



# Journal of Environmental Protection



ISSN: 2152-2197



# Journal Editorial Board

ISSN: 2152-2197 (Print), 2152-2219 (Online)

<http://www.scirp.org/journal/jep>

---

## Editors-in-Chief

**Prof. Thangarasu Pandiyan**

National Autonomous University of Mexico (UNAM), Mexico

**Prof. Qingren Wang**

University of Florida, USA

## Editorial Advisory Board

**Prof. Hongyan Liu**

Peking University, China

## Editorial Board

**Dr. Josh T. Ackerman**

U.S. Geological Survey, USA

**Dr. Nanjappa Ashwath**

Central Queensland University, Australia

**Prof. Jayajit Chakraborty**

University of South Florida, USA

**Prof. Shuguang Deng**

New Mexico State University, USA

**Prof. Larry Eugene Erickson**

Kansas State University, USA

**Prof. Ludmila A. Golovleva**

Russian Academy of Sciences, Russia

**Prof. Chin-Pao Huang**

University of Delaware, USA

**Prof. Madan Kumar Jha**

Indian Institute of Technology Kharagpur, India

**Dr. Jan Åke Jönsson**

Lund University, Sweden

**Dr. Ganesh Raj Joshi**

United Nations Center for Regional Development (UNCRD), Japan

**Prof. Rameshwar S. Kanwar**

Iowa State University, USA

**Prof. Hyun-Joong Kim**

Seoul National University, South Korea

**Prof. Raghava R. Kommalapati**

Prairie View A&M University, USA

**Prof. Ashok Kumar**

University of Toledo, USA

**Dr. Robert Li**

United States Department of Agriculture-Agricultural Research Service, USA

**Prof. Roberto Manfredi**

University of Bologna, Italy

**Prof. Krishna Mazumdar**

Indian Statistical Institute, India

**Prof. Jiangming Mo**

Chinese Academy of Sciences, China

**Dr. Subhash C. Mojumdar**

University of Guelph, Canada

**Prof. Saied Mostaghimi**

Virginia Polytechnic Institute and State University, USA

**Dr. Shaibal Mukerjee**

U.S. Environmental Protection Agency, USA

**Prof. Pucheng Pei**

Tsinghua University, China

**Dr. Alexey V. Polonikov**

Kursk State Medical University, Russia

**Dr. Mohammad Nahid Siddiqui**

King Fahd University of Petroleum & Minerals, Saudi Arabia

**Dr. Gilbert Sigua**

United States Department of Agriculture-Subtropical Agricultural Research Station, USA

