

# Table of Contents

|                                                                                                                                                  |           |
|--------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
| <b>Preface .....</b>                                                                                                                             | <b>1</b>  |
| <b>Integration of Environmental Information in Europe .....</b>                                                                                  | <b>1</b>  |
| <i>Blaschke, T., Mittlböck, M., Biberacher, M. Gadocha, S., Vockner, B., Hochwimmer, B. und Lang, S.:</i>                                        |           |
| The GEOSS - ENERGEO portal: towards an interactive platform to calculate, forecast and monitor the environmental impact of energy carriers ..... | 2         |
| <i>Marsh, J., Maurer, L. und Molinari, F.:</i>                                                                                                   |           |
| Social Validation of INSPIRE Annex III Data Structures in EU Habitats .....                                                                      | 10        |
| <i>Steuer, H., Kunert, M., Schulz, M. und Schilcher, Prof. M.:</i>                                                                               |           |
| Standards based and automated processing of Forest Spatial Indicators in the context of GMES and INSPIRE .....                                   | 17        |
| <b>ICT for Environmental Sustainability .....</b>                                                                                                | <b>22</b> |
| <i>Becker, J., Maurer, L. und Tochtermann, K.:</i>                                                                                               |           |
| Web-based Support for Community Building of an European network of experts & professionals of ICT for environmental sustainability .....         | 23        |
| <i>Chiabai, A. und Maurer, L.:</i>                                                                                                               |           |
| Analysis of ICT Research Demand in Environmental Research: A User-Centric Approach .....                                                         | 33        |
| <i>Hřebíček, J. und Pillmann, W.:</i>                                                                                                            |           |
| eEnvironment and the Single Information Space in Europe for the Environment .....                                                                | 45        |
| <i>Maurer, L., Marsh, J. und Tochtermann, K.:</i>                                                                                                |           |
| Limitations and Potential of Information and Communication Technologies for Environmental Sustainability .....                                   | 56        |
| <i>Stehliková, M.:</i>                                                                                                                           |           |
| Czech and Slovak Research Programmes in the Field of ICT for Environmental Sustainability .....                                                  | 64        |
| <i>Carrara, P.:</i>                                                                                                                              |           |
| The Italian Survey on ICT in Environmental and Sustainability Research within ICT-ENSURE: Experiences and Lessons Learned .....                  | 73        |
| <i>Ribeiro, A.B. und Fonseca, A.:</i>                                                                                                            |           |
| A Glance on ICT Programmes and Projects in the Field of Sustainable Development in Portugal .....                                                | 82        |
| <i>Schneider, H., Geiger, W. und Lutz, R.:</i>                                                                                                   |           |
| National European Research Programmes in the Field of ICT for Environmental Sustainability .....                                                 | 93        |
| <i>Lutz, R., Geiger, W., Schmitt, C. und Schreiber, M.:</i>                                                                                      |           |
| Information System on Literature in the Field of ICT for Environmental Sustainability .....                                                      | 104       |

**Modeling ICT for Environmental Sustainability..... 112**

*Pillmann, W. und Simon, K.-H.:*  
Meta-Modeling as a Tool to Access the European Environmental Information Space .....113

*Isenmann, R.:*  
Modeling environmental information relevant for industry in the European information space .....123

*Fleissner, P.:*  
Inserting the Economy into the Environmental Meta-Model .....136

*Gnauck, A. und Pillmann, W.:*  
A Meta-model for Water Quantity and Water Quality.....148

**ICT and Climate Change ..... 155**

*Manh, V.V., Hoang, T.M. und Van, P.T.:*  
Using environmental niche model to study the distribution of Tonkin snub-nosed monkey  
(*Rhinopithecus avunculus*) in the Northeastern Vietnam under some climate change scenarios .....156

*Michel, F. und Steffen, D.:*  
Visualization for Climate Change Adaptation in SUDPLAN .....165

*Storch, H., Downes, N. und Rujner, H.:*  
The Challenge of Spatial Information Management for Adaptation to Climate Change in Ho Chi  
Minh City .....169

