



VALDKONDLIKU TEADUS- JA ARENDUSTEGEVUSE TUGEVDAMISE
PROGRAMMI (RITA) TEGEVUSE 1 „STRATEEGILISE TA TEGEVUSE
TOETAMINE“

Innovative approaches to monitoring and assessing marine environment and nature values in Estonian sea area

project presentation

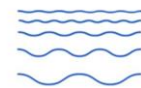


Euroopa Liit
Euroopa
Regionaalarengu Fond



Eesti
tuleviku heaks

Georg Martin



mereRITA



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Eesti Maaülikool
Estonian University of Life Sciences

**TAL
TECH**





EMI MB	EMI KA	EMI OP	GI	MSI	EMÜ
Georg Martin	Markus Vetemaa	Tiit Kutser	Atko Heinsalu	Urmas Lips	Anti Vasemägi
Kaire Torn	Mehis Rohtla	Birgot Paavel	Aivo Lepland	Inga Lips	Riho Gross
Jonne Kotta	Anu Albert	Ele Vahtmäe	Siim Veski	Taavi Liblik	Veljo Kisand
Kiran Liversage	Roland Svirgsden	Tuuli Soomets	Tiiu Alliksaar	Irina Suhhova	Kerli Haugjärv
Kristjan Herkül	Lagle Matetski	Laura Lõugas	Vladimir Karpin	Stella-Theresa Stoicescu	Kristel Panksep
Tiina Paalme	Kristiina Hommik	Sijia Li	Merlin Liiv	Silvie Lainela	
Helen Orav-Kotta	Kristi Källo		Anett Poolma	Kai Salm	
Kaire Kaljurand				Oliver Samlas	
Gerli Albert					
Liis Rostin					

43 scientists

Budget

		PI salaries	other salaries	travel	events	equipment	subcontrac	other	OH	VAT	total
EMI MB	RITA1/02-60-01	192706	49142.5	4092	3000	0	0	8000	36277.29	58643.57	351861.4
EMI KA	RITA1/02-60-07	104109	15172.3	9000	0	0	5000	5000	17892.15	31234.69	187408.1
EMI OP	RITA1/02-60-02	60926	0	3824	0	0	0	0	9138.9	14777.78	88666.68
EMÜ	RITA1/02-60-05	4845	52884	2000	0	0	0	16000	8660	16877	101266
MSI	RITA1/02-60-03	52000	20000	2000	0	0	0	38300	10800	24620	147720
GI	RITA1/02-60-04	44500	1800	1000	0	0	4000	460.88	6945	11741.18	70447.06
	SUM	459086	138998.8	21916	3000	0	9000	67760.88	89713.34	157894.2	947369.2

Project: “Innovative approaches to monitoring and assessing marine environment and nature values in Estonian sea area”

WP1: PROJECT MANAGEMENT (G. Martin)

WP2: INNOVATIVE TECHNOLOGICAL SOLUTIONS (U. Lips)

WP3: MARINE NATURE ASSETS AND THEIR STATUS IN THE PILOT AREAS (T. Paalme)

WP4: CUMULATIVE IMPACTS OF HUMAN PRESSURES ON MARINE NATURE ASSETS (J. Kotta)

HABITATS

- 2.1. From autonomous high-frequency observations to spatial assessments (U. Lips)
- 2.2. Improving remote sensing algorithms for deep parts of the Baltic Sea (T. Kutser)
- 2.3. Optical and acoustic remote sensing and in situ sampling for mapping seabed habitats (K. Herkül)
- 2.4 Applicability of eDNA based methodology for early detection of alien (cryptic) species (A. Vasemägi)

- 3.1. Assessment system of the habitat condition and extent in the Estonian marine area (K. Torn)
- 3.2. Testing methodology and identification of the status of benthic habitats in the pilot area (T. Paalme)
- 3.3. Mapping of occurrence of non-indigenous species (H. Orav-Kotta)

- 4.1. Establishing methodological framework to assess cumulative impacts of anthropogenic pressures on nature assets (K. Liversage)
- 4.2. Building algorithms to quantify cumulative impacts of anthropogenic pressures on nature assets in the pilot areas (J. Kotta)

SPAWNING GROUNDS

- 2.5. Otolith microchemistry methods to study fish recruitment (M. Rohtla)
- 2.6. Remote sensing of shallow coastal areas for assessing spawning conditions (M. Vetemaa)
- 2.7. Development of DNA-based approach for estimation of effective spawner abundance (A. Vasemägi)

- 3.4. Assessing the state of fish spawning grounds (M. Rohtla)

- 4.3. Modelling the ecological status of spawning grounds of commercially important fish under changing human pressures (M. Vetemaa)

