution Number: 1172]**
R. Ebinghaus (1), C. Temme (1), H.H. Kock (2), A. Loewe (2) and S.R. Schmolkel (1).
1. GKSS Research Centre Geesthacht, Germany
2. Alfred-Wegener-Institute for Polar and Marine Research, Germany

9:50
Intensive Measurements of Atmospheric Mercury in Antarctica**[Contribution Number: 1173]**
F. Sprovieri and N. Pirrone (CNR-Institute for Atmospheric Pollution, c/o: UNICAL, Italy)

10:10
Atmospheric Mercury Depletions in the Canadian High Arctic: Preliminary Results from Alert 2000, An International Field Study**[Contribution Number: 1174]**
Alexandra Steffen, Bill Schroeder and Julia Lu (Atmospheric Environment Service, Ontario, Canada

11:00
Mercury Cycling in Perennially Frozen Soils of Arctic Canada, Kaminak Lake Area, Nunavut**[Contribution Number: 1175]**
Isabelle McMartin, Gwendy Hall, John Kerswill, Al Sangster and Judy Vaive (Geological Survey of Canada, Ontario)

11:20
Lead Isotops in the Seasonal Snow Cover in the French Alps**[Contribution Number: 1176]**
Audrey Veysseyre (1), Christophe Ferrari (1,2), Andreas Bolhofer (3), Kevin Rosman (3), and Claude Boutron (1,4).
1. Laboratoire de Gaciologie et Géophysique de l'Environnement du CNRS, France

2. Institut des Sciences et Techniques de Grenoble, Universite Joseph Fourrier de Grenoble, France
3. Department of Applied Physics, Curtin University of Technology, Australia
4. Unites de Formation et de Recherche de Mecanique et de Physique, Universite Joseph Fourrier de Grenoble, France

11:40
Trace Element Distribution in Surface Winter Snow of the Eastern Alps (Italy) in Relation to Meteorological Conditions**[Contribution Number: 1177]**
Carlo Barbante, Paolo Cescon, Gabriele Capodaglio (Centro di Studio sulla Chimica e le Tecnologie per l'Ambiente - CNR and Dipartimento di Scienze Ambientali, Università di Venezia, Italia), Giulio Cozzi, Paolo Gabrielli (Dipartmento di Scienze Ambientali, Università di Venezia, Italia), Clara Turetta (Centro di Studio sulla Chimica e le Tecnologie per l'Ambiente - CNR Venezia, Italia) and Sandro Torcini (Dipartimento Ambiente, ENEA, Roma)

12:00
Mercury Dynamics in Snow**[Contribution Number: 1178]**
J.D. Lalonde, A.J.M. Poulain, and M. Amyot (INRS-Eau, Université du Quebec, Canada)

12:20
Historical Trends of Stable Lead Isotops, Mercury and othe Trace Metals in Marine Bivalve Shells from the Canadian Arctic**[Contribution Number: 1179]**
Peter M. Outridge, Roger McNeely and Art Dyke (Geological Survey of Canada, Ontario)

12:40
Temporal and Spatial Trends of Mercury in Arctic Lake Sediments from West Greenland**[Contribution Number: 1180]**
R. Bindler, I. Renberg (Dept of Ecology and Environmental Science, Umeå University, Sweden) and N.J. Anderson (Dept of Geography, University of Copenhagen, Denmark)

Session 24: Water and Wastewater

Chairpersons: Anders Andren (University of Wisconsin) and Steve Norton (University of Maine)
Location: Michigan Room, Michigan League

9:30
Electrolytic Recovery of Cyanide and Heavy Metals from Cyanide Liquors and Effluents**[Contribution Number: 1181]**
R.L.C. Santos and L.G.S. Sobral (CETEM-Centro de Tecnologia Mineral, Cidade Universitaria, Brazil)

9:50
Issues in the management of mercury wastes and waste sites**[Contribution Number: 1182]**
F. Anscombe and J. Nriagu (US EPA & School of Public Health, University of Michigan)

10:10
Formic, Citric and Oxalic Acids as Assisting Agents for the Electrodialytic Removal of Cu, Cr and As from CCA Treated Timber Waste**[Contribution Number: 1183]**
Alexandra B. Ribeiro, Eduardo P. Mateus (Departmento de Ciéncias e Engenharia do Ambiente, Universidade Nova de Lisboa, Portugal), Lisbeth M. Ottosen (Department of Geology and Geotechnical Engineering, Technical University of Denmark), Rui L. Cabrita (Departmento de Pedologia, Estação Agronómica Nacional, Portugal)

11:00
Zinc and Copper Accumulation in Sediments Impacted by Landfill Wastewaters in Jardim Gramacho, SE Brazil**[Contribution Number: 1184]**

W. Machado (Dept. Geoquímica, Universidade Federal Fluminense, Brazil), M.F. Carvalho (PETROBRÁS, CENPES, DIVEX, CEGEQ, Brazil), M. Moscatelli, L.G. Rezende, J.E.L Maddock, R.E. Santelli, L.D. Lacerda (Dept. of Geoquímica, Universidade Federal Fluminense, Brazil)

11:20
Silver Complexation in Surface Freshwater and Effluent**[Contribution Number: 1185]**
Russell T. Herrin, Anders W. Andren, Martin M. Shafer and David E. Armstrong (Water Chemistry Program, University of Wisconsin-Madison)

11:40
Accumulation rates of pollutants and constituents of marine aerosol during the Holocene at Lake Arresjoen, Svalbard, Norway**[Contribution Number: 1186]**
S.A. Norton (University of Maine), E. Fjeld, S. Rognerud (Norwegian Institute for Water Research), and G.L. Jacobson Jr. (University of Maine)

12:00
Heavy metals in the arctic, AMAP Phase II plan**[Contribution Number: 1187]**
S. Marcy (Office of Research and Development, US EPA)

12:20
Bacterial Diversity at a Mixed Waste Contaminated Site**[Contribution Number: 1188]**
Janet Joynt, Cindy Nakatsu (Department of Agronomy, Purdue University, Indiana), Allan Konopka (Department of Biology, Purdue University, Indiana)

Session 25: Bioadsorption and Biomonitoring

Chairpersons: David Long (Michigan State University) and Brigmark (Norwegian Institute of Air Research)
Location: Henderson Room, Michigan League

9:30
Use of Analytical Methods to Determine Heavy Metal Concentration or Location in Fruiting Structures of Slime Molds (Myxomycetes)**[Contribution Number: 1189]**
Carolyn J. McQuattie (USDA Forest Service, Ohio) and Steven L. Stephenson (Department of Biology, Fairmont State College, West Virginia)

9:50
Bacterial Biosensors to Quantify Bioavailable Concentration of Heavy Metals in Polluted Soils to Predict Their Risk of Transfer to the Food Chain**[Contribution Number: 1190]**
P. Corbisier, C. Tibarzawa, D. van der Lelie (VITO, Environmental Technology Centre, Belgium, J. Vangronsveld (Limburgs Universitair Centrum, Environmental Biology, Universitaire Campus, Belgium), M. Mensch (INRA, Unité d4Agronomie-BGETA, France)

10:10
Comparison of Standard and Differential Biomonitoring using Transplants**[Contribution Number: 1191]**
M.C. Freitas, M.A. Reis, A.P. Marques (ITN-Instituto Tecnológico e Nuclear, Portugal)

11:00
Heavy Metals in Edible Wild-Growing Mushrooms in Norway**[Contribution Number: 1192]**
Trond Magne Storstad (Department of Chemistry, Norwegian University of Science and Technology)

11:20
Tracing the transport and behavior of anthropogenic Pb in soils using isotopic ratios**[Contribution Number:**

1193]
Y. Erel (Institute of Earth Sciences, The Hebrew University, Israel)

11:40
Chromium Resistance of Bacteria from Contaminated Soil**[Contribution Number: 1194]**
Cindy H. Nakatsu (Department of Agronomy, Purdue University, Indiana) Jennifer Stegar, David Petros and Allan Konopka (Dept Biological Sciences, Purdue University, Indiana)

12:00
New Principles of Heavy Metals Bioidentification in Fresh Water**[Contribution Number: 1195]**
Valerii Tonkopii, Svetlana E. Slotina (Institute for Lake Research, Russian Academy of Sciences)

POSTER SESSION I
15:50 Monday (August 7) and 10:30 Tuesday (August 8)
Location: Alumni Center, University of Michigan

Mercury in the Atmosphere

I-1.
Mercury species in smelter and power plant plumes**[Contribution Number: 1196]**
J. Lu, C.M. Banic, and W.H. Schroeder (Meteorological Service of Canada, Environment Canada, 4 Ontario)

I-2.
Measurement of particulate and reactive gaseous mercury, RGM, in the ambient air: Methods development**[Contribution Number: 1197]**
M. Lynam, J. Dvonch, and G. Keeler (University of Michigan Air Quality Laboratory), M. Landis (US EPA National Exposure Research Laboratory, North Carolina) and R. Stevens (Florida Department of Environmental Protection)

I-3.
Heavy metals quantification on alkaline batteries incineration emission**[Contribution Number: 1198]**
S. Xará, M. Almeida, C. Costa (Laboratório de Engenharia de Processos, Universidade do Porto, Portugal), M. Silva (Escola Superior de Biotecnologia, Universidade Católica Portuguesa, Portugal)

I-4.
Measurements of total gaseous mercury in Alberta, Canada: effects of meteorology and local emissions**[Contribution Number: 1199]**
M. Kellerhals and K. McDonald (Environment Canada)

I-5.
Vertical distribution of mercury compounds in the atmosphere**[Contribution Number: 1200]**
K. Kvietkus and J. Sakalys (Atmospheric Pollution Research Laboratory, Institute of Physics, Lithuania)

I-6.
Evaluation of mercury atmospheric contamination in a dental office using the transplanted Spanish moss (Tillandsia usneoides, L.): Establishing background levels**[Contribution Number: 1201]**
C. Calasans, C. Carvalho, W. Primo, M. Cavalcante, C. Souza (Laboratório de Ciências Ambientais, Universidade Estadual do Norte Fluminense, Brazil), C. Castanheira (Prefeitura Municipal de Campos dos Goytacazes, Brazil)