*Zapico, J.L., Kjelkerud, D., Berggren, H., Turpeinen, M. und Brandt, N.:*  
Carbon.to: improving the understanding of carbon dioxide information .....177

**Environmental Management Information- and Decision Support Systems ..... 186**

*Rezgui, A. und Naana, M.:*  
Improving of environmental management accounting system for support the environmental  
information management.....187

*Allam, N., Junker, H. und Gómez, J.M.:*  
Collaborative corporate environmental management information systems .....197

*Giesen, N., Haak, L. und Gómez, J.M.:*  
DEEBIS-Net: Doctoral Education in Environmental and Business Information Systems - Bi-  
national PhD-Programme with Cuba .....205

*Arndt, H.-K. und Jacob, S.:*  
Ein Konzept zur Steuerung von Organisationen bei unklaren Zieldefinitionen unter  
Berücksichtigung von ökologischen Forderungen mit Hilfe von semantischen Netzen.....212

*Jamous, N., Kassem, G., Gómez, J.M. und Dumke, R.:*  
Proposed Light-Weight Composite Environmental Performance Indicators (LWC-EPI) Model .....222

|                                                                                                                                                                                                                                                  |            |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|
| <i>Junker, H.:</i><br>Die Beliebigkeit betrieblicher Umweltinformationssysteme – eine Polemik .....                                                                                                                                              | 232        |
| <i>Krehahn, P., Wohlgemuth, V. und Meyer, H.A.:</i><br>UxLab: Usability Optimization Case Study of a Environmental Management Information System<br>(EMIS) using Eyetracking Studies .....                                                       | 248        |
| <i>Rudolf, H.:</i><br>Umweltmanagement mit envVision: Eine nachhaltige GIS-gestützte Lösung für die Umsetzung<br>der EU-Umgebungsärm- und Luftqualitätsrichtlinie .....                                                                          | 258        |
| <i>Meyer, S., Pollman, O., Raschke, S., Blumenstein, O., van Rensburg, L. und Tobler, H.:</i><br>Decision support systems for environmental problems: Scientific approach, requirements of<br>structure and data on specific purpose types ..... | 269        |
| <i>Möller, A.:</i><br>About the Sense of Useless Software .....                                                                                                                                                                                  | 279        |
| <i>Pehlken, A., Rolbiecki, M., Decker, A. und Thoben, K.-D.:</i><br>Contribution of Material Flow Assessment in Recycling Processes to Environmental Management<br>Information Systems (EMIS) .....                                              | 288        |
| <i>Pontikakos, C. und Tsiligiridis, T.:</i><br>Location aware system for olive fruit fly spray .....                                                                                                                                             | 295        |
| <i>Ziep, T., Krehahn, P. und Wohlgemuth, V.:</i><br>Mobile Applications for Industrial Environmental Protection .....                                                                                                                            | 306        |
| <b>Betriebliche Umweltinformationssysteme .....</b>                                                                                                                                                                                              | <b>314</b> |
| <i>Stranz, S., Finkbeiner, M. und Ackermann, R.:</i><br>INSPIRE-Daten für die Ökologische Risikoanalyse .....                                                                                                                                    | 315        |
| <i>Arndt, H.-K. und Jacob, S.:</i><br>EnviroMaps – Eine Modellierungsvorschrift zur Abbildung von Umweltkennzahlensystemen mit<br>Topic Maps .....                                                                                               | 326        |
| <i>Arndt, H.-K. und Tietz, S.:</i><br>IT-Lösungen zur Freigabe und Dokumentation von Gefahrstoffen in einem Großunternehmen der<br>Automobilindustrie .....                                                                                      | 337        |
| <i>Bachmann, E.:</i><br>Product Compliance Business Network – Be connected with your business partner to increase<br>your product know-how .....                                                                                                 | 347        |
| <i>Joschko, P., Page, B., Schmitz, C. und Denz, N.:</i><br>Implementation eines Workflow-basierten IT-Assistenten für Anlagenbetreiber im europäischen<br>Emissionshandel .....                                                                  | 355        |
| <i>Kowalewski, B., Senn, A. und Jäger, A.:</i><br>GIS-basiertes Altlasteninformationssystem im Gesamtkontext eines Unternehmens .....                                                                                                            | 365        |