**Prof. Emilson Caputo Delfino Silva**

Georgia Institute of Technology, USA

**Prof. Hongwen Sun**

Nankai University, China

**Dr. Xiangjun Tian**

Chinese Academy of Sciences, China

**Dr. Cornelia Vasile**

Laval University, Canada

**Prof. Ernest K. Yanful**

University of Western Ontario, Canada

**Prof. Qingwei Yang**

Chongqing Jiaotong University, China

**Dr. Ierotheos Zacharias**

University of Western Greece, Greece

## TABLE OF CONTENTS

**Volume 4    Number 11**

**November 2013**

<b>Spatial Variation of Dissolved Nutrient and Heavy Metal Concentrations in River Bed Sediments as Influenced by Land-Use Patterns in Ogun-Osun River Basin, Nigeria</b>	
A. Oke, A. Sangodoyin, K. Are, A. Adelana.....	1203
<b>Modeling of Quaternary Groundwater Pollution Risk by GIS and Multicriteria Analysis in the Southern Part of Abidjan District (Côte d'Ivoire)</b>	
I. K. Kouame, A. G. Douagui, K. Koffi, B. Dibi, L. K. Kouassi, I. Savane.....	1213
<b>Biofuel Production from the Orbetello Lagoon Macrophytes: Efficiency of Lipid Extraction Using Accelerate Solvent Extraction Technique</b>	
M. Renzi, A. Giovani, S. E. Focardi.....	1224
<b>Biomass Accumulation and Water Purification of Water Spinach Planted on Water Surface by Floating Beds for Treating Biogas Slurry</b>	
X. M. Yu, Z. H. Li, S. Zhao, K. Li.....	1230
<b>Survey of Parasitologique Surface Water Quality (R'Dom Oued Sidi Kacem, Morocco)</b>	
F. B. Harkati, K. Elkharrim, S. Sanae, D. Belghyti.....	1236
<b>The Legal Framework for Solid Waste Disposal and Management in Kwara State, Nigeria</b>	
H. Ijaiya.....	1240
<b>Heavy Metals Nickel and Chromium in Sediments in the Juru River, Penang, Malaysia</b>	
A. A. Idriss, A. K. Ahmad.....	1245
<b>Biosorption and Chemical Precipitation of Lead Using Biomaterials, Molecular Sieves, and Chlorides, Carbonates, and Sulfates of Na &amp; Ca</b>	
L. Agwaramgbo, N. Magee, S. Nunez, K. Mitt.....	1251
<b>State of Air Quality in Malawi</b>	
H. W. T. Mapoma, X. J. Xie.....	1258
<b>Analysis of Health Risk Due to the Presence of Radioactivity and Chemical Elements in Groundwater, Aldama Municipality, Chihuahua, Mexico</b>	
L. Villalba, L. Colmenero-Sujo, A. Pinales-Munguia, G. Estrada-Gutiérrez, H. Rubio-Arias, F. Mireles-Garcia, I. Dávila-Rangel.....	1265
<b>Assessing Fecal Contamination in Groundwater from the Tulum Region, Quintana Roo, Mexico</b>	
R. Ma. Leal-Bautista, M. Lenczewski, C. Morgan, A. Gahala, J. E. McLain.....	1272
<b>Small Mammal Habitat Use within Restored Riparian Habitats Adjacent to Channelized Streams in Mississippi</b>	
P. C. Smiley Jr., C. M. Cooper.....	1280
<b>Heavy Metals Distribution in Soil, Water, Vegetation and Meat in the Regions of East-Kazakhstan</b>	
A. Kakimov, Z. Kakimova, Z. Yessimbekov, A. Bepeyeva, K. Zharykbasova, Y. Zharykbasov.....	1292
<b>Development of a Water Quality Index (WQI) of an Artificial Aquatic Ecosystem in Mexico</b>	
H. Rubio-Arias, J. M. Ochoa-Rivero, R. M. Quintana, R. Saucedo-Teran, R. C. Ortiz-Delgado, N. I. Rey-Burciaga, J. R. Espinoza-Prieto.....	1296

**PAHs in Seawater of the Semi-Closed Areas along the Alexandria Coast of Egyptian Mediterranean Sea**

M. A. Shreadah, M. I. A. Moneim, T. O. Said, E. M. I. Fathallah, M. E. Mahmoud.....1307

**A Number Description of Ghanaian Water Quality—A Case Study of the Southwestern and Coastal Rivers Systems of Ghana**

H. F. Darko, O. Ansa-Asare, A. Paintsil.....1318

---

The figure on the front cover is from the article published in *Journal of Environmental Protection*, 2013, Vol. 4, No. 11, pp. 1280-1291 by Peter C. Smiley Jr. and Charles M. Cooper.



# **Journal of Environmental Protection (JEP)**

## **Journal Information**

### **SUBSCRIPTIONS**

The *Journal of Environmental Protection* (Online at Scientific Research Publishing, [www.SciRP.org](http://www.SciRP.org)) is published monthly by Scientific Research Publishing, Inc., USA.

#### **Subscription rates:**

Print: \$79 per issue.

To subscribe, please contact Journals Subscriptions Department, E-mail: [sub@scirp.org](mailto:sub@scirp.org)

### **SERVICES**

#### **Advertisements**

Advertisement Sales Department, E-mail: [service@scirp.org](mailto:service@scirp.org)

#### **Reprints (minimum quantity 100 copies)**

Reprints Co-ordinator, Scientific Research Publishing, Inc., USA.

E-mail: [sub@scirp.org](mailto:sub@scirp.org)

### **COPYRIGHT**

Copyright©2013 Scientific Research Publishing, Inc.

All Rights Reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photocopying, recording, scanning or otherwise, except as described below, without the permission in writing of the Publisher.

Copying of articles is not permitted except for personal and internal use, to the extent permitted by national copyright law, or under the terms of a license issued by the national Reproduction Rights Organization.

Requests for permission for other kinds of copying, such as copying for general distribution, for advertising or promotional purposes, for creating new collective works or for resale, and other enquiries should be addressed to the Publisher.

Statements and opinions expressed in the articles and communications are those of the individual contributors and not the statements and opinion of Scientific Research Publishing, Inc. We assume no responsibility or liability for any damage or injury to persons or property arising out of the use of any materials, instructions, methods or ideas contained herein. We expressly disclaim any implied warranties of merchantability or fitness for a particular purpose. If expert assistance is required, the services of a competent professional person should be sought.

