

Algaline consortium 2004

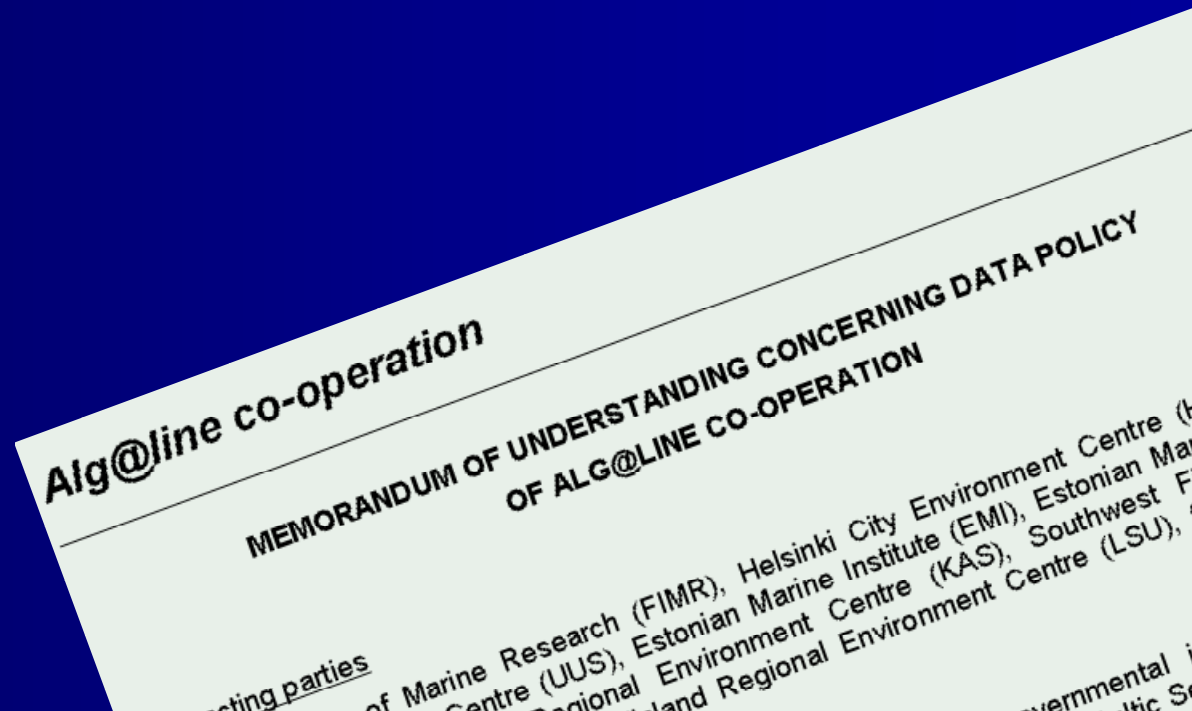
Mika Raateoja / Alg@line

Outlook to the past

- 1991: the first SOOP-measurements on-route Helsinki-Tallinn with Georg Ots
 - not fully operational yet...
- 1992: the system was installed on-board Finnjet
 - efficient data collection
- 1993: the "official" launch of Alg@line
 - Algal information service and dissemination
 - Network of institutes
- 1995: Alg@line goes into the internet
- 1997: Finnish-Estonian operative monitoring and information dissemination system of the state of the Gulf of Finland
 - Finnish Institute of Marine Research
 - Estonian Marine Institute
 - Uusimaa Regional Environment Centre
 - City of Helsinki Environment Centre

From the past to the present

- 2004: Memorandum of understanding concerning data policy of Alg@line co-operation
 1. The rights and responsibilities of the Alg@line parties
 2. The recommendations for Alg@line data management
 3. The Alg@line data policy against parties outside Alg@line



