Creation distribution maps of main abundant and rare species of macrophytic algae in coastal waters of the south-east Russian Baltic

Anna Sharton
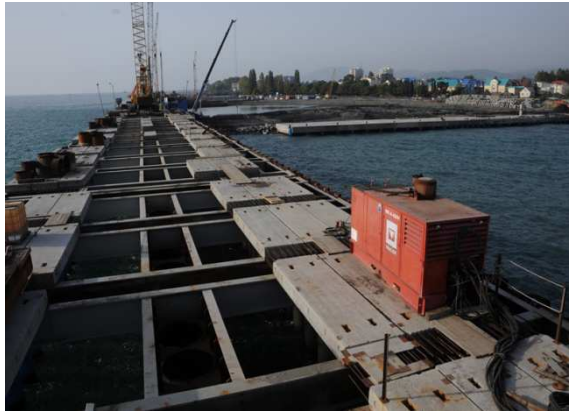Forest Information Technology 2011 (April, 2013)
HNE Eberswalde, Germany
P.P. Shirshov Institute of Oceanology, Kaliningrad, Russia

Why this topic

Baltic Sea activities in the Kaliningrad region

building of ports and development of sea transport

fish farms and fishing
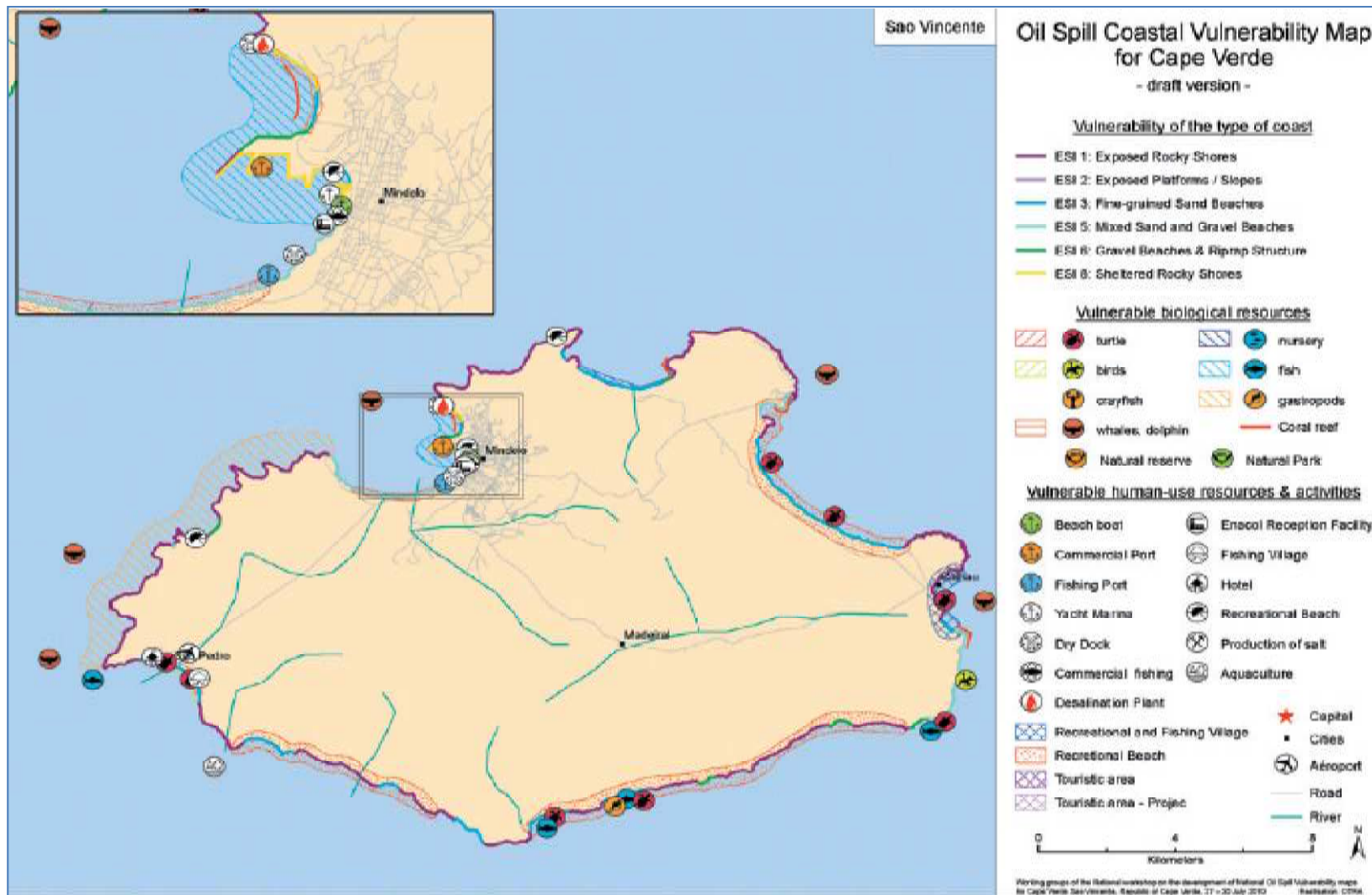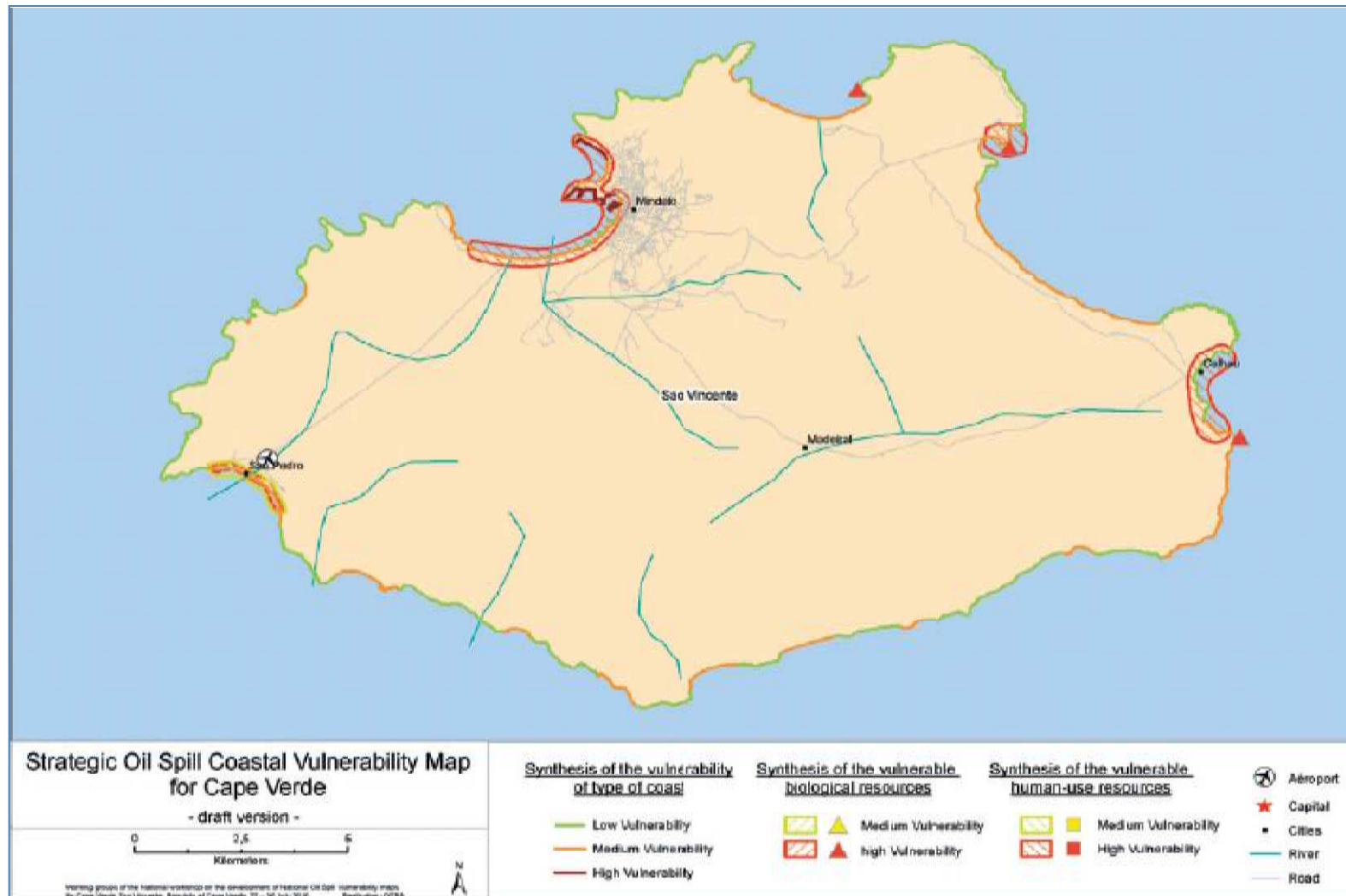