I-7.
Total gaseous mercury (T.G.M.) in Champ/Drac, France from January 12, 2000 to January 24, 2000:

Correlation with other pollutant levels and meteorological parameters**[Contribution Number: 1202]**
C. Ferrari, A. Dommergue, A. Veysseyre, F. Planchon (Laboratoire de Glaciologie et Géophysique de l'environment du CNRS, France), C. Boutron (Laboratoire de Glaciology et Géophysique de l'environment du CNRS, France)

I-8.
Atmospheric mercury measurements in Guiyang, P. R. China**[Contribution Number: 1203]**
X. Feng, J. Sommar, O. Lindqvist (Department of Inorganic Chemistry, Göteborg University, Sweden), Y. Hong, Y. Zhu (State Key Laboratory of Environmental Geochemistry, Institute of Geochemistry, Chinese Academy of Sciences)

I-9
Inventory of Hg emission in Chongqing China today**[Contribution Number: 1204]**
C. Qing (Southwest Agricultural University, China) and S. Mu (UNMC, USA)

I-10.
Mercury absorbed by different plants in acid precipitation area in Chongqing**[Contribution Number: 1205]**
S. Mou (Southwest Agricultural University, China) and L. Mu (National Institute of Health, Maryland)

I-11.
Factors controlling short-term variability of total gaseous mercury distribution in urban air**[Contribution Number: 1206]**
K. Kim (Department of Earth Sciences, Sejong University/Sejong Institution, South Korea) and M. Kim (Seoul Metropolitan Institute of Environment and Health, South Korea)

I-12.
Study on the accumulation and transformation of atmospheric mercury in soil**[Contribution Number: 1207]**
D. Wang (College of Resources and Environment, Southwest Agricultural University, China)

I-13.
Rapid oxidation of mercury vapor in arctic air after polar sunrise**[Contribution Number: 1208]**
W.H. Schroeder, A. Steffen (Environment Canada, Meteorological Service of Canada, Ontario) and J. Lu (50 Milford Cr., Ontario, Canada)

I-14.
Comparison of different methods for sampling and determination of reactive gaseous mercury (RGM) in ambient air**[Contribution Number: 1208]**
R. Ebinghaus and E. Bahlmann (GKSS Research Center, Germany)

I-15.
Mercury contamination in river sediments from historical mining at New Idria and New Almaden, California**[Contribution Number: 1209]**
M.A. Thomas, C. Conaway, A.R. Flegal (Earth Sciences and Environmental Toxicology, UC Santa Cruz), M. Marvin-DiPasquale (USGS, California)

I-16.
Diel cycle of mercury emission from soil in the dark at constant temperature at ORNL: a mystery to be solved**[Contribution Number: 1210]**
H. Zhang, S. Lindberg (Environmental Sciences Division, Oak Ridge National Laboratory, Tennessee)

I-17.
The role of sedimentary organic carbon and nitrogen in mercury cycling in the Gulf of Trieste (Northern Adriatic Sea)**[Contribution Number: 1211]**
Nives Ogrinc (1), Milena Horvat (1), Stefano Covelli (2), Jadran Faganeli (3) and Vesna Fajon (1) (1. "J. Stefan" Institute, Dept. Environ. Sciences,Slovenia, 2. Dept. Geol., Environ. & Mar. Sci., University of Trieste, Italy, 3. Marine Biological Station, Slovenia)

Uptake and Effects

I-18.
Activity of tetracycline-mercury against resistant bacteria strains**[Contribution Number: 1212]**
L. Cursino, E. Chartone-Souza and A.M.A Nascimento (Department of General Biology, Institute of Biological Sciences, Federal University of Minas Gerais, Brazil)

I-19.
Heavy metal concentrations in seston of ten lentic systems from the northern of Rio Janeiro State: Parameterization with C, N, P and chlorophyll a**[Contribution Number: 1213]**
P. Pedrosa, R. Silva, C. Souza, M. Suzuki, C. Rezende (Universidade Estadual do Norte Flumenense, Laboratório de Ciências Ambientalis, Brazil)

I-20.
Trace metals in benthic diatoms from sediments – A case study of River Narmada, India**[Contribution Number: 1214]**
S. Bhand and K. Chaturvedi (School of Energy and Environmental Studies, Devi Ahilya University, India)

I-21.
Heavy metals in water and zooplankton of Novosibirsk reservoir**[Contribution Number: 1215]**
S. Dvurechenskaya, N. Yermolaeva (Institute for Water and Environmental Problems, Siberian Branch of Russian Academy of Sciences, Russia), G. Anoshin (United Institute of Geology, Siberian Branch of Russian Academy of Sciences, Russia)

I-22.
Bioaccumulation and mechanism of chromium uptake in mangrove, Rhizophora mucronata in Sepang Kecil River, Selangor, Malaysia**[Contribution Number: 1216]**
I. Mushrifah (School of Environmental Science and Natural Resources, University of Kebangsaan, Malaysia), P. Mangabeira (Brazil) and P. Galle (France)

I-23.
Sepetiba Bay – Contamination or pollution?**[Contribution Number: 1217]**
A. Campos, R. Moraes, A. Borges (Universidade Federal Fluminense, Brazil)

I-24.
Iron accumulation in Aedes aegypti larvae, food bolus and fecal pellets**[Contribution Number: 1218]**
P. Pedrosa, D. Gusmão, C. Rezende, F. Lemos (Universidade Estadual do Norte Flumenense, Brazil)

I-25.
Exposure of benthic animals to metal sources: clues from their irrigation behavior**[Contribution Number: 1219]**
C. Gallon, A. Tessier, L. Hare (INRS-Eau, Université du Québec, Canada)

I-26.
Analysis of metals in the Cachoeira Basin-Brazil: Concentrations in aquatic organisms**[Contribution Number: 1220]**
M.I.G. Severo (1), M. Oliveira (1,2), P. Mangabeira (1), P Galle (1), and R.B. Souza (1) (1. Department of Biological Sciences , University Santa Cruz, Brazil, 2. Department of Nuclear Engineering, Universidade Federal de Minas Gerais, Brazil)

I-27.
The distribution of some minor and major elements in the Sepia Officinalis shells as indicators for monitoring heavy metal water pollution**[Contribution Number: 1221]**
N. Geasa and K. Sharshar (Department of Zoology, Tanta University, Tanta, Egypt)

I-28.
Metal concentrations in Mytilus Edulis and Mya Arenaria living in and around tailings from an abandoned copper mine**[Contribution Number: 1222]**
G. Veinott, R. Anderson (Habitat and Toxicology Research Section, Northwest Atlantic Fisheries Centre, Department of Fisheries and Oceans, Newfoundland, Canada), P. Sylvester and G. Dewan (Department of Earth Sciences, Memorial University of Newfoundland, Newfoundland, Canada)

I-29.
Temporal and spatial variation of trace metals in Ostrea equestris and Perna perna along tree sites in the northern coast of Rio de Janeiro State, Brazil**[Contribution Number: 1223]**
A. Ferreira, A. Machado, I. Zalmon (Laboratório de Ciências Ambientais, Universidade Estadual do Norte Fluminense, Brazil)

I-30.
Heavy metal levels in biota from Todos os Santos Bay, Bahia State, Brazil**[Contribution Number: 1224]**
G. Amado-Filhol (1), C. Rezende (2), L. Salgado (1), M. Rebelo, J. Correa-Junior, W. Pfeiffer (3) (1. Programa Zona Costeira, Instituto de Pesquisas Jardim Botânico do Rio de Janeiro, Brazil, 2. Laboratório de Ciências Ambientais, 3. Laboratóóde Radioisótopos, Instituto de Biofísica)

I-31.
Trace metals in muscle tissue from Southern Brazilian coast fish**[Contribution Number: 1225]**
A. Carvalho, C. Reaende, A. Ferreira, V. Faria, M. Gomes, M. Cavalcante (Laboratório de Ciências Ambientais, Universidade Estadual do Norte Fluminense, Brazil)

I-32.
Heavy metals concentrations in fish from the lower portion of Paraiba do Sul River, RJ, Brazil**[Contribution Number: 1226]**
M. Totti (Laboratório de Estudo do Espaço Antrópico, Universidade Estadual do Norte Fluminense, Brazil), C. Souza and P. Pedrosa (Laboratório de Ciéncias Ambientais, Universidade Estadual do Norte Fluminese, Brazil)

I-33.
Fate of motorway pollutants through an aquatic ecosystem – transfer of heavy metals to aquatic life**[Contribution Number: 1227]**
K. Stead, M. Kerwick, and N. Ward (ICP-MS Facility, Department of Chemistry, University of Surrey, UK)

I-34.
Metals accumulation in sediments and whitefish of Kola Peninsula Lakes, Murmansk region, Russia**[Contribution Number: 1228]**
V. Dauvalter (Institute of the North Industrial Ecology Problems, Kola Science Centre, Russian Academy of Sciences) and T. Moiseenko (Institute of Water Problems, Russian Academy of Sciences)

I-35.
Heavy metal in food chains of the Barents Sea Ecosystem**[Contribution Number: 1229]**
G. Matishov, G. Ilyin, N. Golubeva (Murmansk Marine Biological Institute Kola Scientific Center, Russian Academy of Sciences, Russia)

I-36.
Cadmium and lead content in muscle tissue and liver of three fish species from the Eastern part of middle Adriatic**[Contribution Number: 1230]**
Z. Kljakovic Gaspic (Institute of Oceanography and Fisheries, Split, Croatia)

I-37.
Copper speciation in the gill of microenvironment of carp (Cyprinus carpio)**[Contribution Number: 1231]**
H. Tao, A. Long, J. Cao, F. Xu and C. Liu (Department of Urban and Environmental Studies, Peking University, China)

I-38.
Heavy metals concentrations in two species of marine mammals and their preys from the Northern coast of Rio de Janeiro State, Brazil**[Contribution Number: 1232]**
A. di Beneditto, R. Ramos, C. Souza, C. Carvalho, C. Rezende, (Laboratório de Ciências Ambientais, Universidade Estadual do Norte Fluminense,Brazil), O. Malm, H. Kerigh, M. Rebelo and F. Pinto (Laboratório de Radioisótopos EPF, IBCCF, UFRJ, Brazil)