13 years of SOOP-activity

Georg Ots	1990-1991	Helsinki-Tallinn
Finnjet	1992-2004	Helsinki-Travemünde, Helsinki-Tallinn
Fennia	1992-1995	Kokkola-Vaasa-Jakobstad- Umeå-Skellefteå
Konstantin Simonov	1992-1995	Helsinki-St. Petersburg
Outokumpu	1997-1999	Kokkola-Rotterdam
Wasa Queen	1997-1999	Helsinki-Tallinn
Finnpartner	1998-current	Helsinki-Travemünde
Silja Serenade	1998-current	Helsinki-Mariehamn- Stockholm
Kristina Brahe	2003-current	Savonlinna-Vyborg-Kotka- Helsinki-Mariehamn
Silja Opera	2003-current	Helsinki-St. Petersburg, Helsinki-Tallinn-Riga, Helsinki-Mariehamn-Visby
Romantika	2004-current	Helsinki-Tallinn
Transguard	2004-current	Hamina-Lübeck
Merikarhu 1999-current	Telkkä 2001-current	Turva 2003-current

ALGALINE



Alg@line routes 2004

and:

- Transguard with its CPR from Hamina to Lübeck
- Merikarhu with its CTD, station LL7, Gulf of Finland

Alg@line partners

- Contracting parties: the Alg@line partners
 - Research institutes
 - Finnish Institute of Marine Research
 - Estonian Marine Institute
 - Estonian Maritime Academy
 - Finnish environmental administration
 - Uusimaa Regional Environment Centre
 - City of Helsinki Environment Centre
 - Southwest Finland Regional Environment Centre
 - West Finland Regional Environment Centre
 - Southeast Finland Regional Environment Centre
 - Finnish Environment Institute



Other Alg@line partners



Shipping companies (Finnlines, Kristina Cruises, Silja Line, Tallink, Transfennica)



Finnish Sea Scouts



Finnish Frontier Guard



FIMR: the SOOP-system on-board Finnpartner 2005

- On-the-run parameters
 - position and time
 - salinity (conductivity)
 - temperature
 - both inside the bubbling chamber and inside the pipe prior to the chamber ($\Delta\text{temp} \sim 0.5^\circ\text{C}$)
 - Aanderaa 3444, 3210, 3315
 - turbidity
 - Turner Designs SCUFA

FIMR: the SOOP-system on-board Finnpartner 2005

- On-the-run parameters
 - *in vivo* Chl *a* fluorescence
 - Ex 460 ± 30 nm, Em 685 ± 30 nm
 - Turner Designs SCUFA

 - *in vivo* phycocyanin fluorescence
 - Ex 630, Em 660nm, Ref >665 nm
 - Turner Designs 10-AU with phycocyanin optical kit

 - variable fluorescence parameters
 - Ex 470 ± 30 nm, Em 685 ± 20 nm, >665 nm
 - Chelsea Technologies Group Fastracka I
 - photosynthetic potential
 - light capture capacity



The system on-board Finnpartner

- Analytical determinations: core parameters
 - Chl *a*
 - algal taxonomy (semi-quantitative / quantitative)
 - nutrients (PO_4 , TOT-P, NO_3 , NH_4 , TOT-N, Si)
- Collaboration with research projects
 - CDOM \Rightarrow remote sensing algorithm development / data validation
 - P uptake potential and kinetics \Rightarrow cyanobacterial studies
 - APA alkaline phosphatase activity
 - ELF enzyme labelled fluorescence
- Frequency:
 - on-the-run observations: every 20 s, 150-200 m \Rightarrow 650'000 annually
 - bottle samples: 24 per transect \Rightarrow 700 annually

Alg@line MoU 2004

Alg@line co-operation

MEMORANDUM OF UNDERSTANDING CONCERNING DATA POLICY OF ALG@LINE CO-OPERATION

Contracting parties

Finnish Institute of Marine Research (FIMR), Helsinki City Environment Centre (HKI), Uusimaa Regional Environment Centre (UUS), Estonian Marine Institute (EMI), Estonian Maritime Academy (EMA), Southeast Finland Regional Environment Centre (KAS), Southwest Finland Regional Environment Centre (LOS), West Finland Regional Environment Centre (LSU), form the body of Alg@line co-operation.