petroleum and minerals mining

coast protection; recreational activity and others…

Why this topic

The environmental, socio-economic, logistical and operational information on a tactical oil spill sensitivity map provides the basis for locating sensitive sites and resources along the coastline of Cape Verde (the map from IPIECA/IMO/OGP 2011)
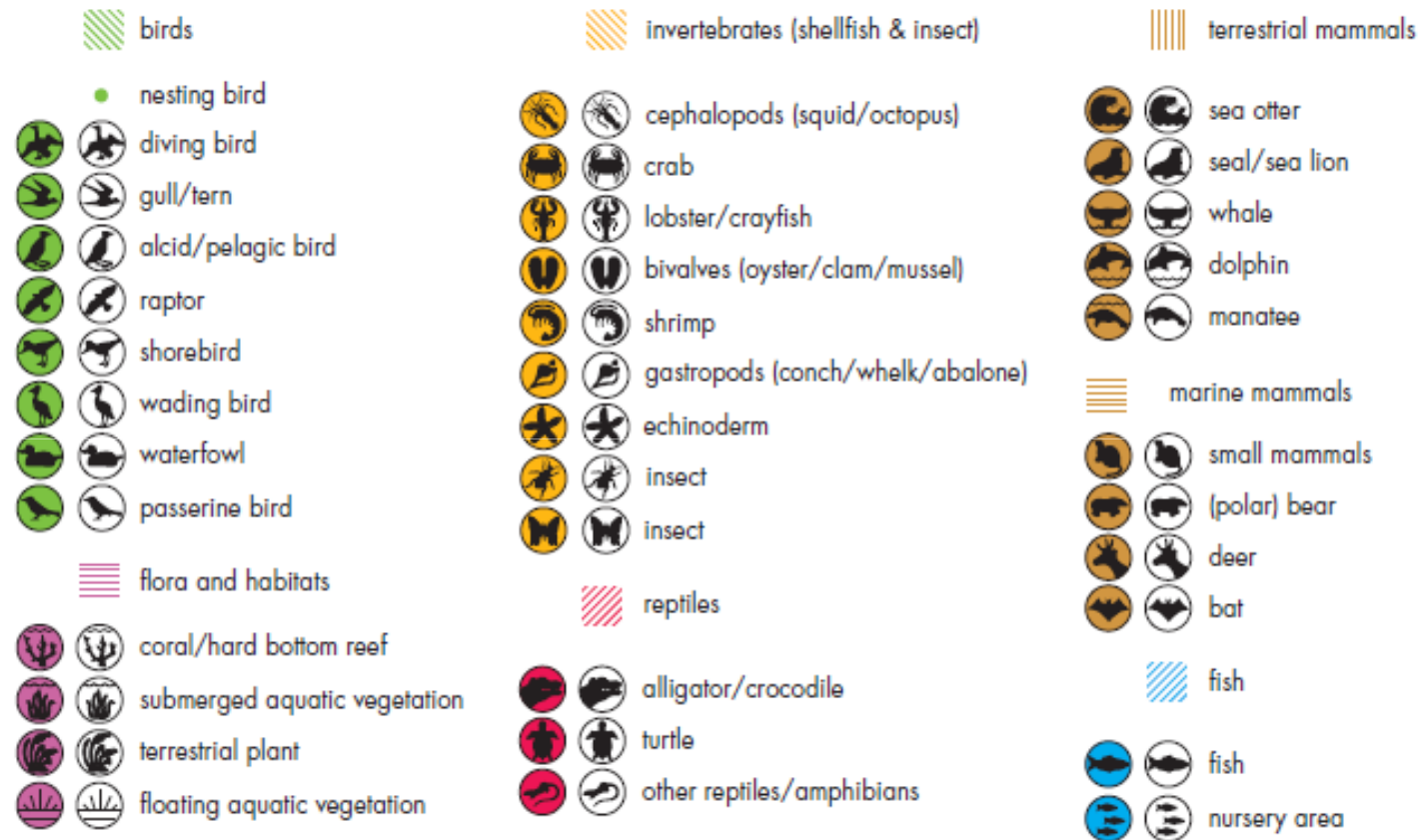
Why this topic