I-39.
Trace metals distribution in tissues of Antarctic fur seals (Arctocephalus gazella) from Southern Shetland

Islands, Antarctica**[Contribution Number: 1233]**
S. Andrade, L. Ferrer & J. Marcovecchio (Instituto Argentino de Oceanografia, Argentina)

I-40.
Chemical behavior or Cu, Ni, and V in groundwater underneath a petrochemical complex**[Contribution Number: 1234]**
M. Sadiq (Department of Land Resources Science, University of Guelph, Canada) and I. Alarn (Deputy Mayer for Municipal Affairs, Jeddah Municipality, Saudi Arabia)

I-41.
System of environmental monitoring of heavy metals and environmental impact in Albania**[Contribution Number: 1235]**
H. Luka (Institute of Public Health, Tirana, Albania)

I-42.
Evidence for copper inhibition of algal growth in Saginaw Bay – Lake Huron, MI**[Contribution Number: 1236]**
T. Nosher, J. Lehman, and J. Nriagu (Departments of Environmental Health Sciences and Biology, University of Michigan)

I-43.
Cadmium and lead sources for benthic invertebrates inferred from in situ experiments**[Contribution Number: 1237]**
A. Tessier and L. Hare (INRS-Eau, Université du Québec, Canada)

I-44.
Effect of chronic exposure of cadmium on metabolic rate and biochemical constituents in an intertidal gastropod, Turbo Intercostalis**[Contribution Number: 1238]**
S.L. Pandeswara (Department of Zoology, Andhra University, India)

I-45.
Seasonal pattern of heavy metal levels in kidneys of roe deer (Capreolus capreolus), shot in some areas of Slovenia (Central Europe)**[Contribution Number: 1239]**
B. Pokorny and C. Ribaric-Lasnik (ERICo Velenje, Ecological Research and Industrial Cooperation, Slovenia)

I-46.
Absorption of thorium by Lemma gibba: A potential remediation approach for contaminated waters**[Contribution Number: 1240]**
W. Dong, J.T. Barber, A.T. Korz (Department of Ecology and Evolutionary Biology, Tulane University, Louisiana), A.W. Apblett (Department of Chemistry, Oklahoma State University), and E.H. Walker (Department of Chemistry, Southern University, Louisiana)

I-47.
Heavy metal (Cd, Cu, Pb, Cr, Zn, Hg) concentrations in tobacco of commonly smoked cigarette brands purchased in Germany, China, Russia, India and Canada**[Contribution Number: 1241]**
G. Muller, D. Eggersgluess and N.N. Raju (Institute of Environmental Geochemistry, Heidelberg University, Germany)

I-48.
Changes in the phytochelatin levels in the freshwater green alga Stigeoclonium Tenue exposed to heavy metal mixture at different pHs, bicarbonate and suspended matter content**[Contribution Number: 1242]**
B. Pawlik-Skowronska (Institute of Ecology, P.A.S., Experimental Station, Poland)

I-49.
Algal phytochelatins as indicator of cadmium bioavailability in aquatic environment**[Contribution Number: 1243]**
T. Skowronksi and J. Pirszel (Institute of Ecology, P.A.S., Experimental Station, Poland)

I-50.
Heavy metal content in the fish of the Ob River**[Contribution Number: 1244]**
P.A. Povov and N.A. Popov (Institute of Water and Ecological Problems, Siberian Branch of the Russian Academy of Sciences, Russia)

I-51.
Lead in the environment and children's health in Russian cities**[Contribution Number: 1245]**
B. Revich, Institute for Forecasting, Russian Academy of Sciences

Soil/Plant/Forest Ecosystems

I-52.
The possible relationship between litter decomposition rates and metal accumulation in the forest floor of maple woods along an urban rural corridor in S.Ontario**[Contribution Number: 1246]**
T. Hutchinson and E. Sager (Environmental and Resources Studies Program, Trent University, Canada)

I-53.
Impacts of heavy metal enriched biosolids on nitrogen mineralization in two Georgia soils**[Contribution Number: 1247]**
S. Cela and M. Sumner (Department of Crop and Soil Sciences, University of Georgia)

I-54.
Influence of precipitation chemistry of heavy metal concentrations in soil water**[Contribution Number: 1248]**
T. Sjobakk, E. Steinnes (Department of Chemistry, Norwegian University of Science and Technology), I. Berg, D. Aamlid (Norwegian Forest Research Institute)

I-55.
Heavy metals and seed germination in some medicinal and aromatic plants**[Contribution Number: 1249]**
E. A. Jeliazkova and L. Craker (Department of Plant and Soil Sciences, University of Massachusetts)

I-56.
Influence of heavy metals on N-metabolism, stress-related biomarkers and product quality in food plants**[Contribution Number: 1250]**
H. Bergmann, B. Machelett, B. Lippmann (Institute of Nutrition Science, University of Jena, Germany)

I-57.
Absorption and accumulation of Cd, Pb, Cu, Mn and Zn in Nepeta transcaucasica Grosch. as a function of distance from a polluted zone**[Contribution Number: 1251]**
V. Zheljazkov (Jeliazkov) and P. Warman (Department of Environmental Sciences, Nova Scotia Agricultural College, Canada)

I-58.
Evaluation of heavy metals in soils and vegetation from an Atlantic forest in the north of Rio de Janeiro State, Brazil**[Contribution Number: 1252]**
D. Villela, C. Souza, M. Nascimento, L. de Aragão, C. Calasans, L. Guedes, R. Souza (Laboratório de Ciências Ambientais, Universidade Estadual do Norte Fluminense, Brazil)

I-59.
Heavy metals distribution in burnt soils from a rain forest area in Roraima, Brazil**[Contribution Number: 1253]**
M. Nascimento, C. Souza, D. José, L. Aragon, D. Villela, C. Rezende, M. Aldeida (Laboratório de Ciências Ambientais, Universidade Estadual do Norte Fluminense, Brazil)

I-60.
The distribution of heavy metals in agricultural soils from a rural area in Rio de Janeiro State, Brazil**[Contribution Number: 1254]**

C. Dias, C. Souza (Laboratório de Ciências Ambientais, Universidade Estadual do Norte Fluminense, Brazil), P. Monnerat (Laboratório de Fitotecnia, Universidade Estadual do Norte Fluminense, Brazil)

I-61.
The role of humus acids in the processes of dispersion and accumulation of heavy metals in natural waters, soils and carbonaceous rocks**[Contribution Number: 1255]**
G. Varshal, T. Velyukhanova, S. Khushvakhtova, I. Koshcheeva, O. Tyutyunnik (Vernadsky Institute of Geochemistry and Analytical Chemistry, Russian Academy of Sciences, Russia), Yuriy Kholin (Chemical Faculty, Kharkov State University, Ukraine)

I-62.
Reducing the heavy metals toxicity in sludge amended soil using VA mycorrhizae**[Contribution Number: 1256]**
R.A. Abdel-Aziz*; S.M.A. Radwan* and M.S. Dahdoh** (* Agricultural Microbiology Dept., National Research Center, Cairo, Egypt,
**Soil Science and Microbiology Dept., Desert Research Center, Cairo, Egypt)

I-63.
Heavy metal distribution in soil profiles of a dumping area: A case study in the Campos dos Goytacazes municipality, Rio de Janeiro, Brazil**[Contribution Number: 1257]**
C. Rezende (Universidade Estadual do norte Flumenense, Brazil)

I-64.
The ecological estimation of forestparks with the object of the content of heavy metal element in soil-plant system**[Contribution Number: 1258]**
L. Bortnik (Institute for Soil Science and Agrochemistry Research, Ukraine)

I-65.
The role of catchment as a methylmercury source to lakes**[Contribution Number: 1259]**
P. Porvari and M. Verta (Finnish Environment Institute, Finland)

I-66.
Bioavailability of heavy metals added to two Malaysian soils**[Contribution Number: 1260]**
A.A. Saad, A.K. Arof, and A.H. Yahya (University of Malaysia)

I-67.
Cadmium and lead in agricultural souls of Santiago Ixcuintla Nayarit, Mexico**[Contribution Number: 1261]**
V. Ibarra, R. Gomez, R.M. Arriaga (Dirección de Investigación Científica, Facultad de Agricultura, Universidad Autónoma de Nayarit, México)

I-68.
Accumulation and Distribution of Chromium in the Tomato Plants: Studies using SIMS and Electro Probe X-Ray Microanalysis**[Contribution Number: 1262]**
P. Mangabeira (1), I. Mushrifah (2), F. Escaig (1), A-A.F. Almeida (1), D. Laffray (3), M.I.M. Severo (1), A.H. Oliveira (1), and P. Galle (1), (1. Department of Biology, University of Santa Cruz, Brazil, 2. Department of Botany, Faculty of Life Sciences, University of Kebangsaan Malaysia, 3. Laboratoire de Biophysique Végétale, Faculté de Science, Université Paris XII, France)

Metals in the Urban Environment

I-69.
Environmental geochemistry of Moscow metropolitan area**[Contribution Number: 1263]**
A. Golovin, N. Moskalenko, L. Sokolov (Project Geoecology and Geochemical Mapping of Russia, Institute of Mineralogy, Russia)

I-70.
Drainage and discharge of salt in urban stormwaters: a potential hazard for increased heavy metal pollution

of the environment**[Contribution Number: 1264]**
M. Watts, R. Hares, V. Zettel, K. Stead and N. Ward (ICP-MS Facility, Department of Chemistry, University of Surrey, UK)

I-71.
Evaluation of heavy metal emission and transfer from road and traffic sources**[Contribution Number: 1265]**
M. Legret and C. Pagotto (Laboratoire Central des Ponts et Chaussées, France)

I-72.
Heavy metal movement in sewage irrigated soil**[Contribution Number: 1266]**
P. Maity, D. Chatterjee (Department of Chemistry, University of Kalyani, India), A. Gangopadhyay (Dept. of Civil Engineering, Jadavpur University, India)

I-73.
Uptake of heavy metals by forage crops from sludge amended soils**[Contribution Number: 1267]**
M. Noll, N. Perry (Department of the Earth Sciences, State University of New York College at Brockport) and M. Delobbe (Genie de l'environment, Institut Universitaire de Technologie Louis Pasteur, France)

