

ENVIRONMENTAL SOLUTIONS AND MODERN TECHNOLOGIES

OIL SPILL webinar 18 November 2021

DELTA

GREEN

LINE EU

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LTD «Delta Green Line» is fast growing company from Latvia established in 2014, providing reliable environmental and port expertise services to commercial and governmental sectors in Baltic States as well as on the global scale. The company is driven by the team of professionals and comprises expertise of maritime, environmental and security domain.

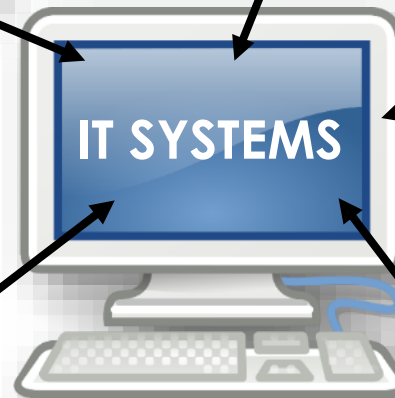
***Our mission** is to provide our customers with innovative and reliable solutions. We always step into our client's shoes to take their satisfaction to the next level. We not care only about our clients requirements but also conduct all their transactions as if they were our own. This means our clients profits are the ultimate reflection of our success.*

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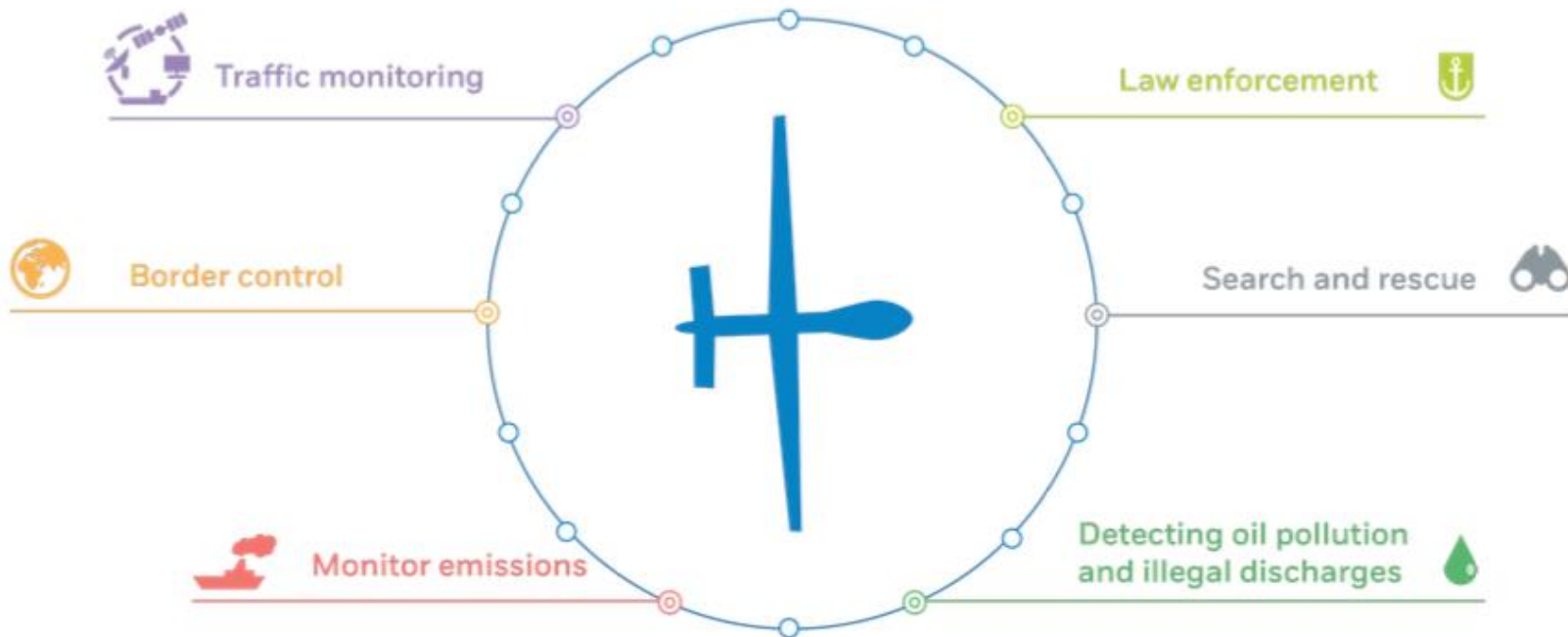
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Monitoring



