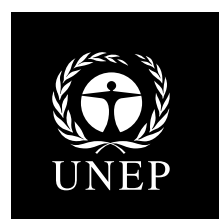




A Snapshot of the World's Water Quality: Towards a global assessment

A Snapshot of the World's Water Quality:
Towards a global assessment



Copyright © 2016, United Nations Environment Programme (UNEP)

ISBN Number: 978-92-807-3555-0

Job Number: DEW/1975/NA

Disclaimers

The designations employed and the presentation of material in this publication do not imply the expression of any opinion whatsoever on the part of UNEP concerning the legal status of any country, territory or city or its authorities, or concerning the delimitation of its frontiers or boundaries. For general guidance on matters relating to the use of maps in publications please go to: <http://www.un.org/Depts/Cartographic/english/htmain.htm>

Mention of a commercial company or product in this publication does not imply endorsement by the United Nations Environment Programme.

Reproduction

This publication may be reproduced in whole or in part and in any form for educational or non-profit services without special permission from the copyright holder, provided acknowledgement of the source is made. UNEP would appreciate receiving a copy of any publication that uses this publication as a source.

No use of this publication may be made for resale or any other commercial purpose whatsoever without prior permission in writing from the United Nations Environment Programme. Applications for such permission, with a statement of the purpose and extent of the reproduction, should be addressed to the Director, DCPI, UNEP, P.O. Box 30552, Nairobi, 00100, Kenya.

The use of information from this publication concerning proprietary products for publicity or advertising is not permitted.

Suggested Citation

UNEP 2016. A Snapshot of the World's Water Quality: Towards a global assessment. United Nations Environment Programme, Nairobi, Kenya. 162pp

Cover Design

Audrey Ringler UNEP

Design & Layout

Audrey Ringler UNEP & **Ogarit Uhlmann** F&U confirm, Leipzig

Credits

© Maps, photos, and illustrations as specified.

Cover image front: iStock photo ID:23936695 **Bartosz Hadyniak**

Cover image back: iStock photo ID:49215240 **Ilona Budzbon**

This report in the form of PDF can be viewed and downloaded at <http://www.unep.org/publications/>

UNEP promotes environmentally sound practices globally and in its own activities. This report is printed on paper from sustainable forests including recycled fibre. The paper is chlorine free and the inks vegetable-based. Our distribution policy aims to reduce UNEP's carbon footprint.

Acknowledgements

UNEP Coordination

Hartwig Kremer, Norberto Fernandez (until 2013), **Patrick Mmayi, Keith Alverson & Thomas Chiramba** (until 2015)

Project Coordination

Dietrich Borchardt & Ilona Bärlund Department of Aquatic Ecosystem Analysis, Helmholtz Centre for Environmental Research – UFZ

Chief Editor

Joseph Alcamo Center for Environmental Systems Research (CESR), University of Kassel

Scientific Editors

Joseph Alcamo Center for Environmental Systems Research (CESR), University of Kassel & **Dietrich Borchardt** Department of Aquatic Ecosystem Analysis, Helmholtz Centre for Environmental Research – UFZ

Technical Editor

Ilona Bärlund Department of Aquatic Ecosystem Analysis, Helmholtz Centre for Environmental Research – UFZ

Contributing Authors

Chapter 1

Deborah V. Chapman UNEP GEMS/Water Capacity Development Centre, Environmental Research Institute, University College Cork

Joseph Alcamo Center for Environmental Systems Research (CESR), University of Kassel

Chapter 2

Jeanette Völker, Désirée Dietrich & Dietrich Borchardt Department Aquatic Ecosystem Analysis, Helmholtz Centre for Environmental Research – UFZ

Philipp Saile UNEP GEMS/Water Data Centre, International Centre for Water Resources and Global Change, German Federal Institute of Hydrology

Angela Lausch Department Computational Landscape Ecology, Helmholtz Centre for Environmental Research – UFZ