Background

The Alg@line co-operation is a collaboration of various governmental institutes conducting unattended operational ship-of-opportunity (SOOP) monitoring in the Baltic Sea. The data collected within this collaboration forms a timely and extensive source of information on the past and current state of the Baltic Sea. It is used for both scientific and informing purposes. This memorandum of

Rights and responsibilities

- Every partner
 - has a ship/ships to maintain
 - is responsible for the quality and storage of data collected with its ship/ships
 - has full rights, not only to the "own" data, but to all the Alg@line data from all the ships

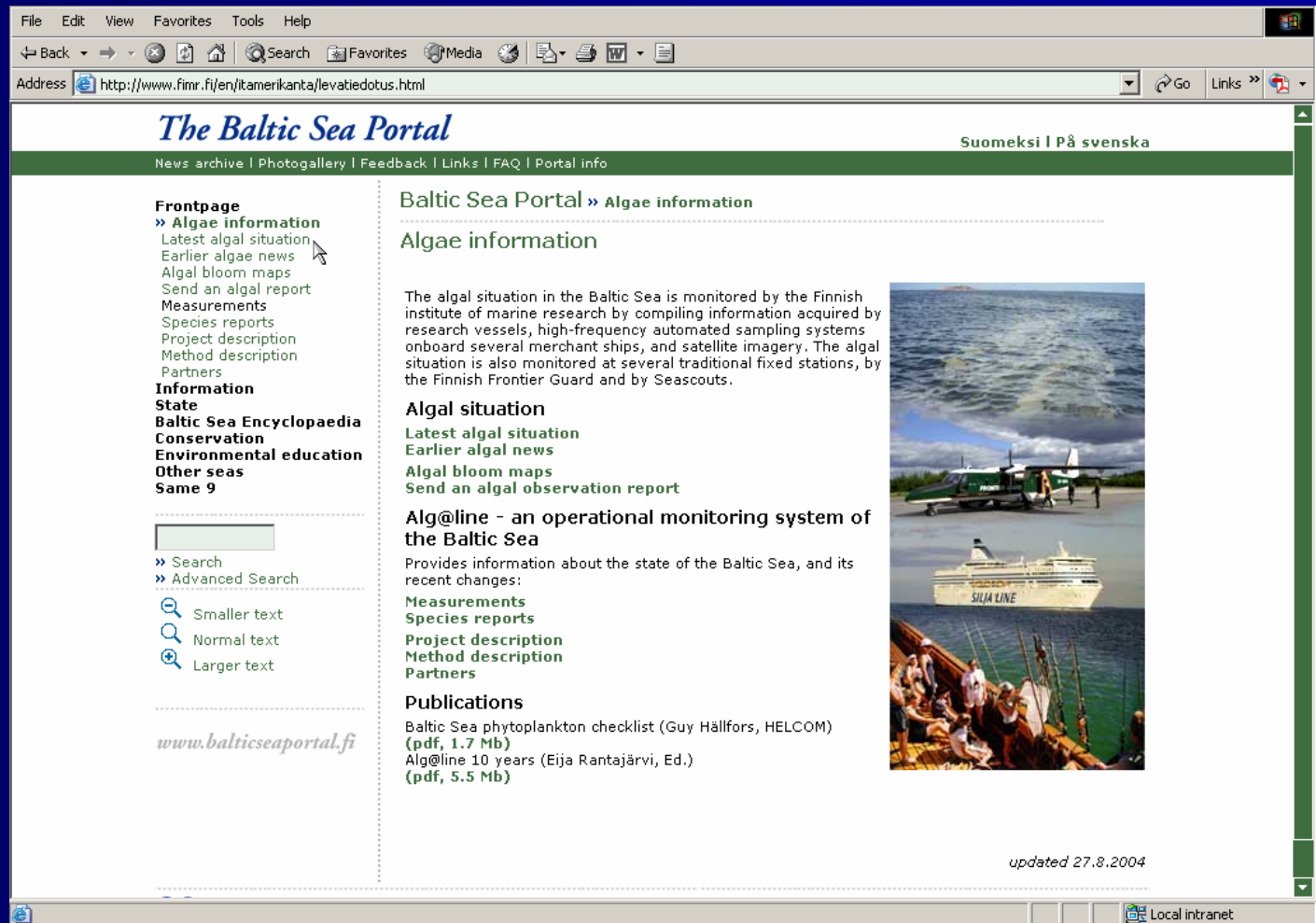
Data management

- Following items are instructed
 - data storage
 - directory structure
 - data filing
 - data back-up frequency
 - data quality check and labeling
 - 3 steps: bad, useful, good
 - Alg@base will improve the system
 - logbooks

Data policy for outsiders

- Data receiver
 - Instance, project, persons involved
 - purpose of data
- Policy: guidance for
 - data ownership
 - further data distribution
 - authorship, references
- Disclaimer
 - vertical limitation
 - areal limitation of bottle samples
 - taxonomic aspects
 - geographical projection
 - quality aspects: accredited methods

Alg@line information dissemination service



The screenshot shows a web browser window displaying the 'The Baltic Sea Portal' website. The browser's address bar shows the URL 'http://www.fimr.fi/en/itamerikanta/levatiedotus.html'. The website header includes the title 'The Baltic Sea Portal' and navigation links for 'Suomeksi' and 'På svenska'. Below the header, there are links for 'News archive', 'Photogallery', 'Feedback', 'Links', 'FAQ', and 'Portal info'. The main content area is divided into two columns. The left column contains a 'Frontpage' section with links to 'Algae information', 'Latest algal situation', 'Earlier algae news', 'Algal bloom maps', 'Send an algal report', 'Measurements', 'Species reports', 'Project description', 'Method description', and 'Partners'. Below this is an 'Information State' section with links to 'Baltic Sea Encyclopaedia', 'Conservation', 'Environmental