|                                                                                                                                                                                                         |            |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|
| <i>Möller, A.:</i><br>Software-Unterstützung für Routine im betrieblichen Umweltschutz .....                                                                                                            | 375        |
| <i>Personn, N., Krehahn, P., Ziep, T. und Wohlgemuth, V.:</i><br>Prototypische Umsetzung einer mobilen open-source Applikation zur Material Stream Mapping<br>Methode .....                             | 383        |
| <i>Zabel, M., Schiemann, L. und Wohlgemuth, V.:</i><br>RESEFI Netzwerk und internetbasierte Plattform zur Ressourceneffizienz als Lern- und<br>Anwendungsmittel .....                                   | 393        |
| <i>Boehnke, B. und Wohlgemuth, V.:</i><br>Transparenz schon im Planungsprozess schaffen durch Energie- und Stoffstrommanagement .....                                                                   | 402        |
| <i>Witte, S., Boehnke, B. und Wohlgemuth, V.:</i><br>Analyse der Materialströme einer idealisierten Automobillackiererei mit Hilfe eines<br>parametrisierten benutzergeführten Simulationsmodells ..... | 410        |
| <b>Environmental Information and Reporting Systems .....</b>                                                                                                                                            | <b>419</b> |
| <i>Feiden, K. und Kruse, F.:</i><br>The GS SOIL portal prototype and its integrated network .....                                                                                                       | 420        |
| <i>Fischer-Stabel, P., Mattern, M. und Schäfer, K.:</i><br>An Information Portal for the Research in Nature Reserves: The UNESCO MaB Biosphere<br>Reserve Bliesgau .....                                | 429        |
| <i>Giesen, N., Jürgens, P., Gómez, J.M. und Omumi, H.:</i><br>ProPlaNET – Web 2.0 based Sustainable Project Planning .....                                                                              | 436        |
| <i>Granke, O., Hosenfeld, F., Rinker, A., Schnack, K. und Mues, V.:</i><br>European Forest Monitoring Information System Data management for EU project FutMon .....                                    | 446        |
| <i>Knol, O.:</i><br>Successful Biodiversity Monitoring in the Netherlands: The Network Ecological Monitoring<br>(NEM) .....                                                                             | 457        |
| <i>Lukacs, G. und Kazakos, W.:</i><br>Semantic Search over Structured Environmental and Geographic Data .....                                                                                           | 462        |
| <i>Rüther, M., Fock, J. und Hübener, J.:</i><br>Linked Environment Data .....                                                                                                                           | 470        |
| <i>Süpke, D.:</i><br>Reference Architecture for Dialogue-Based Sustainability Reporting .....                                                                                                           | 480        |
| <i>Rudolf, H.:</i><br>Umweltschutz – Wasserrechte digital: Eine Datenbank-Applikation und ihre Komponenten .....                                                                                        | 488        |
| <i>Michels, H. und Mauè, P.:</i><br>Semantics for notifying events in the affecting environment .....                                                                                                   | 501        |

|                                                                                                                                                                                                                                                  |     |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|
| <i>Velthorst, A.H.:</i><br>Can changes in nitrogen deposition be detected in vegetation composition using Ellenberg indicator values? A study using ten years of data from the National Monitoring Network Flora for Environmental Quality ..... | 508 |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|

|                                                                                                                                                              |     |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|
| <i>Wondergem, J. und Klein, P.:</i><br>The Netherlands Environmental Data Compendium (EDC): Key factors for Communication of Environmental Information ..... | 513 |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|