Thomas Heege EOMAP GmbH & Co.KG

Chapter 3

Martina Flörke, Joseph Alcamo, Marcus Malsy, Klara Reder, Gabriel Fink & Julia Fink Center for Environmental Systems Research (CESR), University of Kassel

Jeanette Völker & Dietrich Borchardt Department of Aquatic Ecosystem Analysis, Helmholtz Centre for Environmental Research – UFZ

Karsten Rinke Department of Lake Research, Helmholtz Centre for Environmental Research – UFZ

Chapter 4

Ilona Bärlund Department Aquatic Ecosystem Analysis, Helmholtz Centre for Environmental Research – UFZ

Marcelo Pires da Costa National Water Agency of Brazil [Upper Tietê](#)

Prasad Modak Environmental Management Centre LLP, Mumbai [Godavari](#)

Adelina M. Mensah & Chris Gordon Institute for Environment and Sanitation Studies (IESS), University of Ghana [Volta](#)

Mukand S. Babel Water Engineering and Management, Asian Institute of Technology & **Pinida Leelapanang Kamphaengthong** Water Quality Management Bureau, Pollution Control Department, Ministry of Natural Resources and Environment, Thailand [Chao Phraya](#)

Chris Dickens International Water Management Institute (IWMI), South Africa [Vaal](#)

Seifeddine Jomaa Department of Aquatic Ecosystem Analysis, Helmholtz Centre for Environmental Research – UFZ **Sihem Benabdallah** Centre de Recherches et des Technologies des Eaux, Tunisia & **Khalifa Riahi** Laboratory of Chemistry and Water Quality, Department of Management and Environment, High Institute of Rural Engineering and Equipment, University of Jendouba [Medjerda](#)

Gregor Ollesch Elbe River Basin Community, Magdeburg [Elbe](#)

Dennis Swaney Department of Ecology & Evolutionary Biology, Cornell University **Karin Limburg** Department of Environmental and Forest Biology, State University of New York College of Environmental Science & Forestry & **Kevin Farrar** NY State Department of Environmental Conservation, Division of Environmental Remediation [Hudson](#)

Joseph Alcamo Center for Environmental Systems Research (CESR), University of Kassel

Chapter 5

Dietrich Borchardt Department Aquatic Ecosystem Analysis, Helmholtz Centre for Environmental Research – UFZ

Chris Gordon & Adelina M. Mensah Institute for Environment and Sanitation Studies, University of Ghana

Jesper Goodley Dannisøe DHI

Roland A. Müller Department of Environmental Biotechnology, Helmholtz Centre for Environmental Research – UFZ

Joseph Alcamo Center for Environmental Systems Research (CESR), University of Kassel

Advisory Committee, participants of two Advisory Committee meetings March 2014 & January 2015

AC1 & AC2

Mukand Babel Asian Institute of Technology

Peter Koefoed Bjørnsen UNEP-DHI, Denmark

Deborah V. Chapman UNEP GEMS/Water Capacity Development Centre, Environmental Research Institute, University College Cork

Johannes Cullmann UNESCO-IHP and German Federal Institute of Hydrology

Chris Dickens International Water Management Institute (IWMI), South Africa

Javier Mateo Sagasta Divina International Water Management Institute (IWMI) Sri Lanka

Sarantuyaa Zandaryaa UNESCO Division of Water Science

AC2 only

Marcelo Pires da Costa National Water Agency of Brazil

Sara Marjani Zadeh FAO

AC1 only

Fengting Li Tongji University, People's Republic of China

Monica Perreira Do Amaral Porto University of São Paulo

Julius Wellens-Mensah WMO Department of Climate and Water

Hua Xie International Food Policy Research Institute USA

Reviewers

Salif Diop Université CAD Dakar, Sénégal **Alan Jenkins** NERC-CEH, UK **Mick Wilson** UNEP Chief Scientist's Office **Hong Yang** Eawag, Switzerland

Sara Marjani Zadeh FAO **Javier Mateo Sagasta Divina** IWMI **Kate Medicott** WHO **Cecilia Scharp** UNICEF

Funding

The Government of Norway and the Government Canada through its Environment Canada as well as UN Water are gratefully acknowledged for providing the necessary funding that made the production of this publication "A Snapshot of the World's Water Quality: Towards a global assessment" possible.