I-74.
Increased extractable metal concentrations following sewage sludge additions to grassland soils**[Contribution Number: 1268]**
J. Bacon, M. Coull, I. Hewittm, P. Cooper (Macaulay Land Use Research Institute, UK)

I-75.
Suspended particulate and heavy metals in Cairo air**[Contribution Number: 1269]**
M. Nasralla and E. Ali (Air Pollution Department, National Research Center, Cairo, Egypt)

I-76.
Lead and Status of other Elements in Calcutta's Environment: A five-year Study**[Contribution Number: 1270]**
A. Chatterjee (National Institute for Environmental Studies, Environmental Chemistry Division, Japan)

I-77.
The depositional fluxes of Pb-210, Po-210 and Be-7 in Detroit, Michigan**[Contribution Number: 1271]**
D. McNeary and M. Baskaran (Department of Geology, Wayne State University, Michigan)

I-78.
Seasonal variations in the chemical speciation of copper along the Huron River**[Contribution Number: 1272]**
A. Mansilla-Rivera and J. Nriagu (School of Public Health, University of Michigan)

I-79.
The phasing out of leaded petrol and changes to the 206Pb/207Pb of atmospheric lead in Scotland**[Contribution Number: 1273]**
J. Farmer, L. Eades, M. Graham (Department of Chemistry, University of Edinburgh, Scotland) and J. Bacon (Soil Science Group, Macaulay Land Use Research Institute, Scotland)

POSTER SESSION II
15:50 Tuesday (August 8) and 10:30 Wednesday (August 9)
Location: Alumni Center, University of Michigan

Ecosystem Remediation

II-1.
Heavy metal mobilization with use of Aspergillus Species**[Contribution Number: 1274]**
D. Sári and L. Vermes (St. István University, Hungary)

II-2.
Environmental heavy metal quality regulations: how useful are they for understanding and regulating environmental problems?**[Contribution Number: 1275]**
N. Ward (ICP-MS Facility, Department of Chemistry, University of Surrey, UK)

II-3.

II-4.
Effect of flow rate on the retention of three heavy metals (Zn, Cd, and Pb) in a fluvio-glacial deposit column**[Contribution Number: 1276]**
L. Fevrier, T. Winiarski, C. Delolme (Laboratoire des Sciences de l'Environnement, ENTPE, France) and J. Gaudet (Laboratoire d'etude des Transferts en Hydrologie et Environnement, France)

II-5.
Minimize arsenic mobility in contaminated soil as a natural attenuation approach**[Contribution Number: 1277]**
F. Dankwarth, J. Gerth and U. Forstner (Technische Universitat Hamburg-Harburg, Germany)

II-6.
From waste to resource: The potential application of sugar bagasse in remediation of actinides**[Contribution Number: 1278]**
W. Dong, J.T. Barber (Dept. of Ecology and Evolutionary Biology, Tulane University, Louisiana), A.W. Apblett (Dept. of Chemistry, Oklahoma State University) and Steve Lindberg (Oak Ridge Associated Universities, Tennessee)

II-7.
Evaluation of Lead Remediated Soils by means of Different Availability Indices**[Contribution Number: 1279]**
Wouter Geebelen (Environmental Biology, Centre for Environmental Sciences, LUC, Universitaire Campus, Belgium), Domy C. Adriano (Savannah River Ecology Laboratory, University of Georgia), Jaco Vangronsveld and Herman Clijsters (Environmental Biology, Centre for Environmental Sciences, LUC, Universitaire Campus, Belgium)

Mercury in the Environment

II-8.
Atmospheric mercury emissions from municipal solid waste landfills**[Contribution Number: 1280]**
S. Lindberg, H. Zhang and G. Southworth (Environmental Sciences Division, Oak Ridge National Laboratory, Tennessee), D. Reinhart (University of Central Florida), P. McCreanor (Mercer University), D. Wallschlager (Frontier Geosciences), J. Price (Florida Department of Environmnetal Protection)

II-9.
Transport and deposition of mercury from mercury mine effluent, tailings and wastes in watersheds developed within serpentinite bedrock, New Idria, California**[Contribution Number: 1281]**
J. Rytuba, W. Miller, J. Crock (US Geological Survey, California), C. Kim (Stanford University, California)

II-10.
Hydrological control on the temporal variability of mercury in surface waters of the upper Madeira Basin Rivers, Bolivia**[Contribution Number: 1282]**
B. Maurice-Bourgoin, P. Fraizy (IRD, Bolivia), L. Alanoca (UMSA-IIQ, Bolivia), and J. Guyot (IRD-UMR LMTG, Universite Paul Sabatier, France)

II-11.
Effect of water intrusion on Hg-mobilization in coastal aquifers: the case of Monte Argentario (Italy)
[Contribution Number: 1283]
A. Adorni-Braccesi (Institute of Geocronologia e Geochimica Isotopica, CNE, Italy), P. Sciuto (Dept. di Scienze della Terra, Universita di Siena, Italy), R. Caboi, R. Cido, A. Cristini, L. Fanfani, L. Rundeddu, P. Zuddas (Dept. di Scienze della Terra, Universita di Cagliari, Italy)

II-12.
Mercury ecogeochemistry-A prediction base of mercury hazard caused by natural resources processing**[Contribution Number: 1284]**
N. Ozerova (Institute of Geology of Ore Deposits, Russian Academy of Sciences, Russia), N. Mashyanov (Earth's Crust Institute, St. Petersburg State University, Russia)

II-13.
Human intervention in the mercury cycle: the role of consumer products**[Contribution Number: 1285]**
B. Lourie (1216 Yonge St., Suite 201, Toronto, ON, Canada)

II-14.
Mercury pollution in the Amazon Basin- Brazil. Mercury contents of scalp hair and health effects**[Contribution Number: 1286]**
M. Harada (1), J. Nakanishi (2), E. Yasoda (2), M. Pinherio (3), T. Oilawa (3), G. Guimaraes (3), B. Gardoso (1. Department of Social Welfare Studies, Gakuen University, Japan, 2. Institute of Environmental Science and Technology, Yokohama National University, Japan, 3. Nucleo de Medicina Tropical, Universidade Federal do Para, Brazil)

II-15.
Factors affecting mercury exposure among women of reproductive age group (16-60 years) in the three barangays of Puerto Princesa City**[Contribution Number: 1287]**
T. Mendoza (Department of Health, Non-Communicable Disease Control Service, Occupational Health Division, Philippines)

II-16.
A field dose-response approach as a tool for environmental Hg contamination assessment. Case study: Bioaccumulation of Hg by Tucunaré (Cichla Sp.) from Brazilian Amazon ecosystems**[Contribution Number: 1288]**
Z. Castilhos (Center for Mineral Technology, Ilha do Fundão, Brazil), E. Bidone (Department of Geochemistry, Fluminense Federal University, Brazil)

II-17.
Mercury levels in carnivorous fishes of the Madeira River Basin, Rondônia, Brazil**[Contribution Number: 1289]**
P. Gali (1), E. Silveira (1), W. Bastos (1), M. Vergotti, J. Torres, (2), (1. Environmental Geochemical Laboratory, Geography Department, Federal University of the Rondônia, Brazil, 2. Radioisotopes Laboratory, Federal University of the Rio de Janeiro, Brazil)

II-18.
Mercury concentrations in fish of the Negro River-Basin, Amazon Brazil**[Contribution Number: 1290]**
A. Barbosa, J. Souza, I. Ferrari, J. Dorea, F. Barreto (Instituo de Química, Universidade de Brasilia, Brazil)

II-19.
Mercury levels in tissues of otters from Ontario, Canada: Variation with age, sex, and location**[Contribution Number: 1291]**
G. Mierle (Dorset Environmental Science Centre, Ontario Ministry of the Environment, Canada), E. Addison, K. MacDonald, D. Joachim (Tret University Science Complex, Ontario Ministry of Natural Resources, Canada)

II-20.
Behavior of the mercury in the physical environment in Baixada Cuiabana**[Contribution Number: 1292]**
L. Oliveira, S. Castro, P. Barros (Pós Graduação em Saúde Ambiente, Brazil)

II-21.
Meteorological aspects of environmental mercury monitoring with atomic absorption analyzer**[Contribution Number: 1293]**
A. Antipov, E. Genina, A. Golovatskii (Institute for Optical Monitoring, Siberian Branch of the Russian Academy of Sciences, Russia), V. A. Sapozhnikova (Institute of Atmospheric Optics, Siberian Branch of the Russian Academy of Sciences, Russia)

II-22.
Potential changes to the mercury hazardous waster treatment standards**[Contribution Number: 1294]**
H.J. Austin, R. Chow, M. Cunningham, J. Lewis (Office of Solid Sate, US EPA)

II-23.
Estimation of mercury and other heavy metals contamination in traditional gold-mining areas of Siberia**[Contribution Number: 1295]**
T. Laperdina, M. Melnikova, T. Khvostova (Chita Institute of Natural Resources, Siberian Branch, Russian Academy of Sciences, Russia)

II-24.
Spatio-temperal variability of mercury content in hydrocarbon gas deposits**[Contribution Number: 1296]**
N. Mashyanov, V. Ryshov (Earth's Crust Institute, St. Petersburg State University, Russia), N. Ozerova (Institute of Geology, Ore Deposits, Petrology, Mineralogy and Geochemistry, Russian Academy of Sciences, Russia)

II-25.
Duration of post-impoundment increases in fish mercury levels at the La Grande Hydroelectric Complex, Québec, Canada**[Contribution Number: 1297]**
R. Schetagne (Hydraulics and Environment Department, Hydro-Québec, Canada)

II-26.
Mercury pollution in the Amazon Sasin Brazil – Mercury contents of scalp hair and health**[Contribution Number: 1298]**
H. Masazumi (Department of Social Welfare Studies, Kumamolo Gakuen University, Japan)

II-27.
Mercury and carbon distribution in surface soils from two distinct altitudes in a tropical rain forest in the North of Rio de Janeiro State, S. E. Brazil**[Contribution Number: 1299]**
W. Primo, C. Carvalho, D. Vilella, and A. Mazurec (Laboratorio de Ciencias Ambientais, CBB, UENF, Brazil)