education', 'Other seas', and 'Same 9'. A search box is also present with options for 'Search', 'Advanced Search', and text size adjustments. The right column features the 'Baltic Sea Portal > Algae information' section, which includes the title 'Algae information' and a paragraph describing the monitoring system. Below this is the 'Algal situation' section with links to 'Latest algal situation', 'Earlier algal news', 'Algal bloom maps', and 'Send an algal observation report'. The 'Alg@line - an operational monitoring system of the Baltic Sea' section provides information about the system and lists 'Measurements', 'Species reports', 'Project description', 'Method description', and 'Partners'. The 'Publications' section lists 'Baltic Sea phytoplankton checklist (Guy Hällfors, HELCOM) (pdf, 1.7 Mb)' and 'Alg@line 10 years (Eija Rantajärvi, Ed.) (pdf, 5.5 Mb)'. A photograph of a research vessel and a smaller boat is shown on the right. The footer includes the URL 'www.balticseaportal.fi' and the date 'updated 27.8.2004'. The browser's taskbar at the bottom shows 'Local intranet'.

File Edit View Favorites Tools Help

Back Forward Stop Home Search Favorites Media Print W

Address <http://www.fimr.fi/en/itamerikanta/levatiedotus.html> Go Links

The Baltic Sea Portal

Suomeksi | På svenska

News archive | Photogallery | Feedback | Links | FAQ | Portal info

Frontpage

- » **Algae information**
- Latest algal situation
- Earlier algae news
- Algal bloom maps
- Send an algal report
- Measurements
- Species reports
- Project description
- Method description
- Partners

Information State

- Baltic Sea Encyclopaedia
- Conservation
- Environmental education
- Other seas
- Same 9

Search

Advanced Search

- Smaller text
- Normal text
- Larger text

www.balticseaportal.fi

Baltic Sea Portal > Algae information

Algae information

The algal situation in the Baltic Sea is monitored by the Finnish institute of marine research by compiling information acquired by research vessels, high-frequency automated sampling systems onboard several merchant ships, and satellite imagery. The algal situation is also monitored at several traditional fixed stations, by the Finnish Frontier Guard and by Seascouts.