For more information see: www.wwqa-documentation.info

Foreword: A Snapshot of the World's Water Quality “Towards a global assessment”

Flowing knowledge

The quality of surface water in many parts of the developed world has noticeably improved in recent decades, but is being challenged as economic growth, demographics and climate change lead to widespread and severe degradation. The need to reverse this damage is reflected in the 2030 Agenda for Sustainable Development, both as a dedicated goal and as an integral element of many others. By providing a snapshot of the current situation, this report offers a baseline to measure progress, a framework for global assessment and a pathway towards sustainable solutions that will deliver on that agenda.

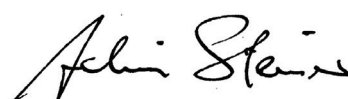
With many rivers still in good condition, there are opportunities to prevent pollution and begin restoration. However, severe organic pollution is already affecting around one in seven rivers across Latin America, Africa and Asia. This poses a growing risk to public health, food security and the economy, while cultivating inequality by predominantly affecting the poor, women and children.

Freshwater systems in both developed and developing nations face growing pressure from the discharge of harmful chemicals, such as hormone disruptors. Unfortunately, municipal water treatment has become increasingly costly and developing countries in particular have problems matching expanding public water supplies and sewerage, with adequate treatment of the new wastewater flows. As a result, there is a

significant risk to vital activities like inland fishing, which accounts for some 60 million jobs and almost a third of fish harvested for human consumption.

Sound knowledge is critical to understanding the underlying causes and developing the evidence based policies to improve it, including source control, waste treatment, ecosystem management and new forms of local and global governance. Yet, until now, insufficient collection and evaluation of data has made it difficult to grasp the intensity and scope of deteriorating water quality. While an overview of the situation in the Southern Hemisphere already feeds into UNEP's Global Environment Outlook, this report clarifies methodology and priorities for data collection, gaps and scale. Focussing on key hot spots, it applies advanced modelling to existing information, which will assist countries looking to establish their own planning, monitoring and guidelines.

Thanks to support from UN Water and the many contributing authors, this report will help bridge the gap between water quality, the inclusive green economy and wider development issues. I hope that by combining such a global issue with local understanding, it will provide public and private sector decision makers a practical tool to deliver on all of the water related commitments for the 2030 Agenda.



Achim Steiner, United Nations Under-Secretary-General and UNEP Executive Director



Table of Contents

Acronyms	IX
Executive Summary in Arabic	XV
Executive Summary in Chinese	XXII
Executive Summary in English	XXVIII
Executive Summary in French	XXXV
Executive Summary in Russian	XLIII
Executive Summary in Spanish	LI
1 Introduction	3
2 State of observational knowledge	7
2.1 Why do we need global data?	7
2.2 What data are available from GEMS/Water?	8
2.2.1 GEMS/Water Programme and GEMStat	8
2.2.2 Review of data availability (status 2014)	8
2.3 Can data from the scientific literature help fill the data gap?	10
2.4 What is the potential of remote sensing?	11
2.5 How can more data be made available?	12
3 Water pollution on the global scale	15
3.1 Introduction: A combined data and modelling approach	15
3.2 Pathogen pollution and the health risk	17
3.2.1 What health risks are related to polluted water?	17
3.2.2 What is the level of pathogen pollution?	18
3.2.3 People at risk of pathogen river pollution	22
3.2.4 Sources of faecal coliform bacteria	22
3.3	25

预览已结束，完整报告链接和二维码如下：

https://www.yunbaogao.cn/report/index/report?reportId=5_15358