Strategic oil spill sensitivity maps provide a broad perspective to help locate and prioritize the most sensitive coastal sites of Cape Verde (the map from IPIECA/IMO/OGP 2011)

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Why this topic

Symbols of IMO/IPIECA for the mapping of sensitive biological resources

IMO (The International Maritime Organization)
IPIEKA (International Petroleum Industry Environmental Conservation Association)

Objective

The *objective* of this project was mapping of main abundant and rare species of macrophytic algae in some regions of coastal waters of the south-east Russian Baltic

The *tasks* included creation the following categories of maps:

- Separate algae species distribution

- Areas of annual and perennial species distribution

- Distribution of different divisions (Rhodophyta, Chlorophyta, Phaeopthyta)

- Areas of the rarest macro algae distribution

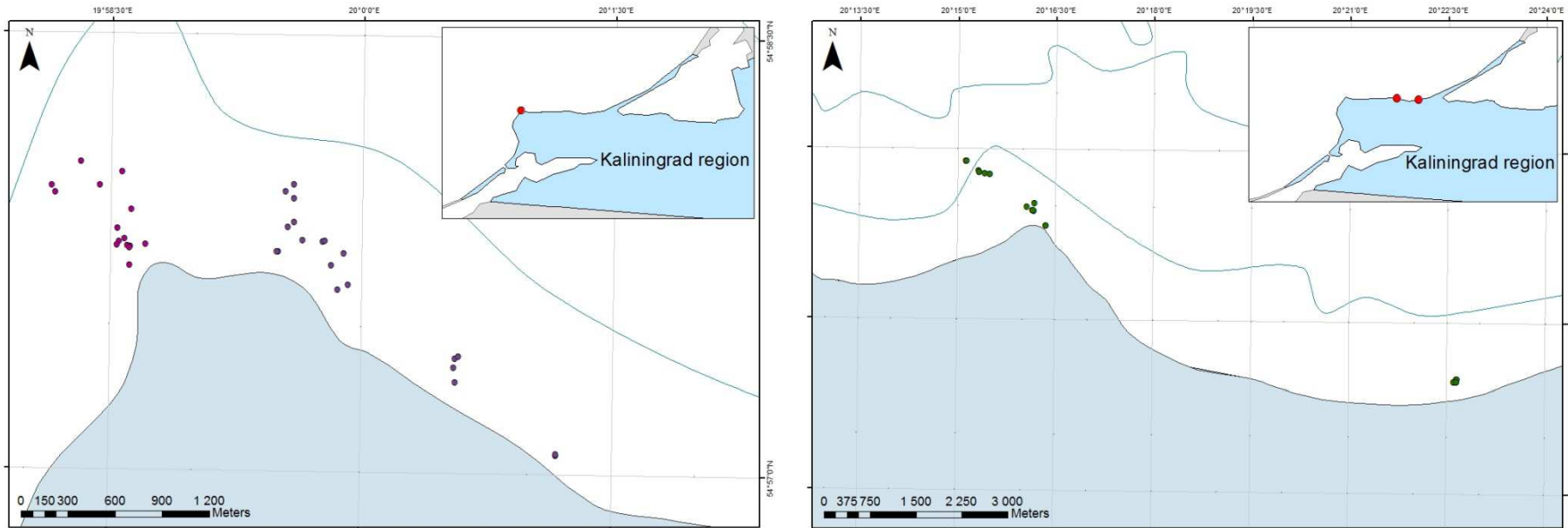- Maps of biomass distribution of separate species

Methods. Study area

Investigated coastal area of south-eastern Russian Baltic Sea
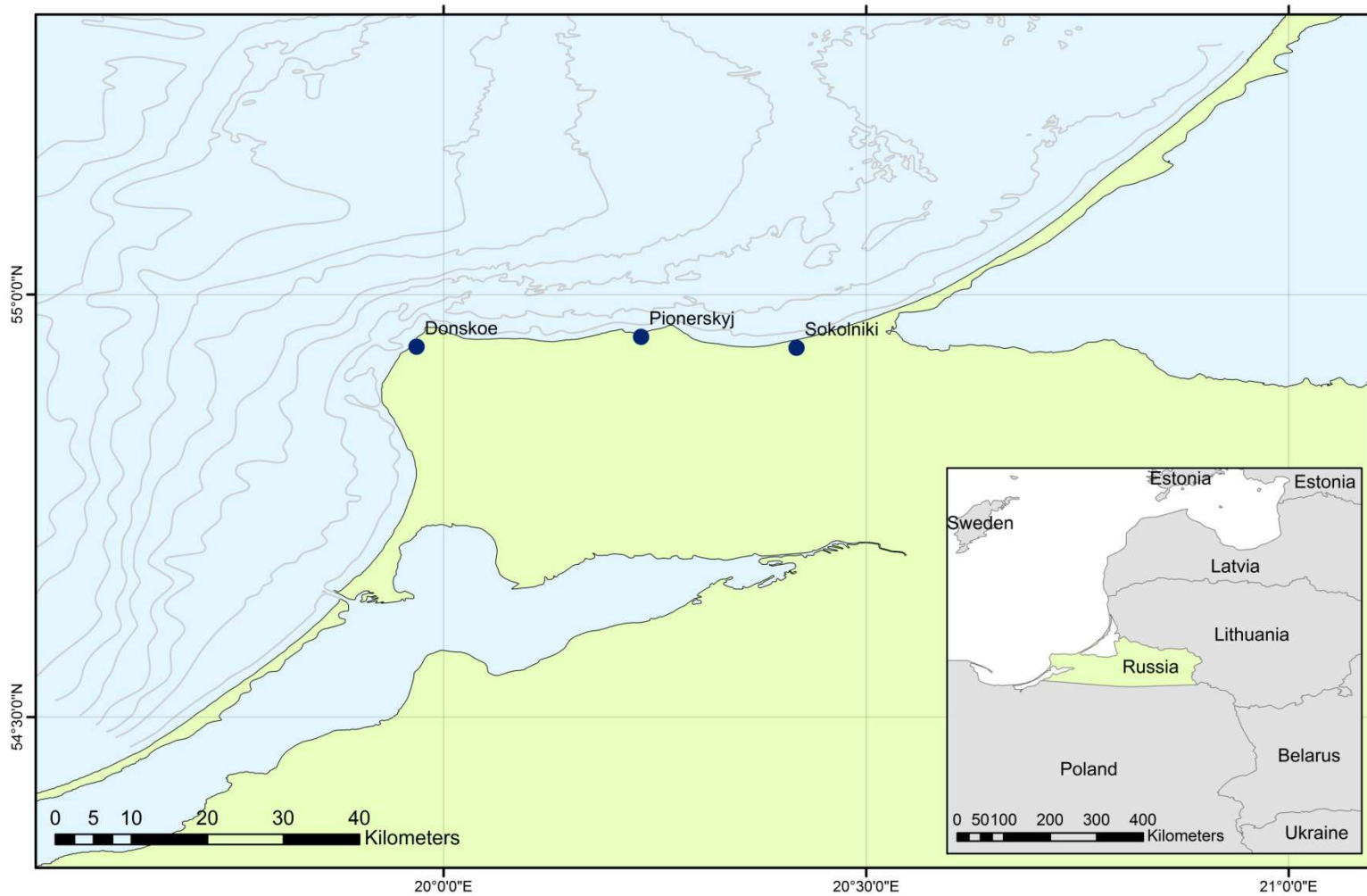
Methods. Data sampling

