

Freshwater Cyanobacteria Harmful Algal Blooms: Human drivers and climate change

Host : Chungnam National University *, UNESCO

Presenters

Dongil Seo(Chungnam National University, Korea, Republic of)

Sarantuyaa Zandaryaa(UNESCO-IHP, France)

Hans Paerl(University of North Carolina, USA)

Steve Chapra(Tufts University, USA)

Sandra Azevedo(Federal University of Rio de Janeiro, Brazil)

Description

Body

1) Short Description

UNESCO-IHP is planning to launch a policy brief on Algal Cyanobacteria Harmful Algal Blooms during XVII Congress and share information regarding the sources and management of the issue.

Cyanobacterial harmful algal blooms (CyanoHABs)—the excessive growth of toxic algae caused by nutrient enrichment in water bodies—are becoming an increasing global concern due to their potential threat to human health and aquatic ecosystems, water resource availability and usage, and economic impacts. Cyanotoxins produced by cyanobacteria species can cause acute and chronic illnesses in humans. The CyanoHABs also affect the aquatic ecosystem through cyanotoxins, depletion of dissolved oxygen and disturbance in the aquatic food web caused by an over-abundance of algae. Economic impacts related to HABs include loss of recreational and fisheries revenues, decreased property values, and increased drinking-water treatment costs. CyanoHABs have been reported worldwide, and have been implicated in human and animal illness and death in all countries for which data are available.

The UNESCO-IHP Technical Document in Hydrology '*CYANONET: A global network for Cyanobacterial bloom and toxin risk management: Initial situation assessment and recommendations*' (2005) has illustrated the global occurrence of CyanoHABs and cyanotoxins, but concluded that findings under-represented the scale of the problem. This results in the limitation or lacking of certain health effects and the risk management capability for various countries.

During the last 15 years, since the IHP report has been published, various advances in scientific research, detection technology, and management skills have been made making it possible to better understand and regulate CyanoHABs in freshwater. At the same time, natural freshwater environments have become increasingly vulnerable to CyanoHABs due to increases in nutrient loading from fertilizer use in agricultural areas, untreated municipal and industrial wastewater discharges and urban run-off, coupled with climate change impacts such as low water levels during droughts and water temperature changes.

Hence, there is a need for a global assessment of the extent, threats and impacts of CyanoHABs in freshwater. Such an assessment will be essential for defining research, management and policy priorities to address the global proliferation of CyanoHABs and to protect freshwater resources, water supplies, and aquatic ecosystems, as well as to restore affected water resources.

Climate change and other human drivers bring in a new perspective on cyanobacteria harmful algal blooms in freshwater by adding complexities in terms of both ever-growing cyanoHAB phenomena

around the world (in scale and frequency) and their human, ecological and economic impacts.

2) Objectives

To carry out a scoping assessment on “Cyanobacteria Harmful Algal Blooms in freshwater: Human drivers and climate change”, aimed at providing the state-of-the-art knowledge and research findings, building on the foundation of the IHP technical report of 2005 and expanding it to the current state of knowledge.

To develop recommendations on future research, management and policy priorities to address CyanoHAB in freshwater to protect freshwater resources, water supplies, and aquatic ecosystems, as well as to restore affected water resources, while taking into consideration climate change impacts and adaptation strategies.

3) Justifications

The Policy Brief is in the framework of the implementation of IHP-VIII Strategic Plan (2014-2021) – Theme 3 “Addressing Water Scarcity and Quality” and Focal Area 3.4 “Addressing water quality and pollution issues within an IWRM framework - improving legal, policy, institutional, and human capacity” and Focal Area 3.5 “Promoting innovative tools for safety of water supplies and controlling pollution”. In particular, it contributes to the Strategic Objectives: Assess the current knowledge base and information about water quality to establish management priorities.

4) Projected outcomes

The Policy Brief on “*Freshwater Cyanobacteria Harmful Algal Blooms: Human drivers and climate change*”, will contain policy recommendations on future research, management and policy strategies. It will be a concise publication (no longer than 20-30 pages) for policy makers, basin organizations, water professionals, environmental managers, and researchers.

UNESCO Member States will have improved technical and policy capabilities to prevent, manage and control CyanoHABs in freshwater environments, reduce their impacts on human health and aquatic ecosystems, prevent economic losses and ecological disruptions, and protect and ensure water supplies

5) Alignment with Congress

Internationally well-known experts on CyanoHAB are invited to contribute to the drafting of the policy brief.