II-28.
Mercury and methylmercury relationships in contaminated streams in the southeastern USA**[Contribution Number: 1300]**
G. Southworth, M. Bogle (Oak Ridge National Laboratory, Oak Ridge, Tennessee) and R. Turner (RT Geosciences Inc., British Columbia, Canada)

Archives in Bogs and Wetlands

II-29.
Long term natural lake acidification and heavy metal mobilization by weathering of volcanic ashes – A case study of lacustrine lakes in sediments of southernmost Patagonia, Chile**[Contribution Number: 1301]**
R. Kilian (Institute of Geology, University of Freiburg, Germany) and H. Biester (Institute of Environmnetal Geochemistry, University of Heidelberg, Germany)

II-30.
Mercury profiles in Caçó Lake: remote lake in Maranhão State, NE Brazil**[Contribution Number: 1302]**
B. Moraes (Department of Geoquímica, Universidade Federal Fluminense, Brazil)

II-31.
Retrospective study of the extent of heavy metal by lichen biomonitors employing nuclear technique in China**[Contribution Number: 1303]**
Z. Zhang, X. Mao, Z. Chai (Laboratory of Nuclear Analytical Techniques, Institute of High Energy Physics, Chinese Academy of Sciences, China)

II-32.
Determination of current and historic loads of atmospheric deposition in the Czech Republic using analyses

of moss and forest floor humus**[Contribution Number: 1304]**
J. Sucharová and I. Suchara (Research Institute of Ornamental Gardening, Czech Republic)

II-33.
Evaluation of heavy metal accumulation during the last century in a freshwater system at the north region of the Rio de Janeiro State, Brazil**[Contribution Number: 1305]**
M. da Silva and C. Rezende (Universidade Estadual do Norte Fluminense, Laboratório de Ciências Ambientais, Brazil)

II-34.
Elemental composition of peat, pool and porewaters of 15 peatlands**[Contribution Number: 1306]**
L. Bendell-Young (Department of Biological Sciences, Simon Fraser University, British Columbia, Canada)

II-35.
Investigations of the potential mobility of heavy metals in an ombrotrophic peat bog**[Contribution Number: 1307]**
A. Freeman, M. Graham, J. Farmer (Department of Chemistry, University of Edinburgh, Scotland) and D. Lumsdon (Macaulay Land Use Research Institute, Scotland)

II-36.
Increased mercury concentrations during the younger dryas recorded in an ombrotrophic peat bog**[Contribution Number: 1308]**
F. Roos and W. Shotyk (Geological Institute, University of Berne, Switzerland)

II-37.
Copper in peat from hummocks and hollows and feather moss near the Horne smelter, Rouyn-Noranda, Quebec, Canada**[Contribution Number: 1309]**
I. Kettles (Geological Survey of Canada, Canada)

II-38.
Enrichment of Cu, Ni, Zn, Pb, and As in an ombrotrophic peat Bog near a Cu-Ni smelter in SW Finland**[Contribution Number: 1310]**
T. Nieminen (Finnish Forest Research Institute, Finland), W. Shotyk (Geological Institute, University of Berne, Switzerland)

II-39.
Mercury accumulation and its control by climate in the ombrotrophic peat Bog of Penido Vello (PVO) (NW SPAIN)**[Contribution Number: 1311]**
A. Cortizas, E. Garcia-Rodeja, X. Pombal, J. Munoz (Department of Edafología y Química Agrícola, Universidad de Santiago, Spain)

II-40.
Lithogenic elements recorded at the Pena Da Cadela (PDC) ombrotrophic peat Bog (NW Spain) as indicators of past soil erosion episodes**[Contribution Number: 1312]**
A. Cortizas, T. Rodriguez, E. Garcia-Rodeja, X. Pombal, J. Munoz, (Department of Edafología y Química Agrícola, Universidad de Santiago, Spain)

II-41.
Development of an analytical protocol for the determination of mercury concentrations in solid peat samples: effects of sample preparation**[Contribution Number: 1313]**
F. Roos (Geological Institute, University of Berne, Switzerland), H. Biester (Institute of Environmental Geochemistry, University of Heidelberg, Germany), M. Goodsite (Department of Chemistry, Odense University, Denmark), A. Martinez-Cortizas (Department of Soil Science, University of Santiago di Compostela, Santiago, Spain), W. Shotyk (Geological Institute, University of Berne, Switzerland)

II-42.
Modeling the fate of atmospherically deposited heavy metals in a catchment/lake system using contrasting records from the lake and an adjacent peat Bog**[Contribution Number: 1314]**

B. Short, P. Appleby (Department of Mathematical Sciences, University of Liverpool, UK), J. Hilton (Institute of Freshwater Ecology, River Laboratory, UK)

II-43.
The chronology of anthropogenic, atmospheric Pb deposition recorded by cores by three minerogenic peatlands from Switzerland**[Contribution Number: 1315]**
W. Shotyk (Geological Institute, University of Berne, Baltzerstrasse 1, CH-3012 Berne, Switzerland)

II-44.
Long term records of heavy metals and radioactivity in Canadian arctic air**[Contribution Number: 1316]**
C. Li, J. Cornett, R. Hughes (Trent University, Ontario, Canada), K. Ungar (RPB, Health Canada, Ontario, Canada), J. Lam (INMS, National Research Council, Ontario, Canada)

II-45.
Metal pollution history of the Golden Horn sediments (1912-1987)**[Contribution Number: 1317]**
G. Tuncer, G. Tuncel, T. Balkas (Middle East Technical University, Department of Environmental Engineering, Turkey)

Alpine and Polar Ecosystems

II-46.
Dissolved zinc and iron levels in seawater from potter cove, 25 De Mayo Island, Antarctica**[Contribution Number: 1318]**
S. Andrade and J. Marcovecchio (Institute Argentino de Oceanografia, Argentina)

II-47.
Assessment of toxicity of heavy metals accumulated in lake sediments**[Contribution Number: 1319]**
V.A. Dauvalter (Institute of the North Industrial Ecology Problems, Kola Science Centre, Russian Academy of Sciences)

II-48.
Impact assessment of a recent road opening as recorded in nearby lacustrine sediments: local versus regional heavy meal pollution**[Contribution Number: 1320]**
S. Aries and M Polve (Laboratoire des Mécanismes de Transfert en Géologie, France)

II-49.
Environmental justice: A case study of community directed assessment of mercury in fish in Alaska**[Contribution Number: 1321]**
L. Duffy, T. Rodgers, S. Paul (Institute of Artic Biology and Department of Chemistry and Biochemistry, University of Alaska)

II-50.
Residence time of Arctic haze aerosols using short-lived radionuclides**[Contribution Number: 1322]**
M. Baskaran (Department of Geology, Wayne State University, Michigan) and G.E. Shaw (Geophysical Research Institute, University of Alaska)

Sediments and Water

II-51.
The content, form and regional geochemical characteristics of heavy metals on the Changjiang (Yangtze) River system**[Contribution Number: 1323]**
Z. Licheng and W. Chaoyang (Institute of Geography, Chinese Academy of Sciences)

II-52.
History of trace metal discharge in the Piracicaba River Basin (São Paulo State, Brazil)**[Contribution Number: 1324]**

A. Fostier (Instituto de Química/UNICAMP, Brazil), J. Godoy (Deparmento de Quimica/PUC, Brazil), M. Falótica, S. E. Ferraz, R. Victoria (Laboratório de Ecologia Isotópica, CENA/USP, Brazil)

II-53.
Longitudinal Distribution of Heavy Metals in Sediments of Piave River Estuary (Northeastern Italy)
[Contribution Number: 1325]
F. Collavini, R. Zonta and L. Zaggia (National Research Council, Italy)

II-54.
Heavy metal contamination in industrially impacted sediments**[Contribution Number: 1326]**
S. Bhand and K. Chaturvedi (School of Energy and Environmental Studies, University of Indore, India)

II-55.
Heavy metals on fluvial sediments from a tobacco plantation in the South of Brazil**[Contribution Number: 1327]**
J. Torres (1), R. Lima (2), V. Etges (2), S. Turci (3), M. Ferreira (2), N. Hermes (2), O. Malm (1) (1. Laboratorio de Radioisotopos Eduardo Penna Franca, Instituto de Biofisica Carlos Chagas Filho, UFRJ, Brazil, 2. Curso de Mestrado em Desenvolvímento Regional, UNISC, Brazil, 3. COMPREV, INCA, Brazil)

II-56.
Stability and fate of heavy metals in anoxic marine sediments**[Contribution Number: 1328]**
B. Totterdell and D. Parry (Faculty of Science, Information Technology and Education, Northern Territory University, Australia)

II-57.
Thallium speciation in the Third Sister Lake, Michigan**[Contribution Number: 1329]**
T. Lin (Department of Environmnetal Engineering and Health, Yuanpei Technical College, Hsih-Chu, Taiwan 300), J. Nriagu and I. Mansilla-Rivera (Department of Environmental Health Sciences, School of Public Health, University of Michigan)

II-58.
Assessment of exposure to heavy metals on adult population in Mumbai, India**[Contribution Number: 1330]**
R. Triphtyi, R. Raghunath, V. Sastry, and S. Sadasivan (Environmental Assessment Division, Bhabha Atomic Research Centre, India)

II-59.
Chronology of anthropogenic heavy metals and PAHs in Lake Constance sediments: back to the background!
[Contribution Number: 1331]
G. Mueller (Institute of Environmental Geochemistry, University of Heidelberg, Germany)

Health Effects of Metals

II-60.
Tooth enamel biomarker for heavy metal exposure assessment**[Contribution Number: 1332]**
J. Ericson, A. Rinderknect (Department of Environmental Analysis & Design, University of California, Irvine), M. Kleinman (Department of Community & Environmental Medicine, University of California, Irvine)

II-61.
Peculiarities of metabolism of trace elements dependent on the ecology and arterial hypertension in nomadic shepherds of Central Asia**[Contribution Number: 1333]**
I. Stoox, G. Kashkan, L. Agulova, N. Yuneman (Department of Arterial Hypertension, Institute of Cardiology, Russian Department of General and Inorganic Chemistry, Polytechnic University of Tomsk, Russia)