Sampling stations location

- 77 stations in coastal waters of the South-Eastern part of the Kaliningrad region were investigated during 2008-2012 by the Marine Ecology Laboratory (P.P. Shirshov Institute of Oceanology)

- Samples were taken by scuba diving

- Positioning at stations was executed by the Garmin-72 instrument of satellite navigation

- Place features (depth, substratum, and nature of growth) were noted on each station

Methods. Approach

Software: ArcMap/ArcGIS 10.0

Data: • shape files with vector data (provided by IT Department, Institute of Oceanology): Russian coast of the Baltic Sea, state boundary and isobaths of the sea

• excel data sets with station coordinates, algae species, sediment type and depth (provided by Marine Ecology Department, Institute of Oceanology)

Software tools:

- Cartography Tools (Generalization)

- Geoprocessing

- Spatial Analyst Tools (Interpolation)

- Georeferencing

Results

| Division/species	Life time	Distribution in RS SEB	Sediment type	Maximum Depth, m
RHODOPHYTA				
Furcellaria lumbricalis	p	R	b, r	9.0
Polysiphonia fucoides	p	W	b, r	12.0
Ceramium tenuicorne	p	W	b, r	9.0
Coccotylus truncatus	p	R	b, r, s	11.3
Hildenbrandia rubra	p	R	b, r	9.75
Polysiphonia nigrescens	a	R	NA	NA
PHAEOPHYTA				
Sphacelaria arctica	p	R	b, r	9.0
Pylaiella littoralis	a	W	b, r	8.0
Ectocarpus confervoides	a	LR	b, r, s	9.0
CHLOROPHYTA				
Cladophora rupestris	p	W	b, r	9.0
Cladophora glomerata	a	W	b, r	11.3
Ulva intestinalis	a	W	NA	5.2
Ulva prolifera	a	W	r	3.2

List of macroalgae species of the South-Eastern Baltic Sea, Russian part

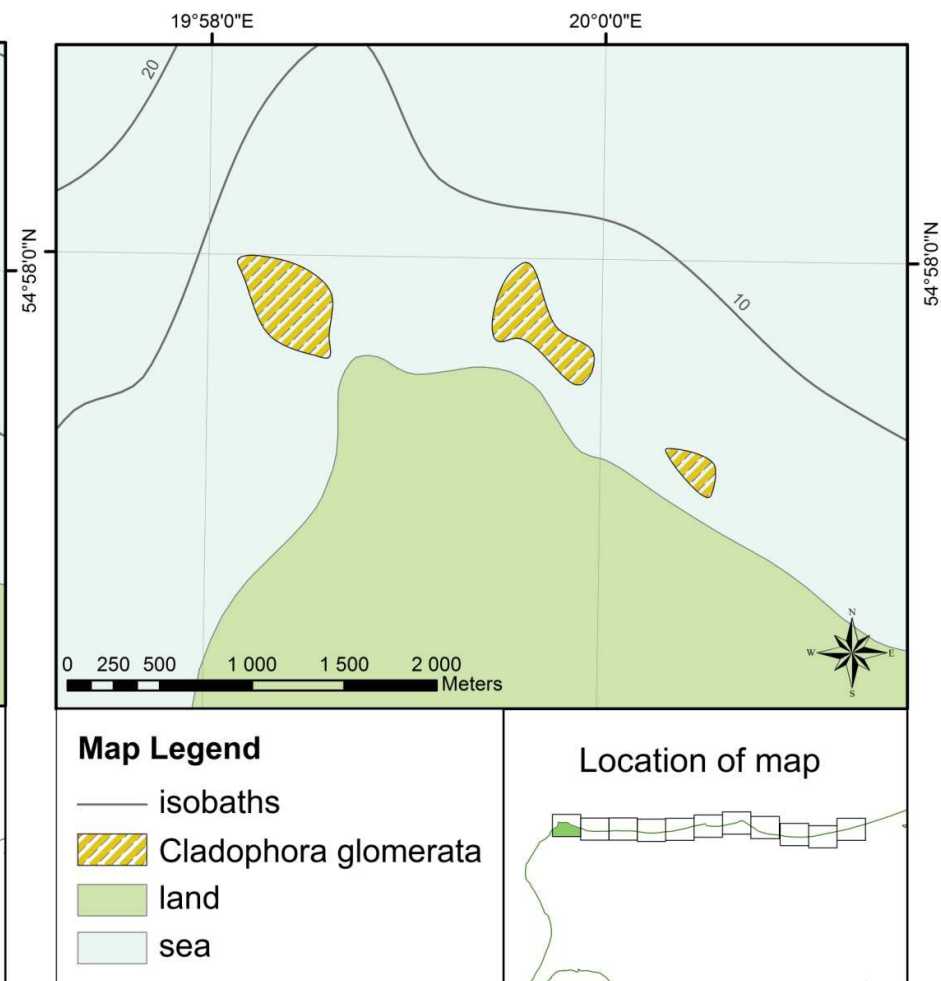* RS SEB: Russian Sector of South-East Baltic
**a – annual, p – perennial; b – boulders, r – rocks, s – sand; R – rare; W – widespread,
LR – locally rare;
NA – missing data