## **Environmental Information Infrastructure ..... 517**

|                                                                                                                      |     |
|----------------------------------------------------------------------------------------------------------------------|-----|
| <i>Klenke, M., Kruse, F. und Schenk, F.:</i><br>OpenSearch - Simple formats to share environmental information ..... | 518 |
|----------------------------------------------------------------------------------------------------------------------|-----|

|                                                                                               |     |
|-----------------------------------------------------------------------------------------------|-----|
| <i>Schade, S. und Craglia, M.:</i><br>A Future Sensor Web for the Environment in Europe ..... | 529 |
|-----------------------------------------------------------------------------------------------|-----|

|                                                                                                                                                                                                                        |     |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|
| <i>Schenk, F., Kruse, F. und Klenke, M.:</i><br>From Simple Data Sources to a Complex Information System: Integrating Heterogeneous Data Models into an Information Infrastructure for the Public Administration ..... | 540 |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|

|                                                                                                                                                                 |     |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|
| <i>Schäffler, U., Moraru, D., Heier, C., Spies, K.-H. und Schilcher, M.:</i><br>Interpolation of Precipitation Sensor Measurements using OGC Web Services ..... | 549 |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|

|                                                                                                                          |     |
|--------------------------------------------------------------------------------------------------------------------------|-----|
| <i>Lukács, G. und Cseh, M.:</i><br>An Information Search and Filtering Engine for a Sustainable Consumption Portal ..... | 556 |
|--------------------------------------------------------------------------------------------------------------------------|-----|

## **Environmental Health, Quality of Life and Pollution Management ..... 563**

|                                                                                                                                                       |     |
|-------------------------------------------------------------------------------------------------------------------------------------------------------|-----|
| <i>Arndt, H.-K. und Tietz, S.:</i><br>IT-solutions for Occupational Safety and Health Management Systems: A Knowledge Management-based approach ..... | 564 |
|-------------------------------------------------------------------------------------------------------------------------------------------------------|-----|

|                                                                                                                   |     |
|-------------------------------------------------------------------------------------------------------------------|-----|
| <i>Clune, W.H.:</i><br>An Incentives-Based Analysis Of Pollution Prevention Regulation in The United States ..... | 574 |
|-------------------------------------------------------------------------------------------------------------------|-----|

|                                                                                                                                                                                             |     |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|
| <i>Armen, S., Lilit, S., Shushanik, A., Meline, A. und Vahagn, M.:</i><br>Development of remote sensing methods for assessment of heavy metal soil pollution near the city of Kajaran ..... | 582 |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|

|                                                                                                                                                                                                 |     |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|
| <i>Hearl, F., Tisdale-Pardi, J., Blosser, F., Lum, M., Sublet, V. und Howard, J.:</i><br>The NIOSH Science Blog: Social Media Dissemination of Occupational Safety and Health Information ..... | 589 |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|

|                                                                                                                                                                                  |     |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|
| <i>Lakes, T., Leser, U. und Senf, C.:</i><br>An urban health risk analysis for Berlin: exploration and integration of spatio-temporal information on the urban environment ..... | 593 |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|

|                                                                                                                                                       |     |
|-------------------------------------------------------------------------------------------------------------------------------------------------------|-----|
| <i>Thinh, N.X., Müller, B., Terne, F. und Holfeld, M.:</i><br>Methodology and application development for monitoring quality of life in Dresden ..... | 604 |
|-------------------------------------------------------------------------------------------------------------------------------------------------------|-----|

|                                                                                                                                                                                             |     |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|
| <i>Kusmierz, R., Voigt, K. und Scherb, H.:</i><br>Is the human sex odds at birth distorted in the vicinity of nuclear facilities (NF)? A preliminary<br>geo-spatial-temporal approach ..... | 616 |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|