Algal situation

- Latest algal situation
- Earlier algal news
- Algal bloom maps
- Send an algal observation report


Alg@line - an operational monitoring system of the Baltic Sea

Provides information about the state of the Baltic Sea, and its recent changes:

- Measurements
- Species reports
- Project description
- Method description
- Partners

Publications

- Baltic Sea phytoplankton checklist (Guy Hällfors, HELCOM) (pdf, 1.7 Mb)
- Alg@line 10 years (Eija Rantajärvi, Ed.) (pdf, 5.5 Mb)



updated 27.8.2004

Local intranet

■ Near real-time information:

- latest algal situation and bloom forecasts
- latest SOOP-results from all the ships
- algal bloom maps
- algal species reports
- supporting information (project and method descriptions etc.)
- remote sensing products (operational in 2005)

Winds have dispersed the cyanobacterial surface accumulations

The recent strong winds have dispersed the blue-green algal surface biomasses into the water column. However, the cyanobacterial biomasses are still considerable.

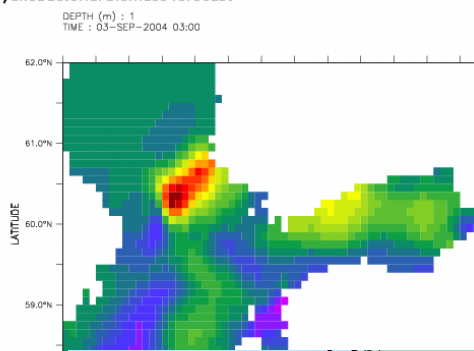
18.8.2004 / FIMR / Mika Raateoja and Seija Hällfors

Algal situation. Currently no extensive cyanobacterial surface accumulations exist in the Finnish sea areas. The cyanobacteria are still quite high, though, and new surface accumulations may form anywhere in the Gulf of Finland, in the Archipelago Sea, or in areas surrounding Åland in case the winds calm down.

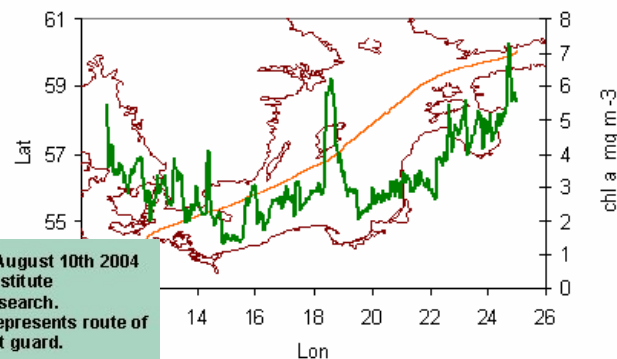
The cyanobacterial bloom situation is only seemingly improved, and the algal information service advises people to monitor the water in case of the presence of cyanobacteria. Especially important is to keep in mind that the absence of the surface accumulations does not in itself decrease the amount of cyanobacteria in the water, and hence their toxic effect. All blue-green algal blooms should be treated as if they were toxic. Water containing blue-green algae should never be used for washing, throwing on the sauna stove or for watering vegetables intended for human consumption. Boiling will not neutralise cyanobacterial toxins. During strong algal blooms, neither children nor pets should be allowed to go to the beach.