Results

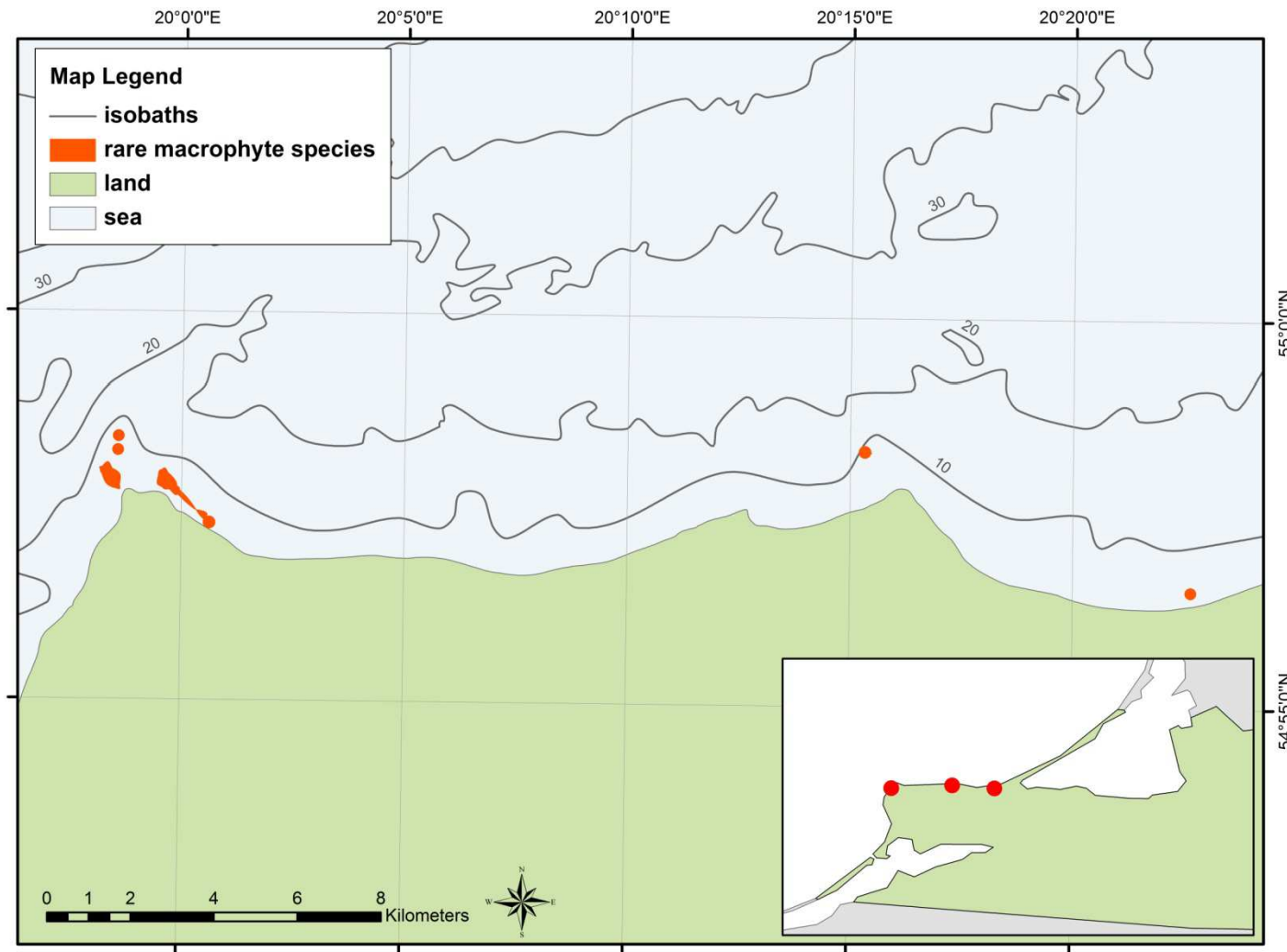Distribution of *Furcellaria lumbricallis* around Taran Cape
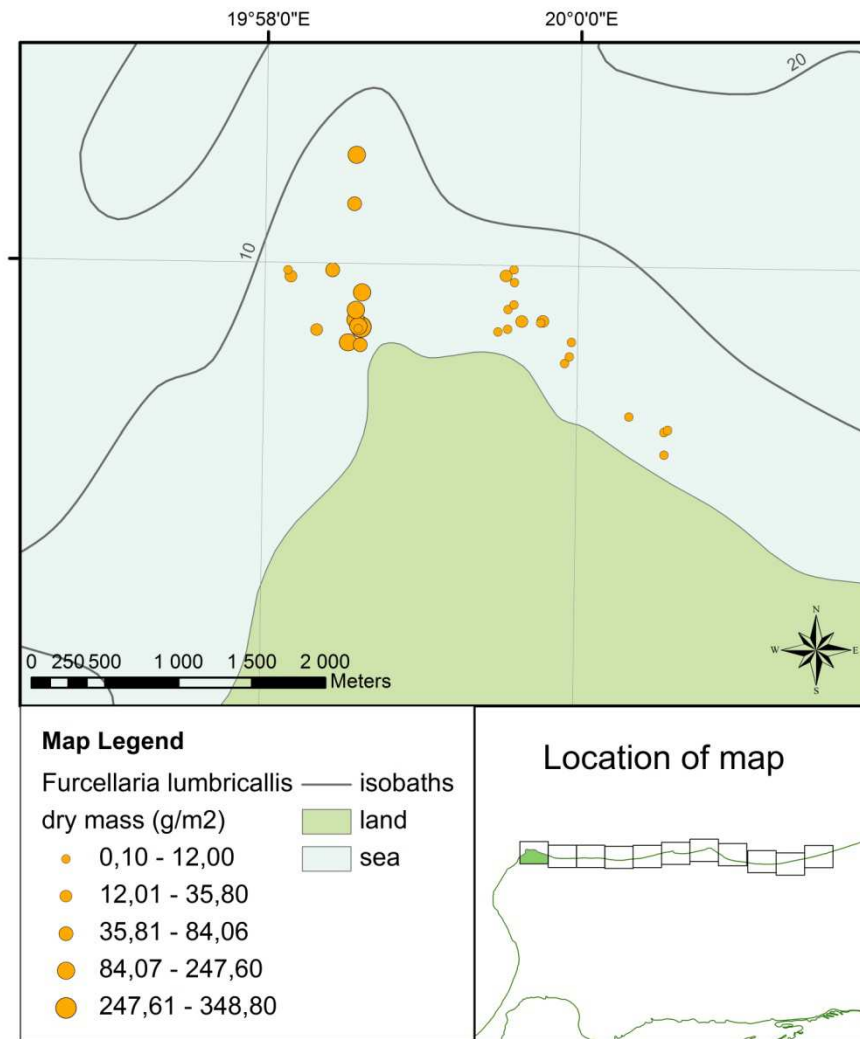
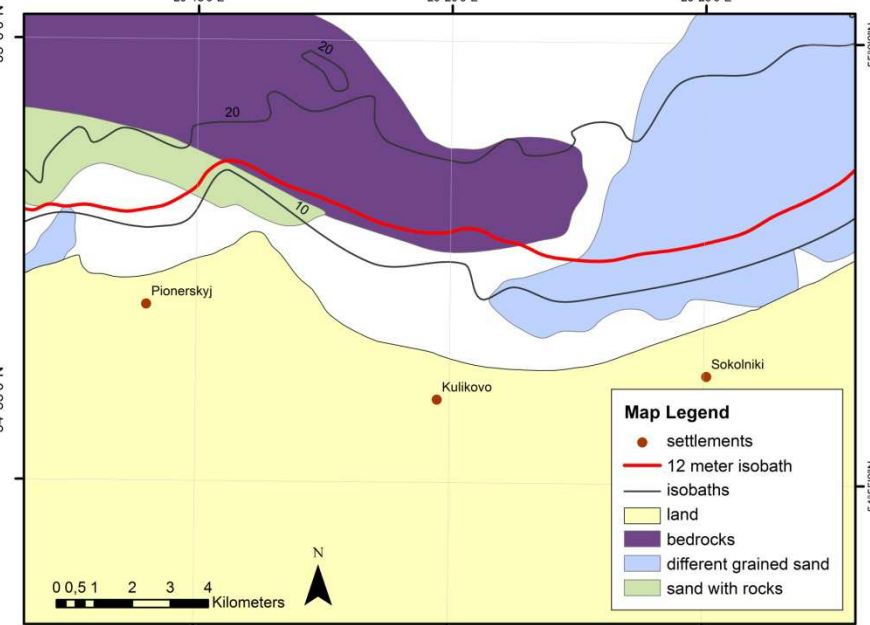