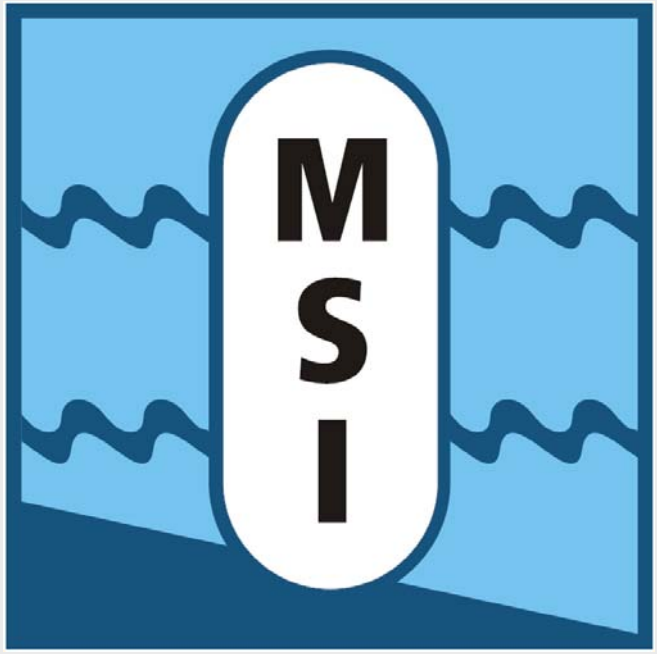
Marine Systems Institute

at Tallinn University of Technology

Founded 2002, groups active since mid-1960-s

Staff: > 50, PhD 20



Former structures

1965-1972:
working group at TUT Sanitary Engineering Laboratory

1972-1990:
Baltic Sea Department, TA Institute of Thermophysics and Electrophysics

1990-1992:
Marine Physics Department, TA Institute of Ecology and Marine Research

1992-2002:
Marine Physics Department, Estonian Marine Institute

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TALLINN UNIVERSITY OF TECHNOLOGY

Marine Systems Insitute

Structure

Administration (Director: Jüri Elken)

Research Units

- **Department of Marine Physics (Head: Urmas Lips)**
- **Department of Modeling and Remote Sensing (Head: Urmas Raudsepp)**
- **Laboratory of Marine Ecology (Head: Inga Lips)**

Teaching Unit

- **Chair of Oceanography (Head: Sirje Keevallik)**

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Research

Basic research: Baltic Sea water and matter exchange processes

- basin-wide and coastal-offshore exchange processes in the NE water cycle loop;
- atmosphere-ocean interaction and marine forecasts;
- dynamics of coastal system, including suspended matter;
- processes controlling the estuarine pelagic ecosystem response.

Applied research:

- operational oceanography (high-res observing systems, forecast models) ← GMES, EuroGOOS, BOOS, FerryBox etc
- marine environmental monitoring
- impact studies ← industry
- observation technology

Funding Structure:	**Governmental, incl. grants**	**45 %**
(> 1 MEUR)	**Research contracts**	**35 %**
	International	**20 %**

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Marine Systems Insitute

Education

Curricula in Earth Sciences **Faculty of Science**
Marine Systems Institute jointly with Institute of Geology

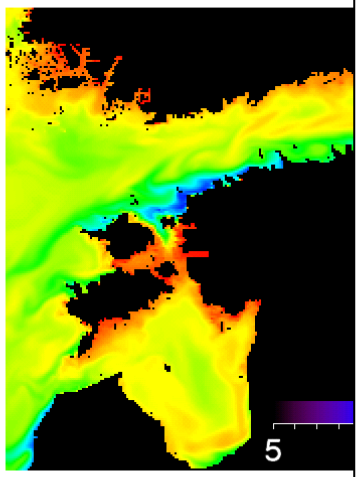
Bachelor Studies
Master Studies
PhD Studies