Improving monitoring quality



Spectrum analysis/Oil water contamination test

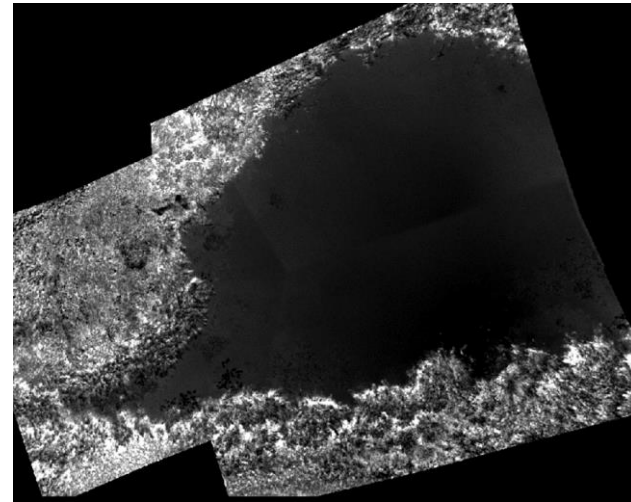
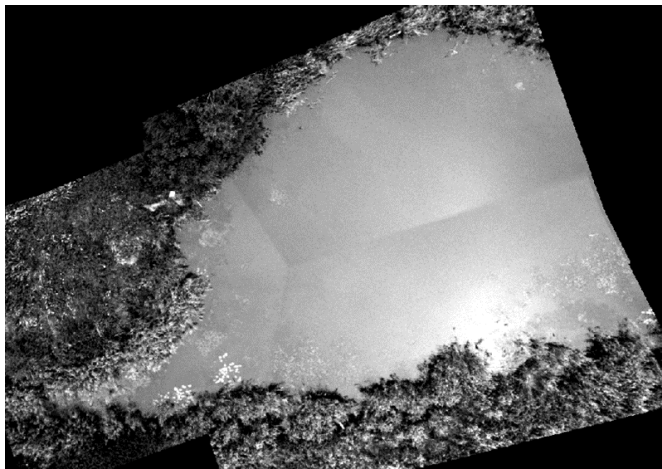
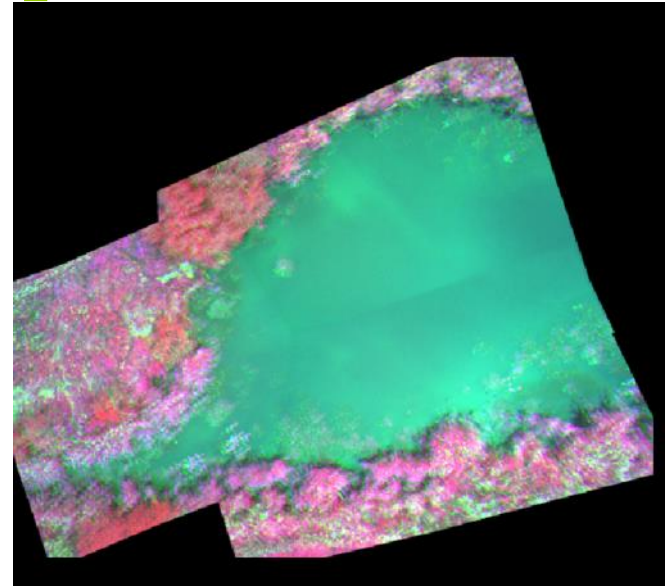
Equipment:

- RGB cameras Z3;
- Spectrum camera.

