

# Pollution Permanent Monitoring Panel 2004 Annual Report

*World Federation of Scientists  
August 2004 Seminar  
Erice, Italy*



*World Federation of Scientists Pollution Task Force*

*Richard Ragaini, Ph.D., Lawrence Livermore Laboratory,  
Livermore, California, USA (Panel Chairman)*



## Pollution Permanent Monitoring Panel: Priority of Issues 2004



- **Cleanup of Polluted Soil and Water Supplies, Such as:**
  - ◆ Industrial wastewater
  - ◆ Municipal wastewater
  - ◆ Agricultural runoff
  - ◆ Nuclear weapons testing
  - ◆ Military operations
  - ◆ Trans-boundary pollution
- **Reduction of Local Air Pollution from Stationary and Mobile Sources in Mega-cities and Long-range Air Pollution From Acid Rain**
  - ◆ To reduce human and environmental health risks or potential risks to receptors
- **Prevention/Minimization of Future Air and Water Pollution**
- **Training Scientists from Developing Countries to Identify, Monitor, and Remediate Pollution**



# 2003 Pollution Permanent Monitoring Panel Workshop: *Monitoring and Stewardship of Legacy Nuclear and Hazardous Waste Sites*



- **Scope of Worldwide Problem**
  - ◆ 75 million cubic meters of contaminated soils
  - ◆ 1.8 billion cubic meters of contaminated waters
- **Purpose of Workshop**
  - ◆ Provide recommendations to international communities on how to develop and share monitoring and stewardship science and technology
  - ◆ International Attendees: USA, Europe, Canada, Malaysia, Japan, and Russia
- **Themes**
  - ◆ Contamination, containment, and control
  - ◆ Monitoring and sensors
  - ◆ Decision-making and institutional performance
  - ◆ Safety systems and institutional controls
- **Workshop Organizers:** Dr. Lorne G. Everett, The Shaw Group, USA  
Dr. Stephen Kowall, Idaho National Laboratory, USA



## Pollution Permanent Monitoring Panel: Past Activities



- **1998: Workshop on Impacts of Pharmaceutical in Treatment Plant Wastewater Used for Irrigation**
- **1999: Session on Contamination of Groundwater by Hydrocarbons**
- **1999: Workshop on Black Sea Pollution**
- **2000: Session on Contamination of Groundwater by MTBE**
- **2000: Workshop of Black Sea Pollution by Petroleum Hydrocarbons**
- **2001: Workshop on Caspian Sea Pollution**
- **2001: Session on Trans-Boundary Water Conflicts**
- **2002: Talk on Radioactivity Contamination of Soils and Groundwater**
- **2002: Talk on Environmental Security in the Middle East/Central Asia**
- **2003: Session on Water Conflicts in the Middle East**
- **2003: Workshop on Monitoring and Stewardship of Legacy Nuclear and Hazardous Waste Sites**



## Pollution Permanent Monitoring Panel Attendees to 2004 Seminar in Erice



### Chairman

- **Dr. Richard C. Ragaini, Lawrence Livermore National Laboratory, USA**
- Ms. Gina Calderone, EA Science and Technology, USA
- Prof. Joesph Chahoud, University of Bologna, Italy
- Dr. Lorne G. Everett, The Shaw Group, USA
- Dr. Stephen Kowall, Idaho National Engineering & Environmental Laboratory
- Prof. Sergio Martellucci, University of Rome, Italy
- Prof. Vittorio Ragaini, University of Milan, Italy
- Prof. Zenonas Rudzikas, Lithuanian Academy of Sciences, Lithuania
- Prof. Albert Tavkhelidze, Georgian Academy of Sciences, Georgia
- Dr. Andy Tompson, Lawrence Livermore National Laboratory, USA



# August 2003 Workshop Recommendations: *Monitoring and Stewardship of Legacy Nuclear and Hazardous Waste Sites*



- **Stakeholder Involvement**
  - ◆ Stakeholder involvement must begin early
  - ◆ Stakeholders must fully participate in decisions
  - ◆ Mutual trust among stakeholders is necessary
  - ◆ Scientists must be credible, honest, and effective communicators
- **Monitoring of Legacy Wastes and Burial Sites**
  - ◆ Need for near source monitoring
  - ◆ Ability to monitor should be a design requirement
  - ◆ Monitor the condition of the containment system
  - ◆ Add vadose zone monitoring to groundwater monitoring
- **Containment of Legacy Wastes**
  - ◆ Use goal-based regulations rather than prescriptive rules
  - ◆ Address component failures before system-wide failures
  - ◆ Optimize data collection
  - ◆ Develop reliable predictors of future performance
  - ◆ Reduce life-cycle costs

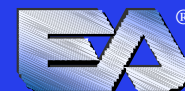


## Pollution Permanent Monitoring Panel Activities:

### August 2004 Seminar, Erice



- **Pollution Permanent Monitoring Panel Input to Task Force for World Federation of Scientists (WFS) Regional Resources Commission on Sicily**
  - ◆ Meeting with Prof. Aureli, University of Catania (emeritus)
  - ◆ Revised proposal *Soil and Groundwater Pollution Vulnerability Mapping and Environmental Database Project for Sicily* (lead: Gina Calderone, USA)
- **Planning an August 2005 workshop on *Waste Management and Soil/Groundwater Remediation in Southeast Asia*** (lead: Balamurugan Gurusamy, Malaysia)
- **Planning future activities on international approaches to radioactive and hazardous waste repositories** (lead: Stephen Kowall, USA)
- **Planning future activities on cleanup and remediation responses to nuclear, chemical, and biological warfare agents**