### **PRODUCTION INFORMATION**

For manuscripts that have been accepted for publication, please contact:

E-mail: [jep@scirp.org](mailto:jep@scirp.org)



## Journal of Environmental Protection (JEP)

ISSN: 2152-2197(Print) ISSN: 2152-2219(Online)

<http://www.scirp.org/journal/jep>

JEP is an international refereed journal dedicated to the latest advancement of Environmental Protection. The goal of this journal is to keep a record of the state-of-the-art research and promote the research work in these fast moving areas.

### Editors-in-Chief

**Prof. Thangarasu Pandiyan**

National Autonomous University of Mexico (UNAM), Mexico

**Prof. Qingren Wang**

University of Florida, USA

### Subject Coverage

This journal invites original research and review papers that address the following issues in Environmental Protection. Topics of interest include, but are not limited to:

<ul style="list-style-type: none"> <li>● <b>Air pollution and air quality</b> <ul style="list-style-type: none"> <li>Air pollution monitoring and modeling</li> <li>Air pollution prevention and control</li> <li>Air quality measurement and management</li> <li>Sources of air pollution</li> <li>Urban/indoor air pollution and control</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>● <b>Environmental pollution and public health</b> <ul style="list-style-type: none"> <li>Chemical pollutants and its effects on health</li> <li>Effects of air pollution on public health</li> <li>Food and drug safety control</li> <li>Global climate changes and human health</li> <li>Land pollution and its effects on health</li> </ul> </li> </ul>
<ul style="list-style-type: none"> <li>● <b>Ecosystem restoration, toxicology and sustainability</b> <ul style="list-style-type: none"> <li>Ecosystem restoration</li> <li>Environmental toxicology</li> <li>Greenhouse gas emission monitoring and solutions</li> <li>Hazardous materials management</li> <li>Radiation safety in atomic industry</li> <li>Solid waste management</li> <li>Sustainable development of environment and ecosystem</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>● <b>Hydrology and water quality</b> <ul style="list-style-type: none"> <li>Ground water pollution control</li> <li>Hydrobiology and water pollution</li> <li>Methods of monitoring water quality</li> <li>Modeling and measuring of water pollution</li> </ul> </li> </ul>
<ul style="list-style-type: none"> <li>● <b>Environment assessment and policy</b> <ul style="list-style-type: none"> <li>Environmental impact assessment</li> <li>Environmental policy</li> <li>Risk assessment of contaminated environments</li> <li>Water resources and quality assessment</li> <li>Water resource protection and sustainable use</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>● <b>Wastewater treatment and utilization</b> <ul style="list-style-type: none"> <li>New wastewater treatment technologies</li> <li>New water purification technologies</li> <li>Purification of drinking-water supplies</li> <li>Treatment, disposal and discharge of wastewater</li> </ul> </li> </ul>

We are also interested in short papers (letters) that clearly address a specific problem, and short survey or position papers that sketch the results or problems on a specific topic. Authors of selected short papers would be invited to write a regular paper on the same topic for future issues of the **JEP**.

### Notes for Intending Authors

Submitted papers should not have been previously published nor be currently under consideration for publication elsewhere. Paper submission will be handled electronically through the website. All papers are refereed through a peer review process. For more details about the submissions, please access the website.

### Website and E-Mail

<http://www.scirp.org/journal/jep>

E-mail: [jep@scirp.org](mailto:jep@scirp.org)

## ***What is SCIRP?***

Scientific Research Publishing (SCIRP) is one of the largest Open Access journal publishers. It is currently publishing more than 200 open access, online, peer-reviewed journals covering a wide range of academic disciplines. SCIRP serves the worldwide academic communities and contributes to the progress and application of science, by delivering superior scientific publications and scientific information solution provider that enable advancement in scientific research.

## ***What is Open Access?***

All original research papers published by SCIRP are made freely and permanently accessible online immediately upon publication. To be able to provide open access journals, SCIRP defrays operation costs from authors and subscription charges only for its printed version. Open access publishing allows an immediate, world-wide, barrier-free, open access to the full text of research papers, which is in the best interests of the scientific community.

- High visibility for maximum global exposure with open access publishing model
- Rigorous peer review of research papers
- Prompt faster publication with less cost
- Guaranteed targeted, multidisciplinary audience



**Scientific  
Research**

**Website: <http://www.scirp.org>**

**Subscription: [sub@scirp.org](mailto:sub@scirp.org)**

**Advertisement: [service@scirp.org](mailto:service@scirp.org)**