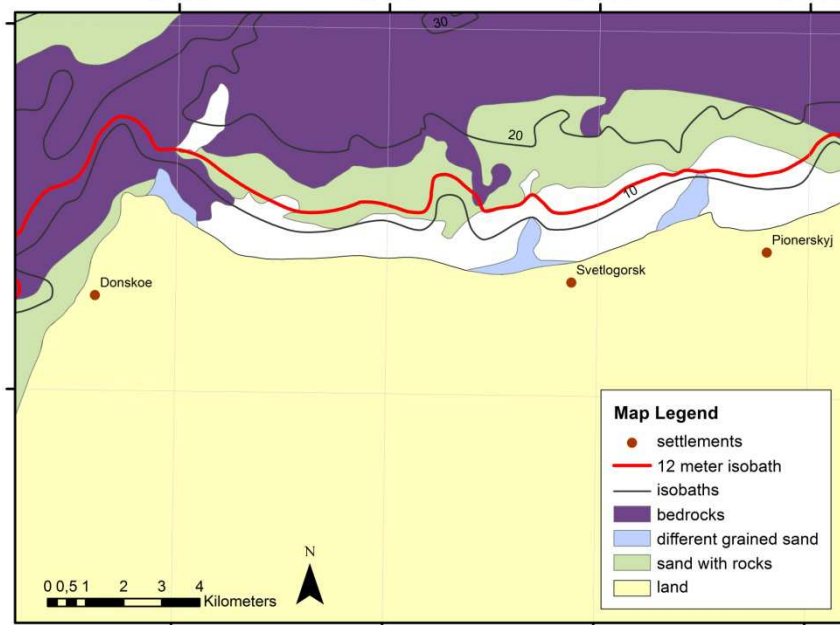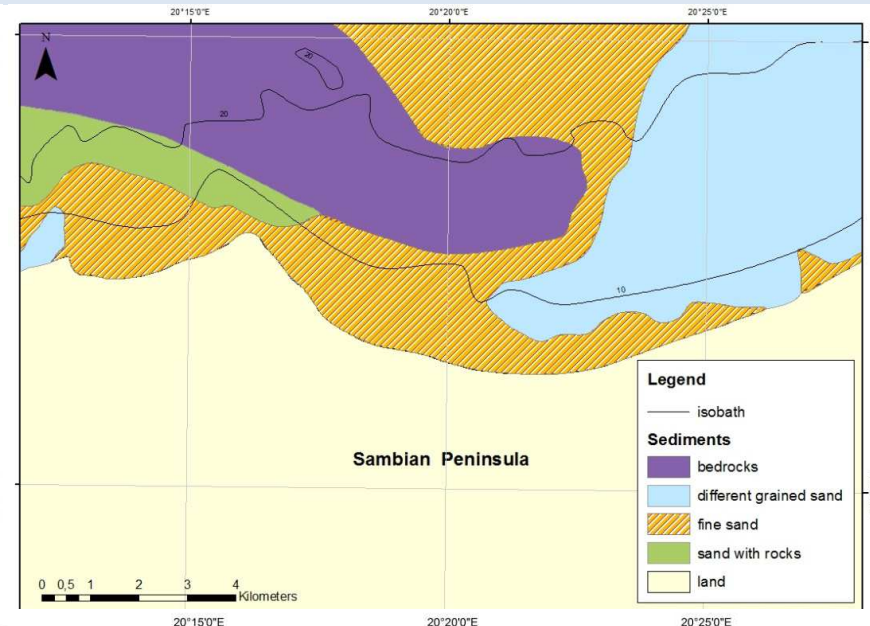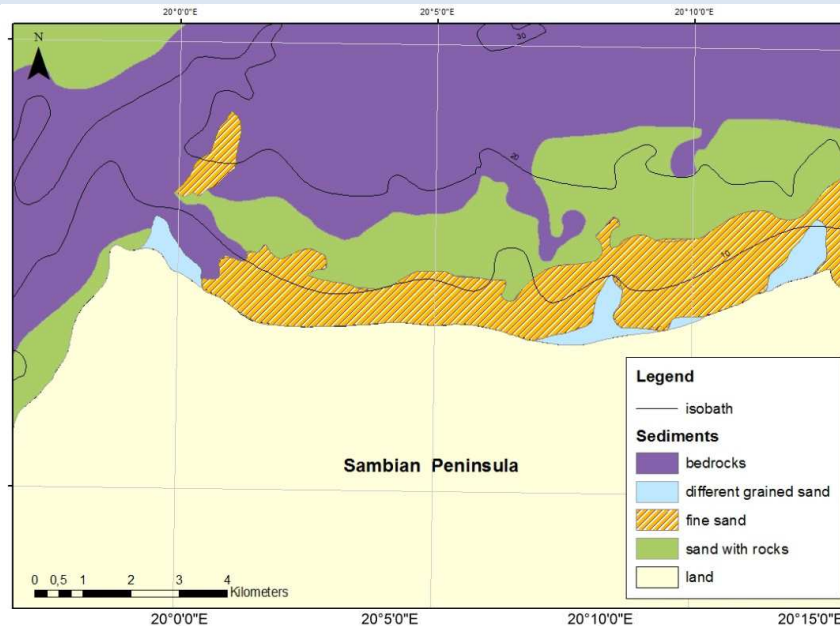Distribution of *Cladophora glomerata* around Taran Cape