**Pollution Permanent  
Monitoring Panel  
Proposal:**  
*Soil and Groundwater  
Pollution Vulnerability  
Mapping and  
Environmental Database  
Management  
for Sicily*

*Richard Ragaini, Lawrence Livermore Laboratory,  
USA (Chairman)*

*Lorne Everett, The Shaw Group, USA*

*Vittorio Ragaini, University of Miliano, Italy*

*Ilkay Salihoglu, Institute of Marine Studies, Turkey*

*Audrey Rybalchenko, FGUP VNIPI  
Promtehnologii, Russia*

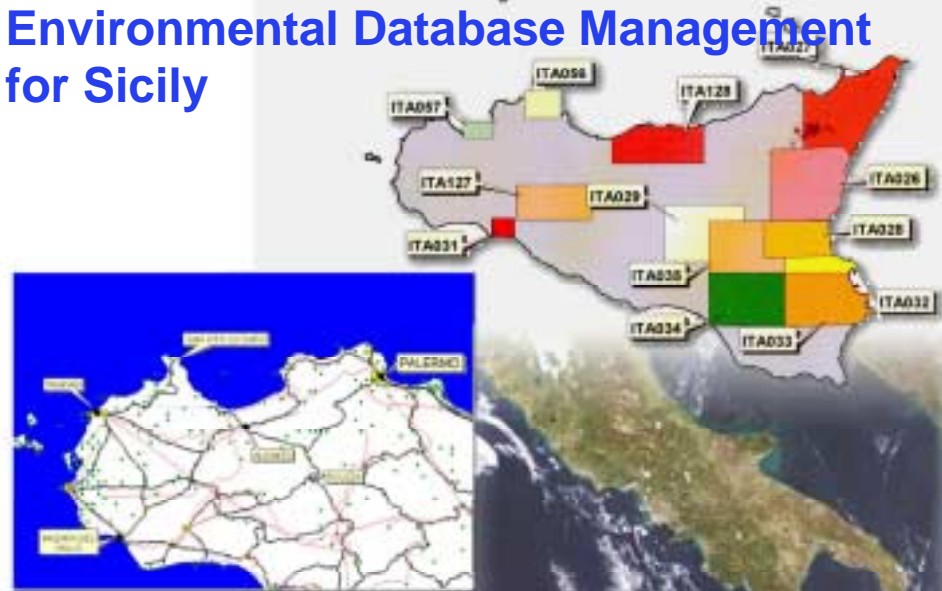
*Igor Zektser, Water Problems Institute, Russia*

*Allan Duncan, NIREX Waste Management  
Committee, United Kingdom*

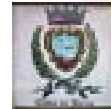
*Gina Calderone, EA Science and Technology, USA*

*David Smith, Lawrence Livermore Laboratory, USA*

**Sicilian Regional Resources Commission,  
Pollution Task Force:  
Proposal for Soil and Groundwater  
Pollution Vulnerability Mapping and  
Environmental Database Management  
for Sicily**



Submitted to:



**Professor Antonino Zichichi  
World Federation of Scientists  
Lausanne, Switzerland**

Submitted by:  
**World Federation of Scientists  
Pollution Panel Task Force**





# Proposal for Soil and Groundwater Pollution Vulnerability Mapping and Environmental Database Management for Sicily



## Database Development

- Identify existing data sources:
  - Universities of Catania, Messina, and Palermo
  - Italian Civil Protection Agency
  - Additional Government Agencies
  - CNR—National Research Council
- Integrate data within central database

## Pollution Vulnerability Mapping

- Develop a GIS tool to display all available data
- Generate pollution vulnerability maps for Sicily, including local and regional scale maps
- Partner with Italian and Sicilian government bodies to identify significant data gaps

## Web-Based Deployment and Training

- Create Web server to house comprehensive database of environmental and pollution vulnerability data
- Utilize Internet-based tools to display pollution vulnerability maps
- Complete training for GIS and database and aquifer vulnerability maps
- Inform interested parties of pollution prevention techniques

# COMPLETION OF THE POLLUTION VULNERABILITY MAPPING DATABASE

## ESTIMATED PROJECT BUDGET

Project Phase	Primary Team Members	Range of Funding Required
<b>DEVELOP A COMPREHENSIVE DATABASE</b>	Professor Aurelio Aureli, University of Catania	<b>\$200,000-400,000</b>
	Professor Giuseppe Tito Aronica, University of Messina	
	Professor Igor Zektser, Russian Academy of Sciences, Water Problems Institute	
<b>POLLUTION VULNERABILITY MAPPING DATABASE</b>	Professor Aurelio Aureli, University of Catania	<b>\$375,000-450,000</b>
	University of California	
	Professor Igor Zektser, Russian Academy of Sciences, Water Problems Institute	
	EA Science and Technology	
<b>WEB-BASED DEPLOYMENT</b>	EA Science and Technology	<b>\$120,000-160,000</b>
<b>STAKEHOLDER AND TECHNICAL MEETINGS</b>	Professor Aurelio Aureli, University of Catania	<b>\$80,000-\$90,000</b>
	World Federation of Scientists Pollution Panel Chairman and Members	
	Professor Giuseppe Tito Aronica, University of Messina	
	Professor Igor Zektser, Russian Academy of Sciences, Water Problems Institute	
	EA Science and Technology	
	<b>TOTAL</b>	<b>\$925,000-\$1,300,000</b>





# Discussion