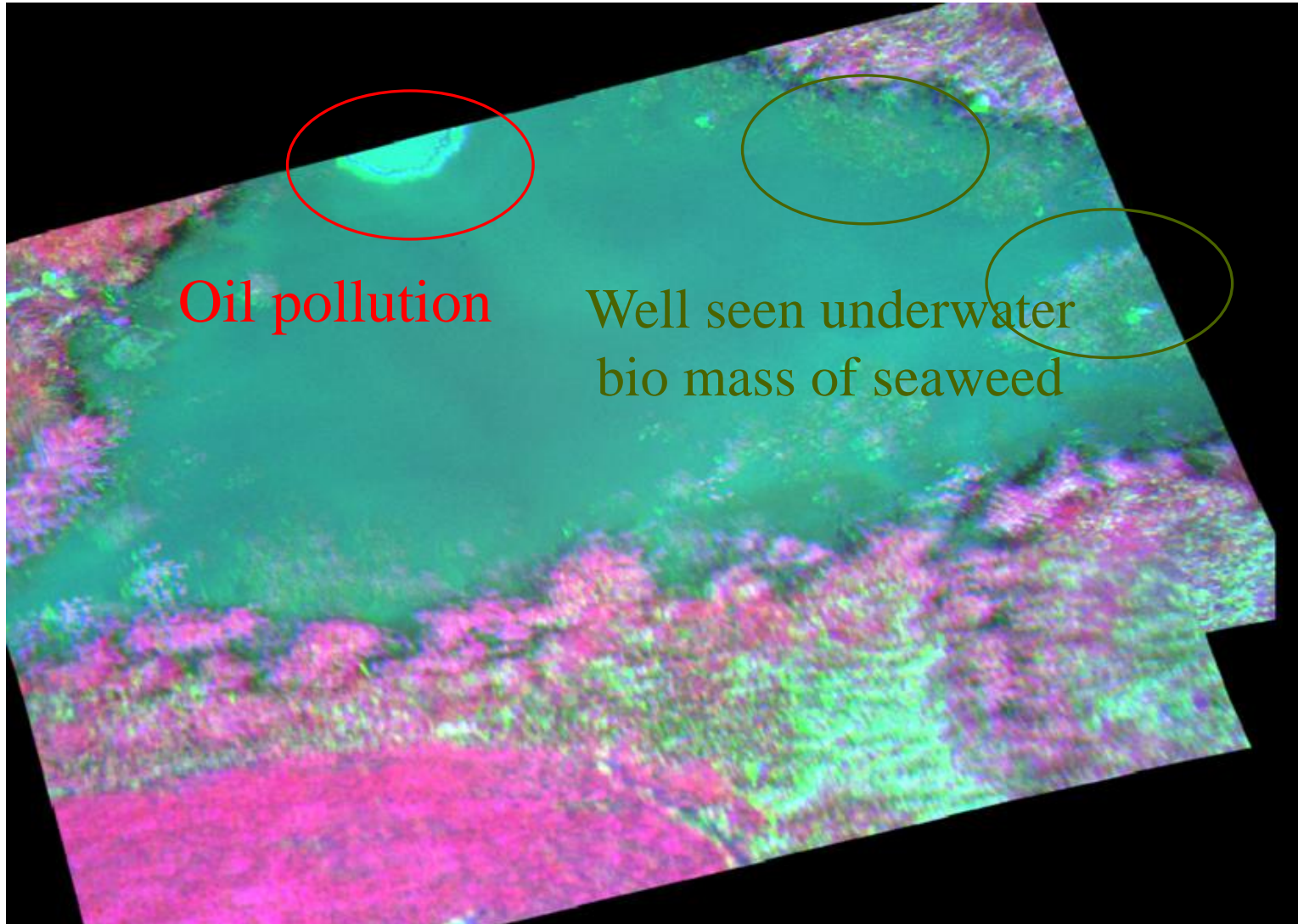


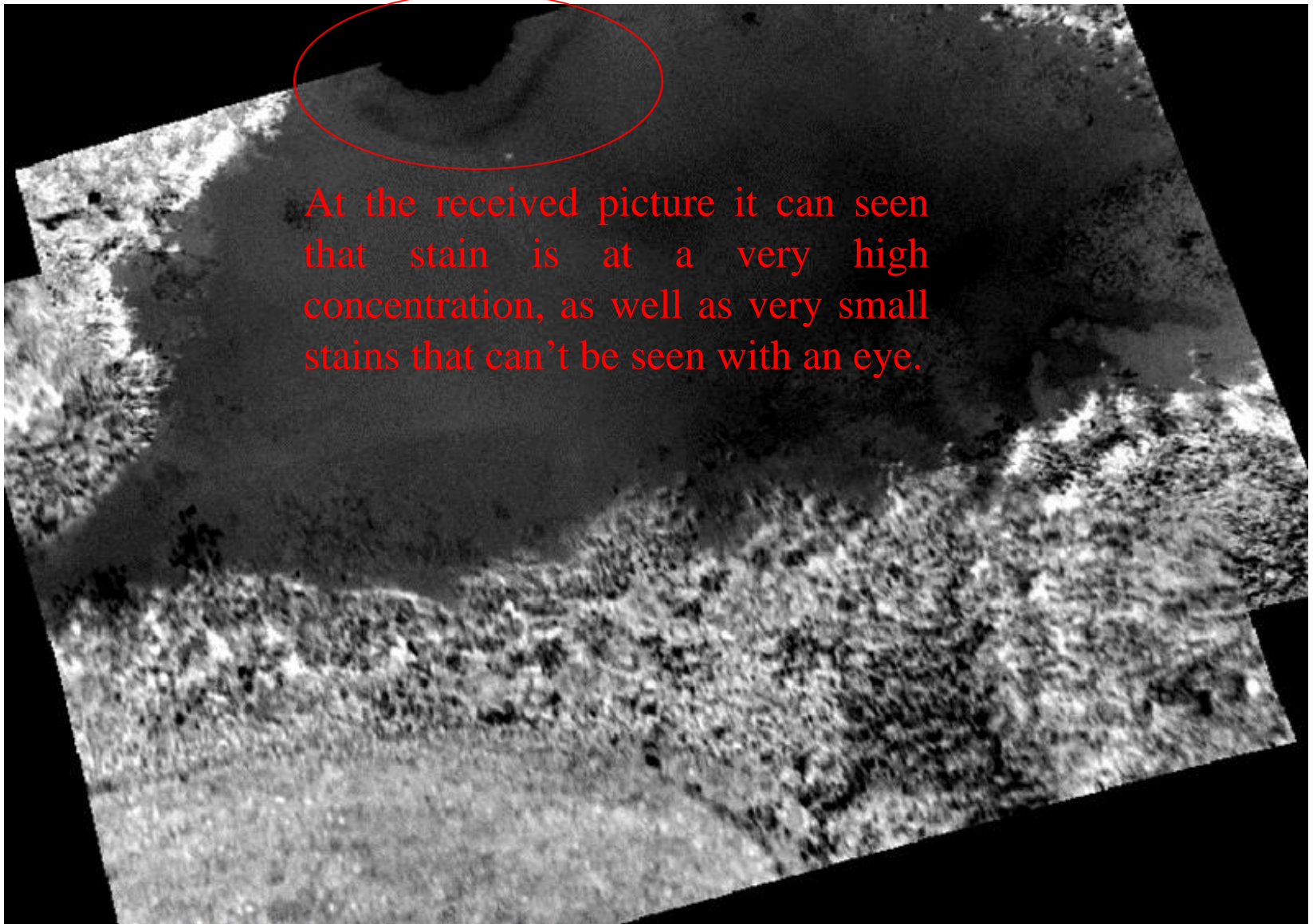
Overall capacity of port area

Situation before contamination



Contamination of water (oil 0,1 lit.)





At the received picture it can be seen that the stain is at a very high concentration, as well as very small stains that can't be seen with an eye.

Results and possibilities of technologies

Tracing of limits of water contamination (automatic calculation) with oil, as well as, dynamic of spreading and condition.

Main areas of use:

- In the ports and ports areas;
- In the places of urban, factory and country side sewage;