## **Environmental Modelling and Simulation ..... 627**

|                                                                                                                                             |     |
|---------------------------------------------------------------------------------------------------------------------------------------------|-----|
| <i>Bauböck, R.:</i><br>BioSTAR: A simple crop model for the assessment of agricultural biomass potentials in Lower<br>Saxony, Germany ..... | 628 |
|---------------------------------------------------------------------------------------------------------------------------------------------|-----|

|                                                                                                                              |     |
|------------------------------------------------------------------------------------------------------------------------------|-----|
| <i>Caponigro, R. und Iannucci, C.:</i><br>Dynamical modeling for data collection and reporting: a system view of DPSIR ..... | 641 |
|------------------------------------------------------------------------------------------------------------------------------|-----|

|                                                                                                                                                                   |     |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|
| <i>Niklaus, M., Tum, M. und Günther, K.P.:</i><br>Modeling Carbon Sinks and Sources in semi-arid Environments for a Land Degradation<br>Assessment Approach ..... | 648 |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|

|                                                                                                                          |     |
|--------------------------------------------------------------------------------------------------------------------------|-----|
| <i>Rapp, B., Bremer, J. und Sonnenschein, M.:</i><br>Simulating the transport performance of online traded biomass ..... | 657 |
|--------------------------------------------------------------------------------------------------------------------------|-----|

|                                                                                                                                                   |     |
|---------------------------------------------------------------------------------------------------------------------------------------------------|-----|
| <i>Soukapavá, J. und Hřebíček, J.:</i><br>Environmental-Economic Modelling Municipal Solid Waste Management System of the Czech<br>Republic ..... | 667 |
|---------------------------------------------------------------------------------------------------------------------------------------------------|-----|

|                                                                                                                                                                                                                |     |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|
| <i>Theisselmann, F., Kühnlenz, F., Krüger, C., Fischer, J. und Lakes, T.:</i><br>How to reuse and modify an existing land use change model? Exploring the benefits of language-<br>centered tool support ..... | 678 |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|

|                                                                                                                                                                                   |     |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|
| <i>Tum, M., Niklaus, M., Günther, K.P. und Kappas, M.:</i><br>A new validation approach to assess the quality of modeled agricultural biomass potentials using<br>BETHY/DLR ..... | 689 |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|

## **Software Tools and Databases ..... 700**

|                                                                                                                            |     |
|----------------------------------------------------------------------------------------------------------------------------|-----|
| <i>Bock, M., Glowinski, R. und Voß, S.:</i><br>Entwicklung eines Artenkatasters für die Freie und Hansestadt Hamburg ..... | 701 |
|----------------------------------------------------------------------------------------------------------------------------|-----|

|                                                                                                                                |     |
|--------------------------------------------------------------------------------------------------------------------------------|-----|
| <i>Dick, M. und Naumann, S.:</i><br>Enhancing Software Engineering Processes towards Sustainable Software Product Design ..... | 706 |
|--------------------------------------------------------------------------------------------------------------------------------|-----|

|                                                                                                                                         |     |
|-----------------------------------------------------------------------------------------------------------------------------------------|-----|
| <i>Fischer, J., Naumann, S. und Dick, M.:</i><br>Enhancing Sustainability of the Software Life Cycle via a Generic Knowledge Base ..... | 716 |
|-----------------------------------------------------------------------------------------------------------------------------------------|-----|

|                                                                                                                                                                                           |     |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|
| <i>Epitropou, V., Karatzas, K. und Bassoukos, A.:</i><br>Open tools and services for INSPIRE related environmental data and metadata: reporting on<br>experiences gained in GS SOIL ..... | 726 |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|

|                                                                                                                 |     |
|-----------------------------------------------------------------------------------------------------------------|-----|
| <i>Lünsdorf, O. und Sonnenschein, M.:</i><br>A pooling based load shift strategy for household appliances ..... | 734 |
|-----------------------------------------------------------------------------------------------------------------|-----|

*Waldvogel, B., Wotruba, L., Müller, K. und Bischof, S.:*  
Drowning in Geospatial Point Data: A Pattern Based Approach .....744

*Zapico, J.L., Turpeinen, M. und Brandt, N.:*  
Greenalytics: a tool for mash-up life cycle assessment of websites .....754

**Author Index ..... 764**