Specializations
Geology
Oceanography and Meteorology

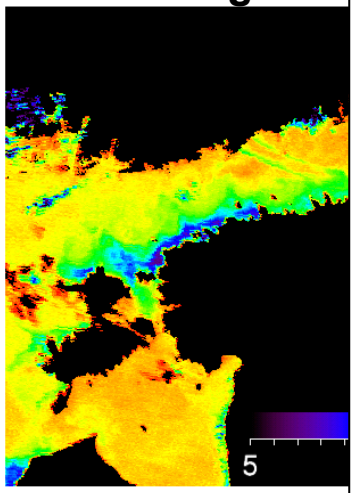
Master Students	**(2 years)**	**ca 30**
PhD Students	**(4 years)**	**ca 20**

Upwelling effects on the nutrient cycle

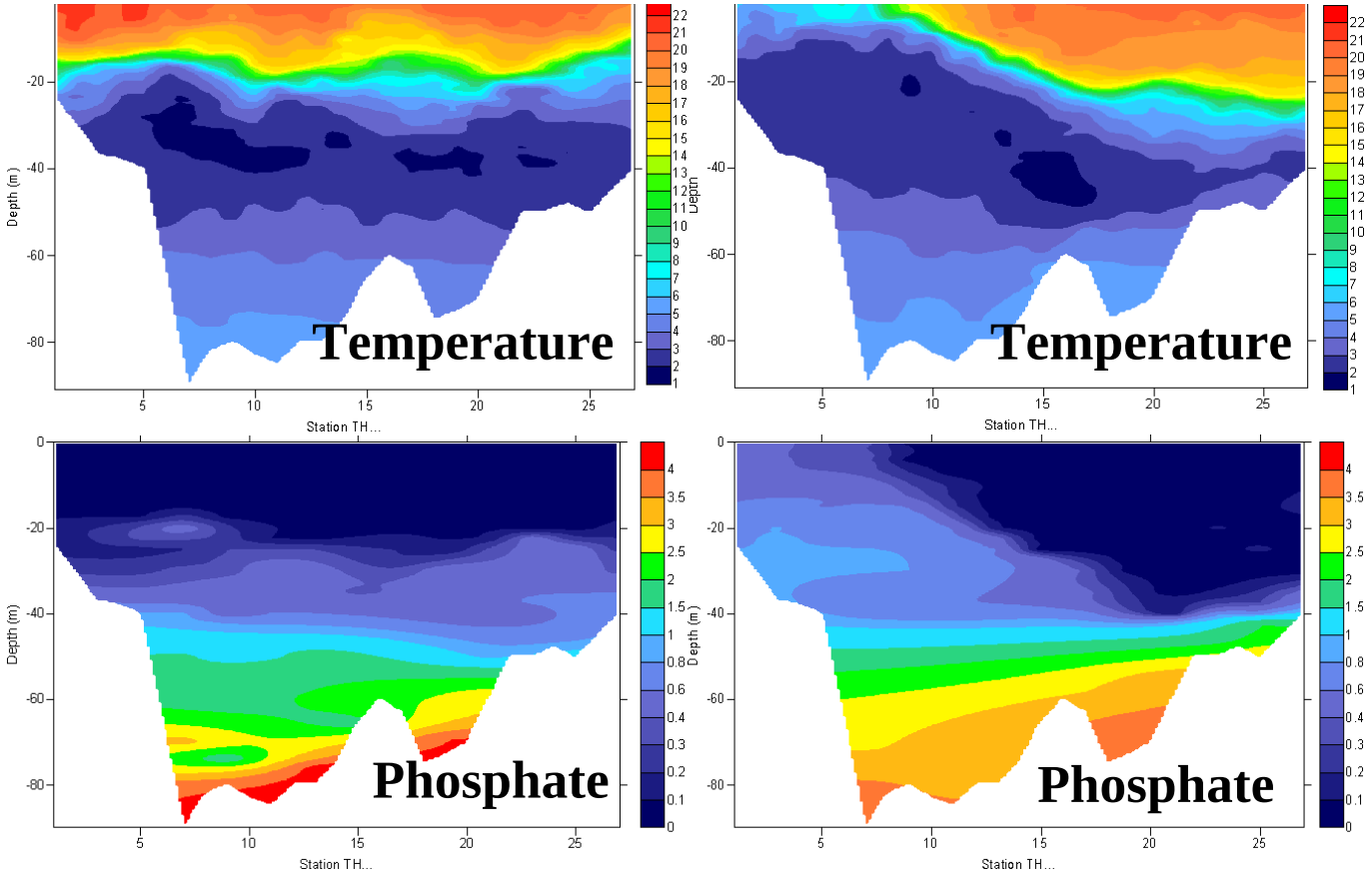
HIROMB model f



MODIS image



Before upwelling 11.07.2006 **During upwelling 8.08.2006**

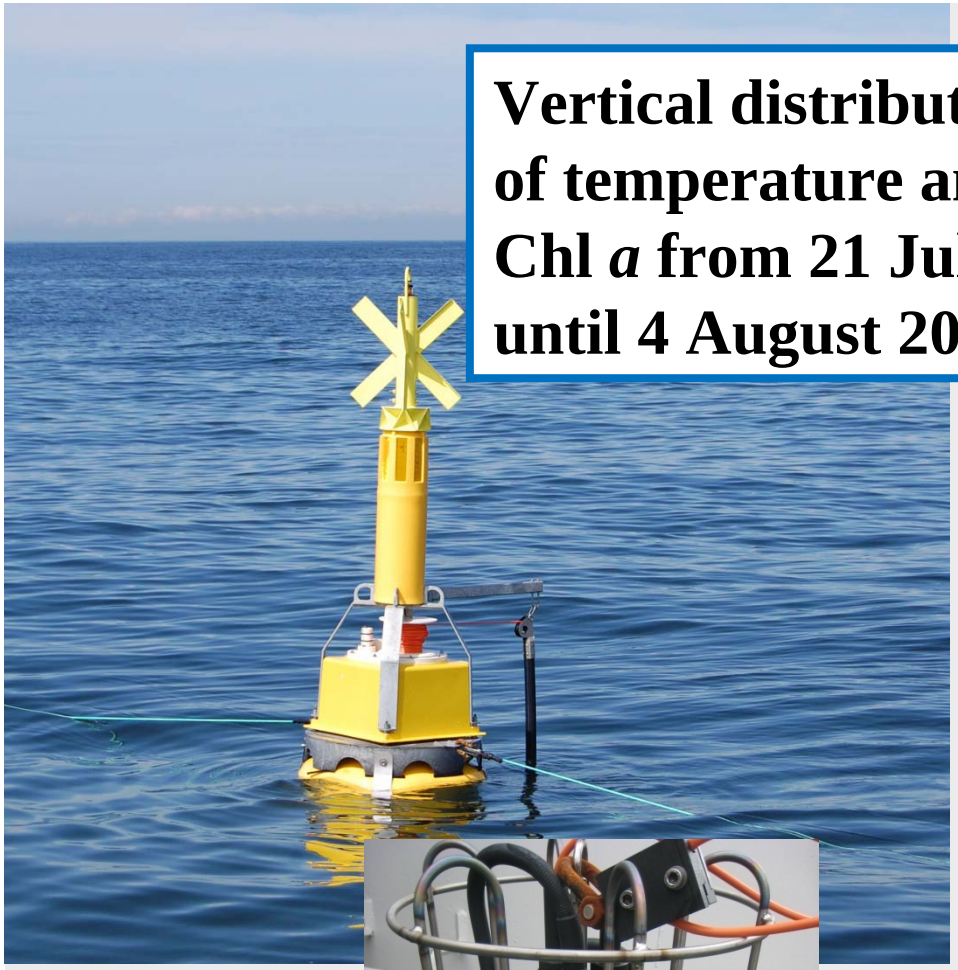