Forecast. The FIMR ecosystem model, which covers a period slightly over two days, predicted on 18.8.2004 that cyanobacterial biomasses in the surface layer throughout the Gulf of Finland are predicted to drift mainly towards East to South East. This means that the cyanobacterial biomasses will be more concentrated in the Gulf of Finland than in the Archipelago Sea. In the Archipelago Sea, the dominant wave direction affect the direction in which

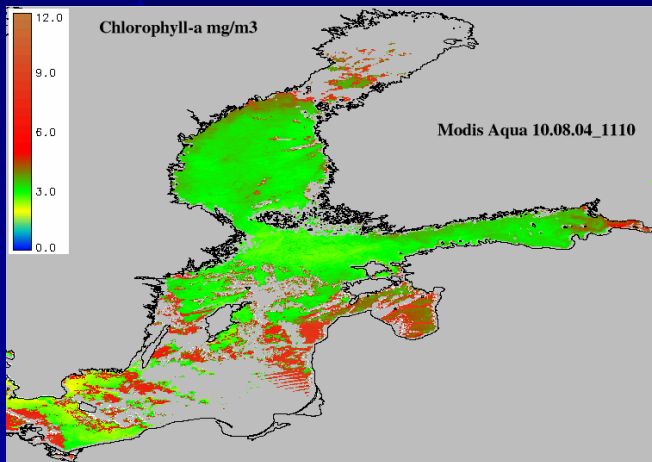
Cyanobacterial biomass forecast



Finnpartner 24th - 26th August 2004

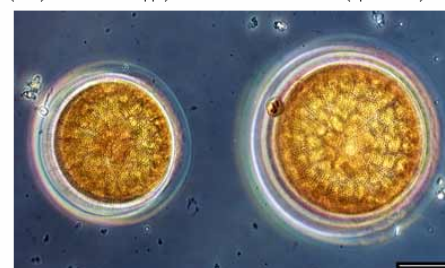


Updated on August 10th 2004 by Finnish Institute of Marine Research. Dotted line represents route of Finnish coast guard.



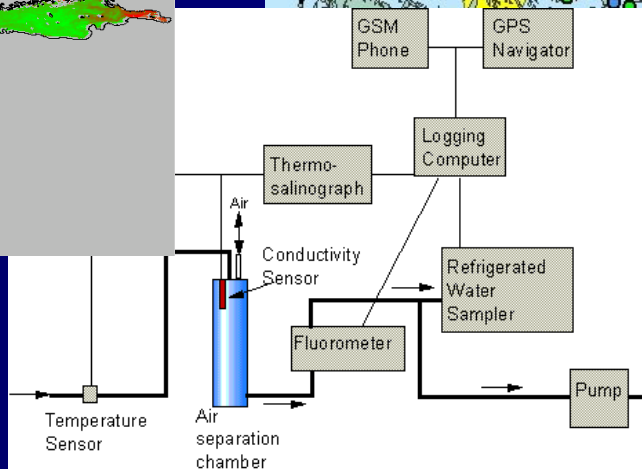
Phytoplankton in the Arkona Sea 17.8.2004

The filamentous blue-green algae *Nodularia spumigena** and *Aphanizomenon flos-aquae* and the diatoms *Cyclotella choctawhatcheeana*, *Nitzschia paleacea* and *Cylindrotheca closterium* are now relatively common. Other diatoms *Coscinodiscus granii*, *Chaetoceros impressus*, *C. thronsdeni*, *C. tenuissimus* and *Actinocyclus octonarius* occur in smaller numbers. However, nanoflagellates (*Chrysochromulina* spp.) dominate in cell numbers. (*potentially harmful species)



Two cells of the diatom *Coscinodiscus granii*. Scale bar 30 µm. Photo Seija Hällfors.