II-62.
Heavy metal concentrations in the urine of pupils as a indicator for environmental quality**[Contribution**

Number: 1334]
Pichler-Semmelrock (Environmental Protection Center for Syria, Institute for Chemistry, Karl-Franzens University, Austria)

II-63.
Manganese is toxic to rat striatal neurons in primary culture**[Contribution Number: 1335]**
E. Malecki and J. Connor (Dept. of Neuroscience and Anatomy, Penn State College of Medicine)

II-64.
Lead poisoning in silver refiners and its prevention**[Contribution Number: 1336]**
S.K. Tandon, A. Bhargava and V. Shukla (Industrial Toxicology Research Center, India)

II-65.
Arsenic transformation and transport study in contaminated region of the gold recovery plant**[Contribution Number: 1337]**
O. Shuvaeva (Institute of Inorganic Chemistry, Siberian Branch of Russian Academy of Sciences)

II-66.
Arsenic in groundwater systems of New Hampshire**[Contribution Number: 1338]**
S. Peters and J. Blum (Department of Geological Sciences, University of Michigan)

II-67.
The role of carbonate ion in dissolution of arsenic from aquifer material**[Contribution Number: 1339]**
M. Kim and J. Nriagu (Department of Environmental Health Sciences, University of Michigan), and S. Haack (Water Resources Division, U.S. Geological Survey, Michigan)

II-68.
Arsenic carbonate complexes in groundwater**[Contribution Number: 1340]**
J.S. Lee and J. Nriagu (Dept. of Environmental Health Sciences, School of Public Health, University of Michigan)

II-69.
Is there a relation between selenium in blood and subjective symptoms self-related to dental amalgam?
[Contribution Number: 1341]
P. Höl (Department of Odontology, University of Bergen, Norway)

II-70.
Effects of selenium on the response in lead and cadmium exposure: experimental studies**[Contribution Number: 1342]**
D. Surcel (Department of Occupational Medicine, Institute of Public Health, Romania)

II-71.
Action of extract of parsley (Petroselinum sativum) in the mercury detoxification in vitro**[Contribution Number: 1343]**
L. Cursino, E. Chartone-Souza and A.M.A. Nascimento (Department of General Biology, Institute of Biological Sciences, Federal University of Minas Gerais, Brazil)

II-72.
Differences in UK sheep breeds in copper, zinc and molybdenum metabolism and the relationship of the breed's origin to the chemistry of the area**[Contribution Number: 1344]**
T. Hutchinson and M. Symington (Environmental and Resources Studies Program, Trent University, Canada)

II-73.
Neurobehavioral and social parameters in Slovak children with environmental exposure to low-level of lead**[Contribution Number: 1345]**
E. Sovcikova (Institute of Preventive and Clinical Medicine, Slovak Republic)

II-74.
Ceiling dust: A potential urban environmental problem**[Contribution Number: 1346]**

J. Davis and B. Gulson (Graduate School of the Environment, Macquarie University, Australia)

II-75.
Mobilization of lead-field measurements at a trap range compared to solubility experiments**[Contribution Number: 1347]**
M. Bäckström, S. Karlsson and B. Allard (Man-Technology-Environment Research Centre, Örebro University, Sweden)

II-76.
Cloning and functional analysis of the PBR lead resistance determination of Ralstonia eutropha CH34**[Contribution Number: 1348]**
Borremans (Vlaamse Instelling voor Technologisch Onderzoek, Belgium)

II-77.
Use of geostatistical algorithms to model uncertainty in soil lead concentrations at skeet and trap ranges**[Contribution Number: 1349]**
W. Thayer (Environmental and Resources Engineering SUNY-ESF, New York)

II-78.
Sources of lead in blood from Bangalore (India) female adults using stable lead isotopes- A pilot study**[Contribution Number: 1350]**
B. Gulson (1, 2), T. Venkatesh (3), J. Palmer (2), H. D'Souza (3) (1. Graduate School of the Environ-ment, Macquarie University, Australia, 2. CRISO Division of Exploration and Mining,, Australia, 3. Department of Biochemistry and Biophysics, St. John's Medical College, India)

II-79.
Ambient atmospheric lead concentrations and high blood lead concentrations in Malta**[Contribution Number: 1351]**
J. Sacco (Department of Pharmacy, University of Malta)

II-80.
Heavy metals in the drinking water of Madurai district**[Contribution Number: 1352]**
P. Navaraj (Yadava College, India)

II-81.
Concentration of lead in Cairo atmospheric after using unleaded gasoline**[Contribution Number: 1353]**
H. Rizk and M. Khoder (National Research Centre, Air Pollution Department, Dokki, Cairo, Egypt)

II-82.
Biological indicators of cadmium nephrotoxicity**[Contribution Number: 1354]**
Ibrahim and F. Metwally (National Research Centre, Air Pollution Department, Dokki, Cairo, Egypt)

II-83.
Contamination and leaching behavior of heavy metals in sediments from urban gully pot alongside some main roads in Seoul City, Korea**[Contribution Number: 1355]**
P. Lee (Environmental Geochemistry Division, Korea Institute of Geology, Mining & Materials, Taejon, South Korea), S. Yun (Department of Earth & Environmental Sciences, Korea University, Korea), S. Choi (Department of Earth and Environmental Sciences, Chungbuk University, Korea)

II-84.
Dose effect and dose response relationships of some biological activities in Zinc workers**[Contribution Number: 1356]**
N. Badawy (1), M. Salam (2), S. Eissa (3), R. Hassan (3), and E. Sayed (1. Department of Industrial Medicine and Occupational Health in National Research Center, Dokki, Egypt, 2 Department of Human Heridetary in Dokki, Egypt, 3 Department of Industrial Medicine, Medical Cairo University, Egypt)

II-85.
The use of cement kiln dust to control lead absorption by plant from polluted soil, A case study**[Contribution Number: 1357]**

M. Nasralla (1), Ali (2), I. Aziz (3), (1. Air Pollution Department, 2. Ecophysiology Department, 3. Research Assistant of National Research Centre, Egypt)

II-86.
Lead associated health hazards and its immunotoxic effects among plumbers**[Contribution Number: 1358]**
A.M.K. El-Safty (Dept of Industrial Medicine and Occupational Diseases, Faculty of Med., Cairo University), F. Metwally (Department of Industrial medicine, National Research Center, Egypt)

II-87.
Antioxidative protection against injury caused by heavy metals**[Contribution Number: 1359]**
S.V.S Rana (Department of Zoology, Ch Charan Singh University, Meerut, India)

II-88.
Oral chelation and nutritional replacement therapy for mercury heavy metal toxicity - Part 1**[Contribution Number: 1360]**
Oral chelation and nutritional replacement therapy for mercury heavy metal toxicity - Part 2**[Contribution Number: 1361]**
Oral chelation and nutritional replacement therapy for mercury heavy metal toxicity - Part 3**[Contribution Number: 1362]**
M. Pouls (Extended Health, California)

POSTER SESSION III
15:50 Wednesday (August 9) and 10:30 Thursday (August 10)
Location: Alumni Center, University of Michigan

Analytical

III-1.
Heavy metal (Cd, Cu, Pb and Zn) determination in woodlouse (Oniscus asellus)**[Contribution Number: 1363]**
F. Tack, N. Bogaert, M. Verloo (Chemistry and Applied Ecochemistry, Ghent University, Belgium), F. Hendrickx, M. Jean-pierre, J. Mertens (Laboratory of Animal Ecology, Ghent University, Belgium)

III-2.
Leachability of heavy metals in roadside dust and soil by NEB-ICP-MS**[Contribution Number: 1364]**
N. Ward, K. Stead, R. Hares (ICP-MS Facility, Department of Chemistry, University of Surrey, UK)

III-3.
Simultaneous cathodic and anodic voltammetric determination of As(III) and Se(IV) and Cu(II)-Pb(II)-Cd(II)-Zn(II)-Mn(II) in environmental matrices: water, algae and fish**[Contribution Number: 1365]**
C. Locatelli and G. Torsi (Department of Chemistry “G. Ciamician”, University of Bologna, Italy)

III-4.
Sequential extractions, fractionation studies – what are they defining?**[Contribution Number: 1366]**
K. Stead, R. Hares and N. Ward (ICP-MS Facility, Department of Chemistry, University of Surrey, Guildford, UK)

III-5.
Microwave-assisted digestion of mercury polluted soils**[Contribution Number: 1367]**

T. Lifvergren, P. Suer (Man-Technology-Environment Research Centre, Örebro University, Sweden) and U. Vievegg (SAKAB, Sweden)

III-6.
Plasma source mass spectrometry (ICP-MS) application to multi-element analysis in sediment and water samples**[Contribution Number: 1368]**
A. H. Oliveira (1), M.I.G. Severo (2), M.A.R.V. Veado (1), P. Mangabeira (2), P. Galle (2), G.G. Severo (1) and R.B. Souza (2) (1. Dept. of Nuclear Engineering, Universidade Federal de Minas Gerais, Brazil, 2. Department of Sciences Biological- University Santa Cruz, Brazil)

III-7.
Sampling error: the neglected component of measurement uncertainty in trace element analysis**[Contribution Number: 1369]**
S. Squire (1), M. Ramsey (2), M. Gardner (3), (1. Environmental Toxicology, University of California, Santa Cruz, CA 950
64, 2. Center for Environmental Research, School of Chemistry, Physics and Environmental Sciences, University of Sussex, UK, 3. WRc NSF, UK)

III-8.
Measurement of lead, cadmium, arsenic, nickel, and mercury by INAA and PIXE**[Contribution Number: 1370]**
M. Freitas, M. Reis, M. Farinha, S. Almeida, C. Costa (Instituto Tecnológico e Nuclear, Portugal)

III-9.
Automatic monitoring of heavy metals in waters**[Contribution Number: 1371]**
E. Beinrohr (Department of Analytical Chemistry, Slovak Technical University, Slovakia)

III-10.
Determination and speciation of copper in natural waters with square wave anodic stripping voltametry**[Contribution Number: 1372]**
A. Bazzi, D. Hollandsworth, N. Irish (Department of Natural Sciences, University of Michigan)