Results

Rare macroalgae species distribution along north-east Russian
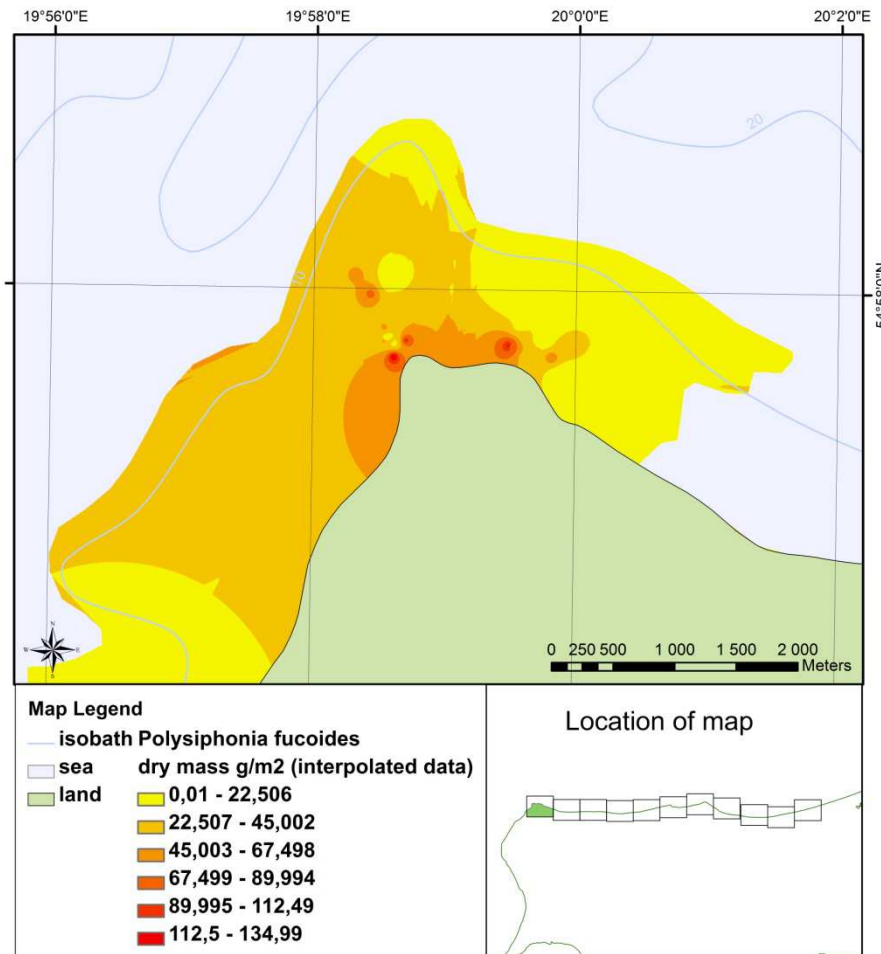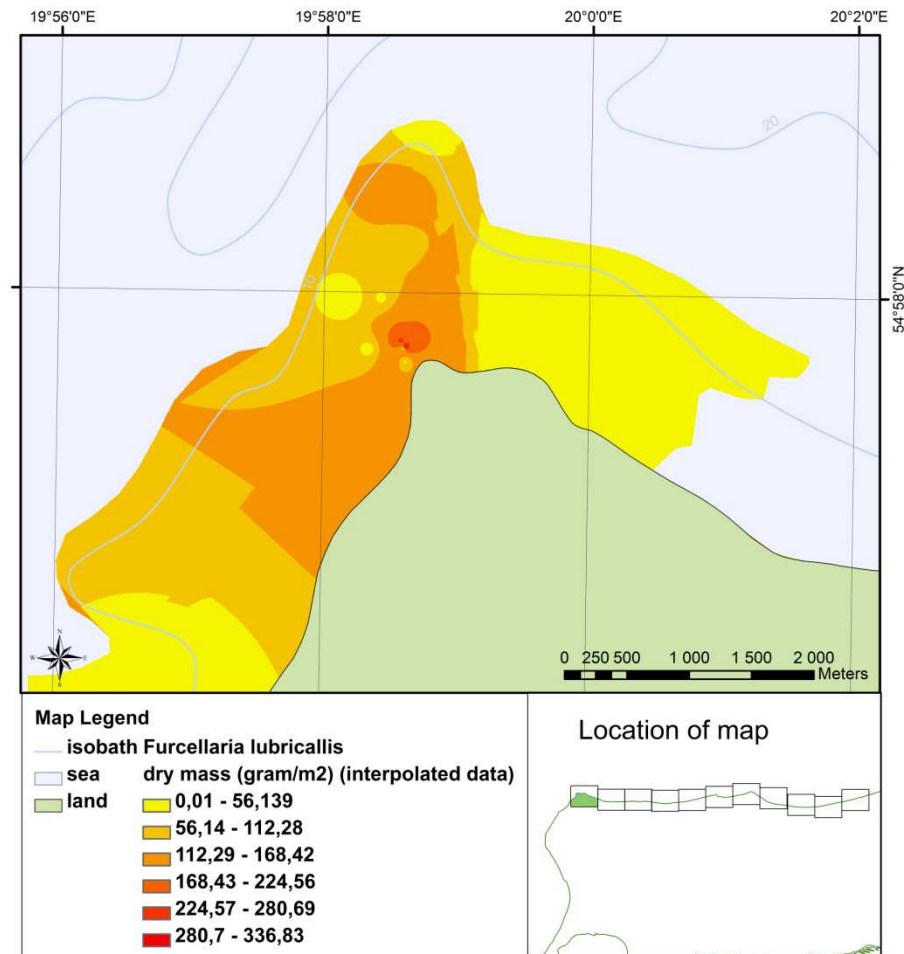Baltic