WP5: MONITORING AND MANAGEMENT RECOMMENDATIONS (G. Martin)

- 5.1. Developing the proposal for amendment of Estonian national marine monitoring programme (K. Torn)
- 5.2. Developing methodology for defining the areas suitable for developing the Blue economy and approaches for establishing the needs for additional investigations for EIA. (G. Martin)

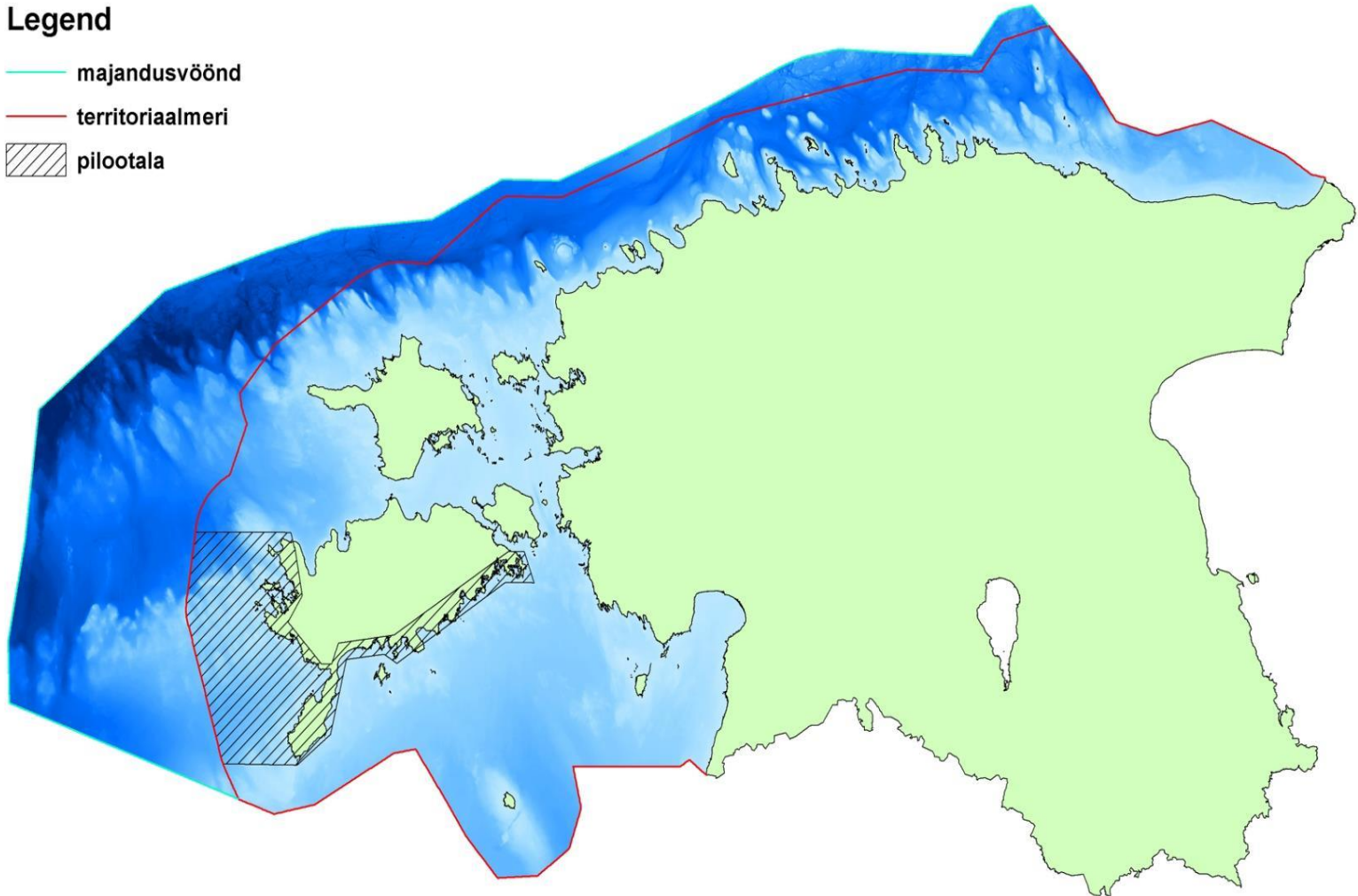
Location of the pilot area

Legend

— majandusvöönd

— territoriaalmeri

▨ pilootala



Project timetable

Workpackage	Activity	Partners	Stage I				Stage II				Stage III			
			2019 I kv	2019 II kv	2019 III kv	2019 IV kv	2020 I kv	2020 II kv	2020 III kv	2020 IV kv	2021 I kv	2021 II kv	2021 III kv	2021 IV kv
WP1	1.1.1 Overall project management	EMI MB	X	X	X	X	X	X	X	X	X	X	X	
	1.2.1 Steering committee	EMI MB			X		X		X		X		X	
	1.3.1 Periodical reporting	EMI MB, all partners	X	X	X	X	X	X	X	X	X	X	X	
	1.4.1 Dissemination of the results/seminars	EMI MB, all partners				X			X				X	
WP2	2.1.1 Characterization of water column habitats by employing autonomous high-frequency observations	MSI, EMI OP	X	X	X	X	X	X	X	D				
	2.1.2 Carbon system and acidification indicator	MSI		X	X	X	X	X	X	D				
	2.2.1 Baltic chlorophyll-a algorithm	EMI OP	X	X	X	D								
	2.2.2 Estimating primary production from remote sensing	EMI OP					X	X	X	D				
	2.3.1. Optical remote sensing for mapping seabed habitats	EMI MB, EMI OP	X	X	X	D								
	2.3.2. Seabed geological inventories: acoustic profiling and sediment survey	GI		X	X			X	X	X	X	D		
	2.4.1 Evaluation of the methodology of eDNA methodology for detection of cryptic alien aquatic organisms in the coastal zone of the Baltic Sea	EMÜ, EMI MB	X	X	X	X	X	X	X	D				
	2.5.1 Establishing a methodological framework to assess the functioning of fish spawning grounds	EMI KA	X	X	X	X	X	X	X	D				
2.6.1 Mapping the functioning of fish spawning areas with remote sensing	EMI KA, EMI OP, EMI MB		X	X	D									
2.7.1. Development of DNA-based approach for estimation of effective spawner abundance.	EMÜ, EMI KA	X	X	X	X	X	X	X	D					
WP3	3.1.1. Establishment of assessment criteria and threshold values of good environmental status for assessment of condition and extent of habitat types in the Estonian marine area	EMI MB	X	X	X	D								
	3.2.1. Testing the methodology and assessment of extent and condition of habitat types based on HELCOM HUB classification.	EMI MB						X	X	X	X	D		
	3.3.1 Mapping non-indigenous species using citizen science	EMI MB						X	X	X	X	D		
	3.4.1. Assessing the state of fish spawning grounds in the bays, streams and lakes adjacent to the coastal sea of Saaremaa.	EMI KA				X	X	X	X	D				
WP4	4.1.1 An empirical framework to assess cumulative impacts of different human pressures on key nature assets	EMI MB		X	X	D								