III-11.
Total suspended matter and particulate lead speciation in the heavily polluted Western Harbour of Alexandria, Egypt**[Contribution Number: 1373]**
M.A.H. Saad (1), A.I. Beltagy (2), M.A. Fahmy (2), M.R. Abdel-Moati (1) and W.M. Mahmoud (2) (1. Department of Oceanography, University of Alexandria, Moharam Bay, Alexandria, Egypt. 2. Institute of Oceanography and Fisheries, Anfoushi, Alexandria, Egypt)

III-12.
Atomic absorption analysis accompanied by temperature control of element release: application to heavy metal TRIAD Hg-Cd-Pb**[Contribution Number: 1374]**
V. Tauson, Menshikov, Parkhomenko, Gelety (Siberian Branch, Russian Academy of Sciences)

III-13.
Determination of lead in water and sediment samples from two salty ponds and its relation with pH, salinity and sulfafe**[Contribution Number: 1375]**
C. Nava, E. Gutierrez and H. Medina (Dept. of Chemistry, Laboratory of Environmental Science, Experimental Faculty of Science, Zulia University, Venezuela)

III-14.
In situ measurements of trace metals in an oligotrophic lake: Comparison of results obtained by peepers and DGT**[Contribution Number: 1376]**
M.C. Alfaro-De la Torre and A. Tessier (INRS-Eau, Universite du Quebec, Canada)

Mining and Smelting

III-15.
Distribution of trace, minor and major elements in sediments around the petroleum production platform, Campos Basin- Rio de Janeiro, Brazil**[Contribution Number: 1377]**
Alvaro Ramon Coelho Ovalle (1), Carlos Eduardo Veiga de Carvalho (1), Maria Eulália Carneiro (2), Luiz Drude de Lacerda (3) & Carlos Eduardo Rezende (1) (1. Universidade Estadual do Norte Fluminense, LCA–CBB, Brazil, 2. Centro de Pesquisas Leopoldo A. Migues de Mello – PETROBRAS/CENPES, Brazil, 3. Universidade Federal Fluminense, Brazil)

III-16.
An overall view of cadmium and zinc contamination in Sepetiba Bay, Rio de Janeiro, Brazil**[Contribution Number: 1378]**
J. Maddock and L.D. Lacerda (Department of Geoquímica, UFF, Brazil)

III-17.
Impact of toxic metals from the Caribou gold mining areas in Nova Scotia Canada**[Contribution Number: 1379]**
H. Wong (National Water Research Institute, Environment Canada, Burlington, Ontario, Canada L7R 4A6), A Gauthier, G. Tetford (Environmental Protection Branch, Environment Canada, Nova Scotia), S. Beauchamp, R. Tordon (Atmospheric Science Division, Environment Canada, Nova Scotia)

III-18.
Impact of dismantled mines on water resources in Sardinia (Italy)**[Contribution Number: 1380]**
R. Cidu and L. Fanfani (Department of Earth Sciences, University of Cagliari, Italy)

III-19.
Heavy metal contamination of the Pilcomayo River, Bolivia**[Contribution Number: 1381]**
J. Miller (Department of Geosicences & Natural Resources Management, Western Carolina University, North Carolina), K. Hudson-Edwards (Birkbeck College, University of London, UK), M. Macklin (Institute of Geology and Earth Sciences, University College of Wales, UK), P. Lechler (Nevada Bureau of Mines and Geology, University of Nevada)

III-20.
Biogeochemical situation in mountains of Central Asia**[Contribution Number: 1382]**
M. Malgin and A. Puzanov (The Institute for Water and Environmental Problems, Siberian Branch of Russian Academy of Sciences)

III-21.
Atmospheric mercury contamination biomonitoring using epiphytic bromeliads (Tillandsia usneoides). Case Study: The gold shops in Porto Velho, Rondônia, Brazil**[Contribution Number: 1383]**
M. Vergotti (1), P. Gali (1), W. Bastos (1), E. Silveira (1), O. Malm (2), S. Santos (1), V. Maniesi (1), and J. Torres (2), (1. Biogeochemical Laboratory, UNIR, Geography Department, Federal University of the Rondônia, Brazil, 2. LPERF-IBCCF-UFRJ, Federal University of Rio de Janeiro, Brazil)

III-22.
Contamination for mercury in the small mining of the region de Atacama, Chile**[Contribution Number: 1384]**
E. Pesenti, E. Fernández, W. Silva (University of Atacama, Chile)

III-23.
Mushrooms from a Cd and Zn contaminated spruce forest: Occurrence of heavy metals and heavy-metal binding proteins**[Contribution Number: 1385]**
K. Yttri, R. Anderson, B. Berthelsen, C. Collin-Hansen, and E. Steinnes (Norwegian University of Science and Technology

III-24.
Aircraft study of the physical and chemical evolution of aerosols in smelter and power plant plumes**[Contribution Number: 1386]**
C. Banic, W. Leaitch, K. Strawbridge, D. Daggupaty, N. Shantz, J. Lu, N. Bhya, R. Tanabe (Meteoro-logical Service of Canada, Ontario), J. MacPherson (National Research Council of Canada), H. Wong (National

Water Research Institute, Canada), Z. Nejedly, J. Campbell (University of Guelph, Ontario, Canada), C. Gariepy, A. Simonetti (GEOTOP, University of Quebec (Montreal), Canada), J. Skeaff (CANMET, Natural Resources Canada), A. Chatt (Dalhousie University, Canada), M. Lamoureux (Saint Mary's University, Canada)

III-25.
Metal contamination at Deloro**[Contribution Number: 1387]**
T. Switzer and T. Hutchinson (Trent University, Environmental and Resource Studies Program, Ontario, Canada)

Rivers and Estuaries

III-26.
Present and historical distribution of heavy metals in coastal sediments of Southeastern Taiwan**[Contribution Number: 1388]**
J. Hung and J. Sheu (Institute of Marine Geology and Chemistry, National Sun Yat-Sen University, Taiwan)

III-27.
Preliminary assessment of metal contamination in the Zadar Bay (Croatia)**[Contribution Number: 1389]**
R. Zonta, L. Zaggia and F. Collavini (National Research Council, Italy)

III-28.
Heavy metals partitioning in bottom sediments of Paraíba do Sul River, Brazil**[Contribution Number: 1390]**
M. Molisani, M. Salmão, A. Ovalle (Laboratório de Ciências Ambientais, Universidade Estadual do Norte Fluminense, Brazil)

III-29.
Fe, Mn, Ni and Cd geochemical partitioning in sediments from the Negro River Argentina**[Contribution Number: 1391]**
M. Abrameto, M.I. Gil (FUNDAPA, Brazil), R. Freije (Universidad Nacional del Sur, Argentina), J. Marcovecchio (Institute Argentino de Oceanografía, Argentina)

III-30.
Heavy metal transfer in terrestrial ecosystems**[Contribution Number: 1392]**
N. Bogaert, G. Laing, F. Tack, M. Verloo (Laboratory of Analytical Chemistry and Applied Ecochemistry, Ghent University, Belgium), F. Hendrickx, J. Malfait, J. Mertens (Laboratory of Animal Ecology, University of Gent, Belgium)

III-31.
Hydrological control on the temporal variability of trace element concentration in the Amazon River and its main tributaries**[Contribution Number: 1393]**
P. Seyler, L. Maurice-Bourgoin, J. Guyot (ORSTOM, CP 7091, Brasil) and G. Boaventura (Instituto de Geociencias, Universidade de Brasilia, Brasil)

III-32.
Heavy metal discharge from Osellino Canal to the Venice Lagoon: Preliminary Results of the "Drain" Project**[Contribution Number: 1394]**
R. Zonta, F. Collavini, and L. Zaggia (National Research Council, Italy), C. Marinelli and O.E. Fagarazzi (SELC Inc., Italy)

III-33.
Vanadium distribution in the Seine estuary**[Contribution Number: 1395]**
B. Ouddane, M. Skiker, J.C. Fischer and M. Wartel (Université des Sciences et Technologies de Lille, Laboratoire de Chimie Analytique et Marine Bat. C8, France)

III-34.
The role of catchment of lake pollution by Hg, Pb and Cd at Lochnagar, Scotland**[Contribution Number:**

1396]
H. Yang (Environmental Change Research Centre, University College London, UK)

III-35.
Priority metal pollutants in sediments of a fishing lake impaired by man activities (Alexandria, Egypt) **[Contribution Number: 1397]**
O. El-Rayis (Oceanography Department, Faculty of Science, University of Alexandria, Egypt)

III-36.
Trace metals in the Venetian lagoon around the island of Murano (Venice, Italy)**[Contribution Number: 1398]**
L. Giusti (Department of Environmental Sciences, University of the West of England, Bristol) and H. Zhang (Dept. of Environmental Sciences, University of Lancaster, UK)

III-37.
A chronology of atmospheric silver in the sediments of the "Huzenbacher See", SW Germany**[Contribution Number: 1399]**
G. Muller (Institute of Environmental Geochemistry, University of Heidelberg, Germany)

III-40.
Development of heavy metal pollution in sediments of the Lower Neckar River during the past 25 years**[Contribution Number: 1400]**
A. Yahya and B. Pilz (University of Heidelberg, Germany)

III-41.
Study of particulate matter and heavy-metal fluxes in the Venice Canal network by large volume filtration and sediment traps**[Contribution Number: 1401]**
L. Zaggia, R. Zonta and F. Collavini (National Research Council, ISDGM, Italy)

III-42.
Trace metal distribution in surface sediments from the Eastern Brazilian Coast**[Contribution Number: 1402]**
L. Guedes et al. (Laboratorio de Ciencias Ambientais Universidade Estadual do Norte Fluminense, Brazil)

III-43.
Temporal Dynamic of Particulate and Dissolved Heavy Metals in the Paraibo Do Sul River, Rio De Janeiro, Brazil**[Contribution Number: 1403]**
M.S.M.B. Salomão, M.M. Molisani, and A.R.C. Ovalle (Laboratório de Ciências Ambientais, Universidade Estadual do Norte Fluminense, Brazil)