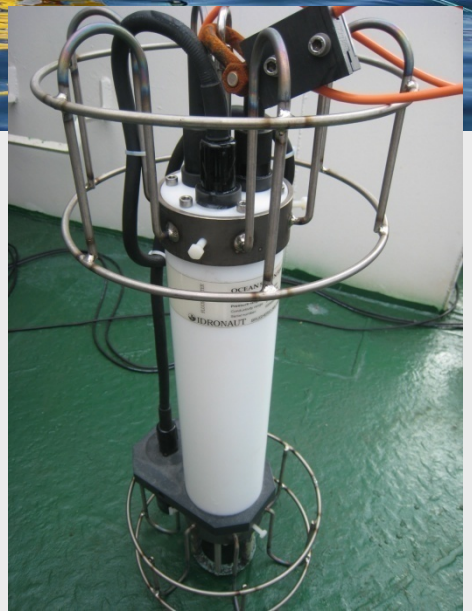
0,3-0,4 µmol/l – 20 m layer – 20 km coastal zone – 100 km long

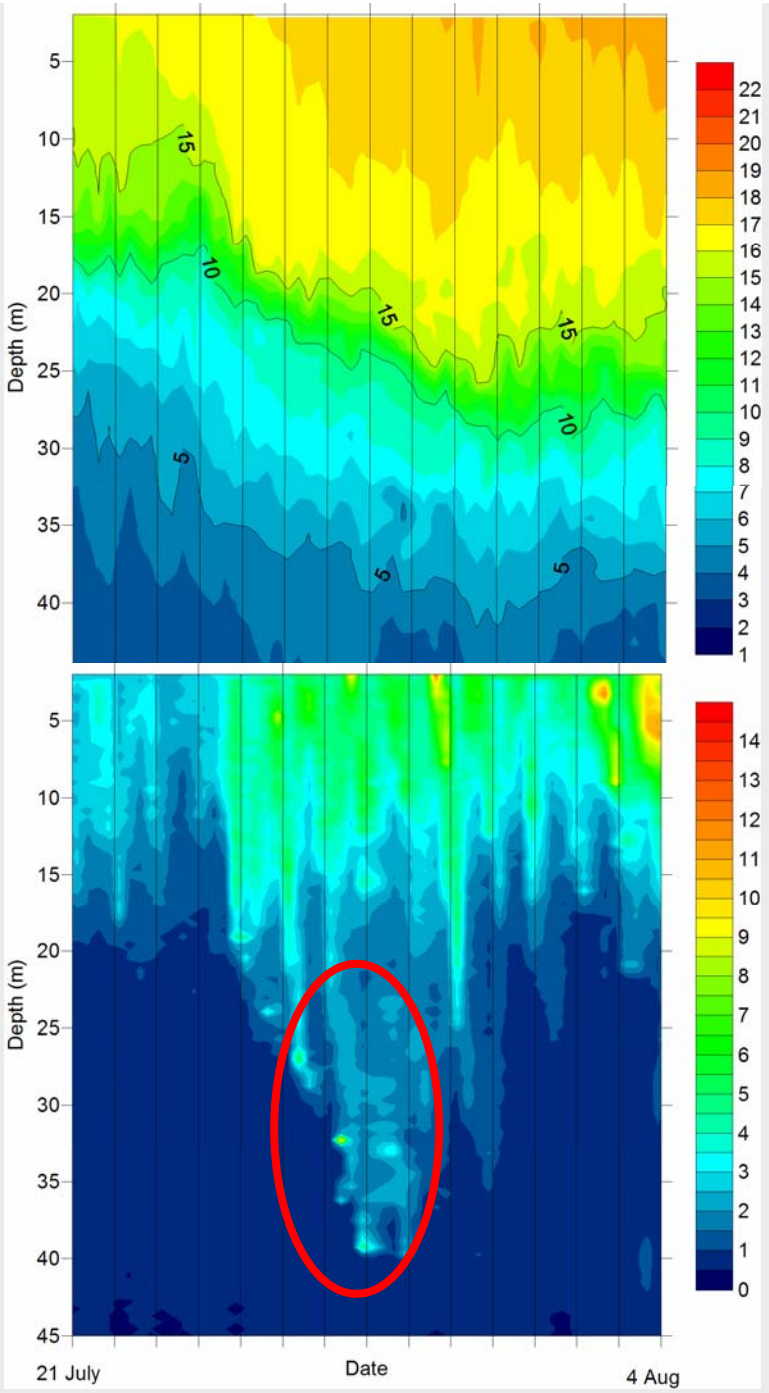
Vertical flux estimate – 400-600 tons of P, equals to ca 1 month riverine load

