Baltic Marine Environment Protection Commission

Second Meeting of the Working Group on Reduction of Pressures from the Baltic Sea Catchment Area
Tallinn, Estonia, 6-8 May 2015

PRESSURE 2-2015

Document title	Sea-based measures to reduce consequences of Eutrophication – Report from the seminar held on 12 February 2015 in Stockholm
Code	3.2-5
Category	INF
Agenda Item	3 – 2 Coordinated/joint actions to reduce nutrient inputs
Submission date	30.4.2015
Submitted by	Sweden
Reference	

Background

The eutrophic state of the Baltic Sea, with frequent blooms of cyanobacteria and extensive hypoxia, is the result of a century of excess nutrient inputs. Despite significant nutrient load reductions in recent decades, signs of improvement are few, at least in the open Baltic Proper. It has been shown that internal cycling of massive amounts of phosphorus accumulated in the Baltic Sea water column and sediments is contributing to the slow recovery.

Historically, major phosphorus input reductions have been achieved by the development of efficient sewage treatment. Although significant hot spots remain, in several countries further development will only give small additional reductions. While agricultural nutrient management gradually improves, even after implementation of measures on land it will be a challenge to achieve a Baltic Sea unaffected by eutrophication within the coming decades.

In the light of the deteriorated state and the expected long recovery time of the Baltic Sea, various actions have been proposed to combat eutrophication through measures taken directly in the sea. Imaginative engineering ideas flourished after the extensive hypoxia and cyanobacterial blooms in the early 2000s. Several, such as altering the circulation of the Baltic by changing the flow through the straits, have been shown to be unrealistic. However a few ideas for large scale engineering are still not proven impossible. In addition, smaller scale sea-based measures have been developed and tested in the past decade. In Sweden in particular, considerable research and innovation investments have been made to investigate the potential and feasibility of various direct sea-based measures to combat eutrophication. In general, the methods fall into three categories: 1) elimination of phosphorus leakage from the bottom sediment, 2) biomanipulation of the food web and 3) nutrient extraction from the sea.

On February 12, 2015 the seminar “Sea-based measures to reduce the effects of eutrophication” was arranged with the aims to review the experiences from recent projects and in light of these, to discuss opportunities and challenges associated with sea-based measures, with particular focus on the stakeholder side of the issue. Some of the proposed measures are under significant, and at times heated, scientific debate. However, the intention of this seminar was not to focus on the scientific challenges, but to illustrate possible methods that are being tested.

The seminar was jointly arranged by the Swedish Ministry of Environment, the Swedish Agency for Water and Marine Management (SWaM) and the Baltic Sea Centre and Baltic Nest Institute of Stockholm University. A clear division of responsibilities was made so that Stockholm University had responsibility for providing a

scientific background and perspective presentation, while SWaM and the Ministry were responsible for selecting and inviting relevant projects. Practical arrangements were made by Stockholm University.

The full program of the seminar is provided in Annex 1.

Minutes from the seminar presentations and the panel discussion, including all presentations, are available in the Meeting Document Library document provided in document 3.2-5-Att.

The seminar was video filmed and is available for watching at:

http://www.su.se/ostersjocentrum/baltic-eye/kan-vi-ge-östersjön-konstgjord-andning-1.224279

Action required

The Working Group is invited to take note of the information and disseminate this to appropriate stakeholders.

Annex 1 Seminar Programme

Seminar Program

The seminar aims to give a scientific background to the influence of eutrophication on nutrient cycling and present pilot projects to discuss the potential of these as complementary solutions for combating eutrophication in the Baltic Sea.

9.00 – 09.30 Coffee and sandwich

09.30 – 09.40 Welcome address, **Stefan Berggren** Swedish Ministry of the Environment and **Tina Elfwing** Stockholm University Baltic Sea Centre

09.40 – 10.20 Scientific background to Baltic Sea Eutrophication, **Bo Gustafsson** Baltic Nest Institute

10.40 – 12.00 Presentations of projects
Emil Rydin and Linda Kumblad Baltic Sea 2020
»Anoxic sediments bind phosphorous after Al-treatment.«
Anders Stigebrandt Gothenburg University
»Oxygenation of anoxic bottoms as a method to decrease the internal P-load and the eutrophication of the Baltic Proper«
Bengt Simonsson, Teknikmarknad
»Removing eutrophication-causing sediment top layer from seabed, converting it to valuable raw materials"
Sven Blomqvist, Stockholm University
»Enhanced inactivation of P in Baltic sediments by addition of marl"

12.00-12:45 Lunchbreak

12:45-13.45 Short parallel presentations
A. **Dennis Wiström**, Västervik Municipality
»Eutrophication as a resource - Restoration of a eutrophicated fjord through irrigation of crops with nutrient rich water«
B. **Matilda Gradin,** Trelleborg Municipality
»Nutrient recycling in agricultural landscapes via production wetlands, algae and biogas«
C. **Susanna Minnhagen,** Kalmar Municipality
»Large-scale feed-mussel farms to harvest nutrients from the sea"
D. **Jouni Lehtoranta and Heikki Pitkänen,** SYKE Finnish Environment Institute
"Benefits and disadvantages of artificial oxygenation under coastal marine conditions in the Baltic Sea"
E. **Sif Johansson,** EviEM The Mistra Council for Evidence-Based Environmental Management
»Can a reduction of zooplankton feeding fish improve water quality?«

13.50-14.10 Sea based methods in perspective, **Lena Viktorsson** Baltic Eye

14.30 -15.30 Panel discussion on potential, risks and the way forward
Maria Laamanen Finnish Ministry of the Environment, **Mikhail Durkin** Eco Balt, **Sif Johansson**, Enviem, **Pauli Merriman**, WWF and **Karl-Johan Lehtinen** NEFCO
Moderated by **Susanna Baltscheffsky**, Editor in Chief, Ny Teknik

15.30-15.45 Closing remarks and wrap up by **Thomas Johansson** Swedish Agency for Marine and Water Management

The seminar will be lead by **Christoph Humborg** from the Stockholm University Baltic Sea Centre.

Stockholm University

REGERINGSKANSLIET

Swedish Agency for Marine and Water Management

In collaboration between the Agency for Marine and Water Management; Stockholm Univesrsity Baltic Sea Centre and the Swedish Ministry of the Environment