III-44.
Exploring Different Models for Estimating Critical Loads and Mercury Transfer Dynamics in Aquatic Ecosystems**[Contribution Number: 1404]**
H. Sverdrup (Chemical Engineering, Lund University, Sweden), L. Bringmark (Environmental Analysis, Environmental Protection Agency, Stockholm), H. Hultberg (Swedish Environmental Institute, Stockholm-Göteborg, Sweden)

Sources and Transport

III-45.
Reconstructing trace metal deposition by dendrochemical analysis: A comparison among tree species**[Contribution Number: 1405]**
S. Watmough and T. Hutchinson (Environmental and Resource Studies Program, Trent University, Ontario, Canada)

III-46.
Trace metal regional sources in east Baltic region and processes governing trace metal budget**[Contribution**

Number: 1406]
D. Ceburnis (Atmospheric Pollution Research Laboratory, Institute of Physics, Lithuania)

III-47.
Heavy metals emissions inventory and concentrations in the environment in Russia: Spatial and temporal trend analysis**[Contribution Number: 1407]**
V.A. Ginzburg and S.A. Gromov (Laboratory of Integrated Monitoring, Institute of Geography Russia)

III-48.
Long range transported aerosol sources appointment using space analysis in Preila and Rgtelik's monitoring stations**[Contribution Number: 1408]**
D. Valiulis, D. Ceburnis, K. Kvietkus (Atmospheric Pollution Research Laboratory, Institute of Physics, Lithuania)

III-49.
Semi-empirical modeling of trace metal deposition close to the point pollution sources**[Contribution Number: 1409]**
D. Ceburnis, J. Šakalys, D. Valiulis and K. Kvietkus (Atmospheric Pollution Research Laboratory, Institute of Physics, A. Gostauto 12, 2600 Vilnius, Lithuania)

III-50.
Long term assessment of heavy metals in the atmosphere of background regions of Russia and other NIS countries**[Contribution Number: 1410]**
S. Gromov, V. Ginzburg, S. Paramonov (Laboratory of Integrated Monitoring, Institute of Geography RAS, Russia), L. Burtseva (Institute of Global Climate and Ecology, Russia), N. Bunina (Hydrometobservatory, Moscow State University, Russia)

III-51.
Atmospheric heavy metals within the ECE region**[Contribution Number: 1411]**
T. Berg (Chemical Coordination Center of EMEP, Norway)

III-52.
Tracing the sources of atmospheric pollution on a global scale via lead isotopes in aerosols**[Contribution Number: 1412]**
A. Bolhöfer and K. Rosman (Dept. of Applied Physics, Curtin University of Technology, Australia)

III-53.
Recent emissions detected in the natural snowpack around a smelter at Rouyn-Noranda, Quebec**[Contribution Number: 1413]**
D. Kliza (Geological Survey of Canada, Canada), K. Telmer (University of Victoria, Canada), G. Bonham-Carter, G. Hall, R. Garrett (Geological Survey of Canada)

III-54.
Comparison of standard and differential biomonitoring using transplants**[Contribution Number: 1414]**
M. Freitas, M. Reis, A. Marques (Instituto Tecnológico e Nuclear, Portugal), H. Wolterbeek (Interfaculty Reactor Institute, The Netherlands)

III-55.
Binding mechanisms of metals in moss**[Contribution Number: 1415]**
G. May and E. Steinnes (Department of Chemistry, Norwegian University of Science and Technology)

III-56.
Heavy metals uptake and the growth pine and spruce wood**[Contribution Number: 1416]**
T. Chernenkova (Severtsov Institute of Ecology and Evolution, Russian Academy of Sciences)

III-57.
Comparative study on heavy metal pollutants released from industry in old and industrial areas**[Contribution Number: 1417]**

F.H. Abou El-Nour, E. Metwally and M.A. Helayel (Nuclear Chemistry Department, Hot Labs Center, Atomic Energy Authority, Cairo, Egypt)

III-58.
Heavy metal pollution in road deposited sediments, Palolo Valley, Honolulu, HI**[Contribution Number: 1418]**
J. Bussen, R. Sutherland (Geomorphology Laboratory, Department of Geography, University of Hawaii), F. Tack (Laboratory of Analytical Chemistry and Applied Ecochemistry, University of Ghent)

III-59.
Impact of introducing non-leaded petrol in relation to lead dispersion along major motorways**[Contribution Number: 1419]**
N. Ward and R. Hares (ICP-MS Facility, Department of Chemistry, University of Surrey, Guildford, UK)

III-60.
Phasing out cadmium and lead- emissions and sediment loads in an urban area**[Contribution Number: 1420]**
A. Jonsson (Department of Water and Environmental Studies, Linköping University, Sweden) and M. Lindström (Department of Earth Sciences, Uppsala University, Sweden)

III-61.
Usage of mass element fluxes from small catchments in the assessment of critical loads of heavy metals**[Contribution Number: 1421]**
I. Skorepová (Czech Environmental Institute, the Czech Republic), D. Fottová (Czech Geological Survey, Czech Republic)

III-62.
An integrated pollutant emission register in the Netherlands**[Contribution Number: 1422]**
P. van der Most (Inspectorate for Environmental Protection, Department for Monitoring and Information Management, The Netherlands)

III-63.
Absolute deposition maps on heavy metals for Europe based on moss surveys**[Contribution Number: 1423]**
T. Berg (Norwegian Institute for Air Research, Norway), Å. Rühling (Ekokonsult AB), E. Steinnes (Norwegian University of Science and Technology, Norway)

III-64.
Atmospheric emissions of trace metals in the Great Lakes**[Contribution Number: 1424]**
N. Pirrone (CNR Institute for Atmospheric Pollution, c/o UNICAL, Italy) and J. Nriagu (Department of Environmental Health Sciences, School of Public Health, University of Michigan)

III-65.
Sources of atmospheric particulate heavy metals in urban Detroit during the summer of 1996**[Contribution Number: 1425]**
A. Gildemeister, G. Keeler (University of Michigan Air Quality Laboratory, School of Public Health, University of Michigan), J. Graney (Department of Geological and Environmental Studies, SUNY, New York)

III-66.
Developing relationships between fluxes of natural source mercury and environmental and biogeochemi-cal parameters for the purpose of scaling up fluxes**[Contribution Number: 1426]**
G. Dias (1), G. Edwards (1), P. Rasmussen (2), W. Schroeder (3), J. Kemp (1), C.F. Hubble (4), L.H. Mitchell (1) (1. School of Engineering, University of Guelph, Ontario, Canada, 2. Health Canada, Ontario, 3. Meteorological Service of Canada, Ontario, 4. RWDI, Inc., Ontario)

III-67.
Regional budgets of some heavy metals in Europe**[Contribution Number: 1427]**
I. Ilyin (Meterological Synthesizing Centre, Russia)

III-68.
Visualization, GIS and geostatistics for interpretation of geochemical data**[Contribution Number: 1428]**
K. Grunfeld (Division of Geoinformatics, Royal Institute of Technology, Stockholm, Sweden)

III-69.
Lead pollution in south eastern part of Madhya Pradesh (India)**[Contribution Number: 1429]**
A. Kamavisdar (Central Fuel Research Institute, India)

Water and Wastewaters

III-70.
Chromium removal from the tanning and plating industries by using Sargassum Sp. biomass**[Contribution Number: 1430]**
S. Aparicio (LULE, University of Technology, Sweden), R. Santos, L. Sobral (Center for Mineral Technology, Brazil)

III-71.
Heavy metals removal from municipal and industrial sludges**[Contribution Number: 1431]**
M. Lasheen, A. Ashmawy, H. Ibrahim (Department of Water Pollution, National Research Center, Dokki, Cairo, Egypt)

III-72.
Characterization and leaching of heavy metals from municipal solid waste incinerator fly ash**[Contribution Number: 1432]**
C. Ferreira (Escola Superior Agrária de Coimbra, codigo postal Bencanta, Portugal), S. Llamas (Facultad de Ingenieria, Universidad Nacional de Cuyo, Argentina) and M. Almeida (Faculdade de Engenharia da Universidade do Porto, Portugal)

III-73.
Distribution and sequential extraction of heavy metals in solidwaste from the industrial belt of Delhi, India**[Contribution Number: 1433]**
M. Moturi (Kenya Industrial Research and Development Institute, Kenya), M. Rawat and V. Subramanian (School of Environmental Sciences, Jawaharlal Nehru University, India)

III-74.
Assessment of pollution load with respect to heavy metals from the wastewater of some industrial areas of Delhi, India**[Contribution Number: 1434]**
M. Rawat (1), M. Moturi (2), V. Subramanian (1), (1. School of Environmental Sciences, Jawaharlal Nehru University, India, 2. Kenya Industrial Research and Development Institute)

III-75.
Development of granules for the heavy metal removal from mine waters**[Contribution Number: 1435]**
T. Zoumis and W. Calmano (Department of Environmental Science and Technology, Technical University of Hamburg-Harburg, Germany)

III-76.
Adsorption of heavy metals by bone charcoal: its potential as a water treatment clean-up**[Contribution Number: 1436]**
J. Wilson, I. Pulford (Environmental, Agricultural and Analytical Chemistry Department, University of Glasgow, UK) and S. Thomas (Tate and Lyle Process Technology, Scotland, UK)

III-77.
Structure of fruticulose-green moss spruce forest in vicinities of metallurgical plant**[Contribution Number: 1437]**
T. Chernenkova and A. Severtsov (Institute of Ecology and Evolution, Russian Academy of Sciences)

III-78.
Chromium in tannery effluent and its recovery**[Contribution Number: 1438]**

A. Deep, S. Tandon, A. Khwaja (Department of Chemistry, University of Roorkee, India)

III-79.
Recovery of Heavy Metals from Spent Nickel-Cadmium Batteries **[Contribution Number: 1439]**
L. Barros, A. Pacheco, F. Margarido (CVRM, Instituto Superior Técnico, Portugal)

III-80.
Removal of lead from aqueous solutions using activated alumina **[Contribution Number: 1440]**
T. Kramer, P. Wootton, C. Lange (Department of Civil Engineering, Auburn University, Alabama)

III-81.
Laboratory flux measurement system to study mercury fluxes over soils **[Contribution Number: 1441]**
E. Bahlmann and R. Ebinghaus (GKSS Research Center, Germany)