	4.2.1 An easy-to-use online tool that calculates cumulative impacts of multiple pressures on key nature assets in pilot areas	EMI MB					X	X	X	D				
	4.3.1. Modelling the ecological status of spawning grounds of commercially important fish under changing human pressures	EMI KA						X	X	X	X	D		
WP5	5.1.1. Compiling the time- and cost efficient marine environmental monitoring programme	EMI MB, EMI OP, GI, MSI								X	X	X	D	
	5.2.1. Compiling the criteria for selection of the areas suitable for developing Blue economy.	EMI MB, EMI KA						X	X	X	X	D		
	5.2.2. Establishing the methodology and defining the minimum data needs for EIA procedure for different Blue economy	EMI MB						X	X	X	X	D		

List of deliverables

20 deliverables:

Month 12 – 5

Month 24 – 8

Month 30 – 6

Month 36 – 1

Code	Deliverable	Month
2.1.1.	Methodology for spatial characterization of habitats using autonomous high-frequency in situ observations in combination with conventional monitoring, remote sensing and model outcomes.	24
2.1.2.	Carbon system monitoring guidelines and acidification indicator description.	24
2.2.1.	Improved chlorophyll-a algorithm.	12
2.2.2.	Remote sensing based primary production model	24
2.3.1.	Optical remote sensing for mapping seabed habitats: methodology and testing in pilot area	12
2.3.2.	Seabed geological inventories	30
2.4.1.	Development and evaluation of the performance of the proposed eDNA-based metabarcoding procedure for early detection of alien (cryptic) aquatic organisms in the Baltic Sea	24
2.5.1.	Methodological approach to analyse the contribution of different spawning grounds to the stock recruitment of different coastal fish	24
2.6.1.	A methodological approach for mapping important features of fish spawning sites with remote sensing.	12
2.7.1.	Development and evaluation of the performance of the proposed DNA-based procedure for estimation of effective number of pike breeders in the pilot spawning areas at coastal sea of Saaremaa.	24
3.1.1.	Methodological guidelines for assessing status of marine habitat types in Estonian marine area	12
3.2.1.	Description of the status of benthic habitats in the pilot area using developed methodology and criteria.	30
3.3.1.	A prototype of smartphone application for NIS mapping.	30
3.4.1.	Maps of the status of spawning grounds.	24
4.1.1.	Methodological frame to assess cumulative impacts of anthropogenic pressures on nature assets.	12
4.2.1.	Online tool for assessing cumulative impacts of multiple pressures on key nature assets	24
4.3.1.	Early-warning monitoring and analysis tool.	30
5.1.1.	Proposal for updating Estonian marine monitoring programme	36
5.2.1.	Set of criteria to define areas for developing the Blue economy	30
5.2.2.	Minimum knowledge set for performing EIA of different Blue economy projects.	30