Urmas Lips

Vertical distribution of temperature and Chl *a* from 21 July until 4 August 2009

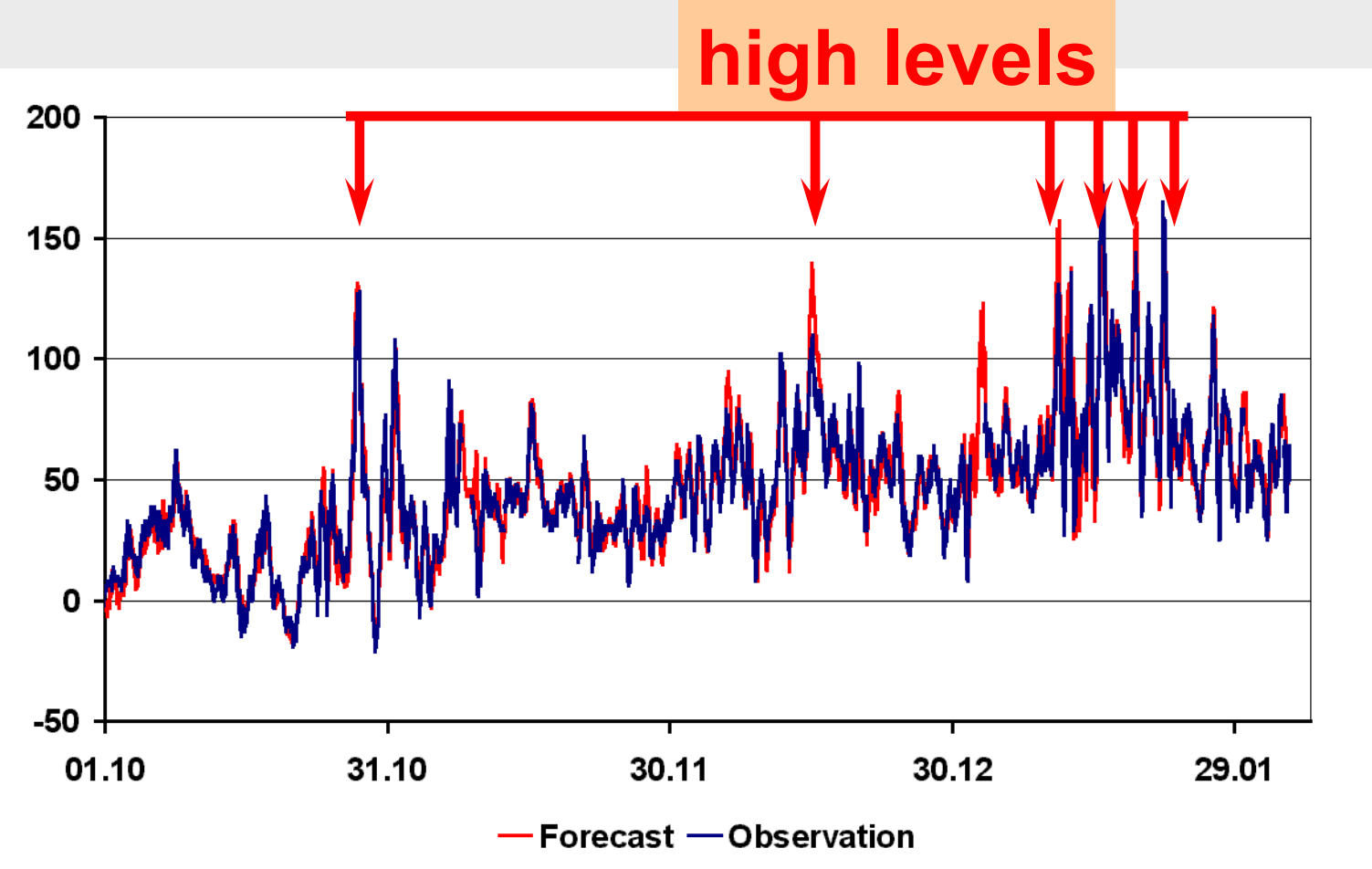






Operational oceanography in practice

Observed and 24h forecasted sea levels (cm) in Pärnu
during the stormy period from 01.10.2006 to 03.02.2007



24/7 operational services

Sea level

Online observations and forecast

Offshore meteorology

Online observations at Tallinnamadal Lighthouse

FerryBox TS, Chl, nutrients etc

Daily Tallinn-Helsinki tracks

Drifters

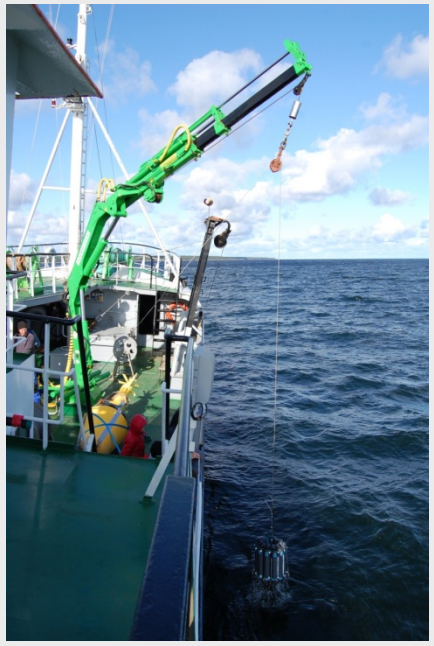
Online ice drifters (project dependent)

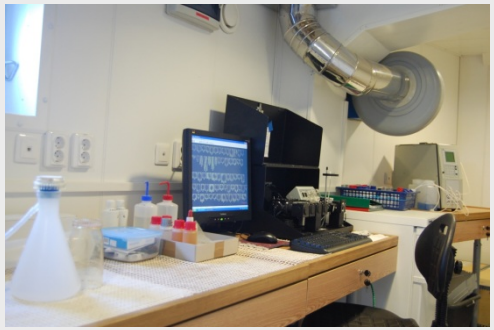
Currently: Gulf of Finland (SAFEWIN)

Gulf of Riga

EAS infrastructure investment project "Observatory for Coastal Zone Environment"

Research Vessel SALME **32 m length, 202 GRT**
first expeditions in 2007, rebuilt in 2009





New instruments for: **laboratories**
field work

Partners:
TUT Institute of Geology
TUT Marine Systems Institute
Department of Environmental Engineering

Ongoing larger international projects

BalticSeaNow.info - Innovative participatory forum for the Baltic Sea

SNOOP - Shipping-induced NOx and SOx emissions - operational monitoring network

SAFEWIN - Safety of Winter Navigation in Dynamic Ice

EuroFLEETS - Towards an Alliance of European Research Fleets

ECOSUPPORT - Advanced tool for scenarios of the Baltic Sea ECOsystem to SUPPORT decision making

MyOcean - Development and pre-operational validation of upgraded GMES Marine Core Services and capabilities

ECOOP - European Coastal Sea Operational Observing and Forecasting System

SEADATANET - Pan-European Infrastructure for Ocean & Marine Data Management

GORWIND - The Gulf of Riga as a Resource for Wind Energy

GES-REG - Good environmental status through regional coordination and capacity building

NAVIGATE - Advanced wave forecast for safe navigation of small vessels