- 5 dominant taxa:
- Chrysochromulina** spp.
 - Plagioselmis prolunga*
 - Nodularia spumigena**
 - Aphanizomenon flos-aquae*
 - Cylindrotheca closterium*



■ In the Baltic Sea Portal

- information about:

- the Baltic Sea in general
- the state of its environment
- the recent development

AVERAGE SURFACE SALINITIES (PSU) IN THE BALTIC SEA



The annual zooplankton cycle

Species composition and abundances of the zooplankton community in the Baltic Sea change with the seasons. During winter darkness, cold water and ice cover decrease primary production rates and biomass of phytoplankton in water masses. As phytoplankton is ultimately the primary food source of zooplankton there is much less animals present in the plankton during winter than during summer months. During spring solar radiation increases, the ice cover melts and water is rich in nutrients. These factors launch a rapid increase in photosynthetic activity and growth of the phytoplankton biomass called the spring bloom. Zooplankton take advantage of the abundant food and a peak in zooplankton abundance follows the spring bloom with a small delay.

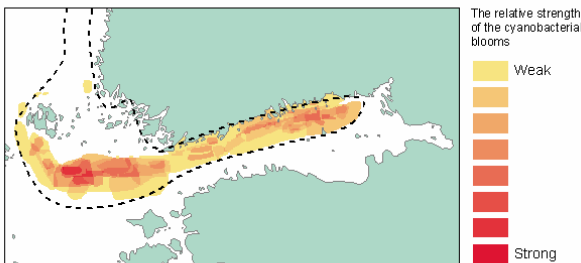


Copepod from genus *Heterocope*.

Blue-green algal blooms in the Baltic Sea in 2003 Updated 15.10.2003.

The intensity of the cyanobacterial blooms of the summer of 2003 in the Finnish sea areas turned out to be lower than expected and weaker than in previous years. The initial levels of surface water phosphate phosphorus were high in the beginning of the summer, thus indicating a high growth potential for cyanobacteria. However, although the summer period was quite warm, extensive cyanobacterial surface accumulations occurred only during the latter part of July.

CYANOBACTERIAL BLOOMS IN THE GULF OF FINLAND IN THE SUMMER OF 2003 (June 1 - August 31)



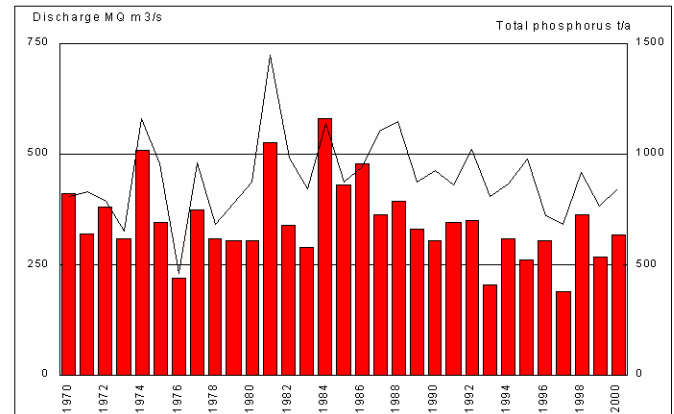
The strength of the cyanobacterial blooms observed is affected by the number and the intensity (from visible to dense) of the blooms. The data is based mainly on the observations made by the pilots of the Finnish Frontier Guard (the observation area is marked with a dashed line).

Summer is the high season for zooplankton: growth is fast and generation cycles are short due to warm waters and abundant food. The zooplankton biomass reaches its peak during late summer and autumn months when the waters are still warm. During the same time the predation pressure is stronger as larger animals feeding on zooplankton like fish, such as Baltic herring and sprat, as well as predators, reaches its peak. During September-October zooplankton abundances decrease both due to lower reproduction rates and predation.

Some crustacean species have different strategies for surviving the winter. Copepods form dormant stages or eggs (ephippia) settling to the bottom sediment overwinter as adults or juveniles. Increase in solar radiation and water temperature leads to a hatching of the dormant stages or fertilized eggs and reproduction and growth of the phytoplankton spring bloom.

Key zooplankton in the northern Baltic Sea are: Copepods of the northern Baltic Sea and Cladocera of the northern Baltic Sea.

Riverine total phosphorus load (Finland) into the Gulf of Finland in 1970-2000



Riverine total phosphorus load (Finland) into the Gulf of Finland. Source: Finnish Environment Institute