Eesti mereala keskkonna ja loodusväärtuste hindamise ja seire innovaatilised lahendused



Projektist RITA Partnerid Tegevused Populariseerimine Tulemused Galerii Kontakt Juhtkomisjon

Projekti tellijad

Projekti tellija



Tellijad esindajad



Mere ökosüsteemi mõjutavad nii maismaal kui ka Läänemeres toimuvad enamasti inimtegevusest põhjustatud muutused. Paraku puudub suure osa Eesti mereala kohta kompleksne alusteave, et:

- hinnata mereökosüsteeme;
- arendada sinimajandust;
- kaitsta mereelupaikasad;
- kavandada ja rakendada asjakohasid meetmeid.

Euroopa Liidu merestrategie raamdirektiiv kohustab iga riiki välja töötama ja kasutusele võtma meetmeid, mille eesmärgiks on:

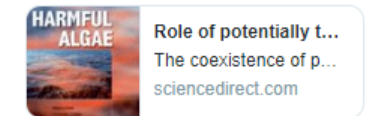
- kaitsta ja säilitada merekeskkonda, hoida ära selle seisundi halvenemine või taastada võimaluse korral mereökosüsteemid piirkondades, kus need on kahjustatud;
- hoida ära ja vähendada heiteid merekeskkonda, et järk-järgult kõrvaldada reostus ning tagada, et see ei mõjutaks ega ohustaks oluliselt mere

Tweets by @Mererita_EE

mereRITA_Estonia Retweeted

 **Kristel Panksep**
@KristelPanksep

Our paper about the role of potentially toxic #cyanobacteria in #zooplankton diet is out now! Take a look! @CYANOCOST @maaylikool #harmfulalgae free acces until december 😊
authors.elsevier.com/a/1ZvDS5aloFRR...



Role of potentially t...
The coexistence of p...
sciencedirect.com
Oct 17, 2019




mereRITA_Estonia
10 Tweets

You Retweeted

Kristel Panksep @KristelPanksep · Aug 12

Fieldworks for @Mererita_EE are successfully finished for this time. We tested various filters and collected #eDNA samples to detect invasive species in the coastal zone of the #balticsea. We also witnessed a bloom of #cyanobacteria in the shore
@NatureMetrics @ScatDNA @CYANOCOST



11

mereRITA_Estonia @Mererita_EE · Jul 10

Our colleagues, marine biologists from Estonian Marine Institute @unitartu are collecting samples of seabed habitats in western #Saaremaa Island, #Estonia

#marinelife #marinebiology #underwater



2

mereRITA_Estonia @Mererita_EE · Jul 30

Our partners from EMI @unitartu are sampling young-of-year fish using electrofishing and beach seine to construct a reference library of otolith chemical "fingerprints" in order to determine the natal origins of adults. #Saaremaa #marinebiology #fishing #otolith



1 6

mereRITA_Estonia @Mererita_EE · Jun 5

Our partner @KristelPanksep from @Maaylikool is testing the filtration system and collecting #eDNA samples from the #BalticSea @NatureMetrics #sciencetwitter



1 8



MereRita Projekt

Ajajoon ▾

2019 ▾

september ▾

Halda postitusi

Loendvaade

Ruudustikvaade

TOOKONT

Kool

Kodulinn

Perekonnaseis



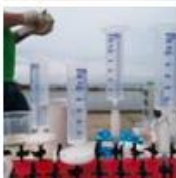
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Fotod

Lisa foto



MereRita Projekt

26. September · 🌐 ▾

Optilise ja akustilise kaugseire ning kohtvaatluste meetodikate arendamine merepõhja elupaikade kaardistamiseks





Euroopa Liit
Euroopa
Regionaalarengu Fond



Eesti
tuleviku heaks

Uuringu tellis ja uuringut rahastab Eesti Teadusagentuur Euroopa Regionaalarengu Fondist toetatava programmi „Valdkondliku teadus- ja arendustegevuse tugevdamine“ (RITA) tegevuse 1 „Strateegilise TA tegevuse toetamine“ kaudu. Uuring valmib Keskkonnaministeeriumi eesmärkide elluviimiseks.



Tänu tähelepanu eest!