Results

Results

Interpolation of biomass distribution of *Polysiphonia fucoides* around Taran Cape
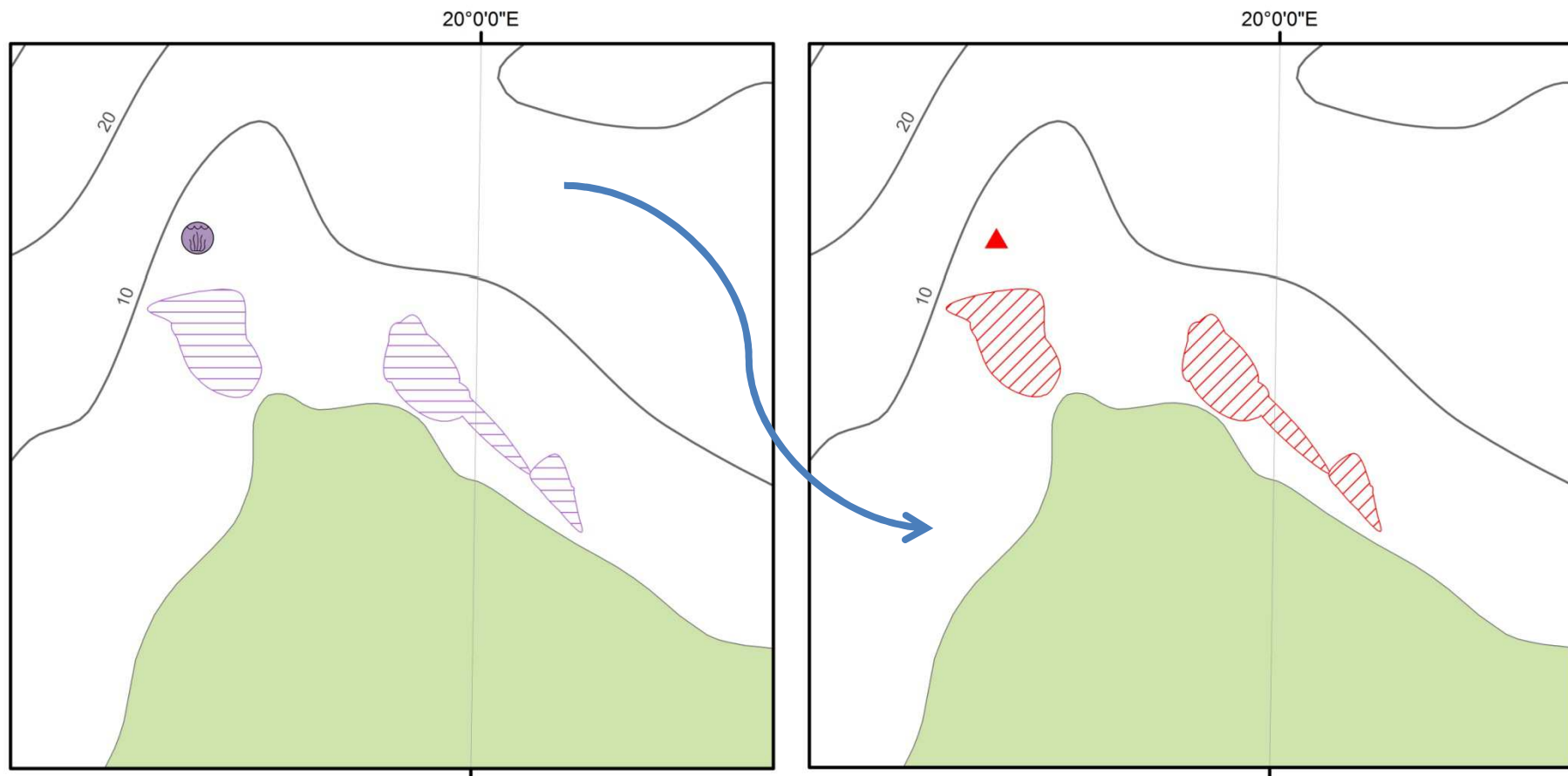
Interpolation of biomass distribution of *Furcellaria lumbricallis* around Taran Cape

Conclusions

- In the Russian part of the Baltic Sea the macroalgae distribution is very restricted that makes their habitat areas valuable

Conclusions

- Areas with the highest biomass and dense coverage are localized near the Taran Cape that is caused by types of the sediment, including stones and boulders up to the depth of 12 meters

- The Taran Cape is a unique habitat for Russian EEZ because on sharp slope, wave exposure and low water transparency, redoubled by coastal sewages

- The macro algae distribution maps in corporation with other future performed sets of data will form a core of the future Russian Baltic coastal area strategy plan.

The End

Thank you for attention!

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