- In the rivers;
- In the coast area and area that are used for research for changes in contamination limits.

NEW SOLUTION UNDERWATER DRONE



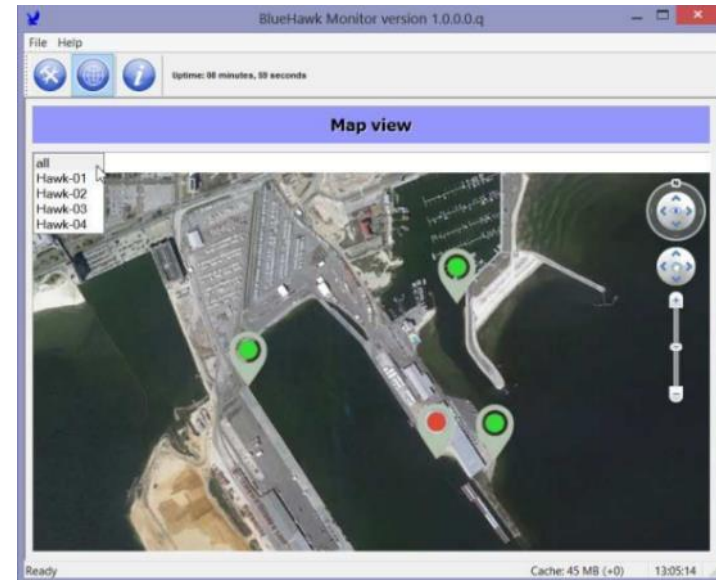
Underwater drone with our
own programme artificial
intelligence solution

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BlueHawk Oil detection sensor



BLUEHAWK

OIL DETECTION SENSOR

Notice / information

The situation is never so bad that it cannot be made worse any bad communication!



Reaction



Localization



Recovery



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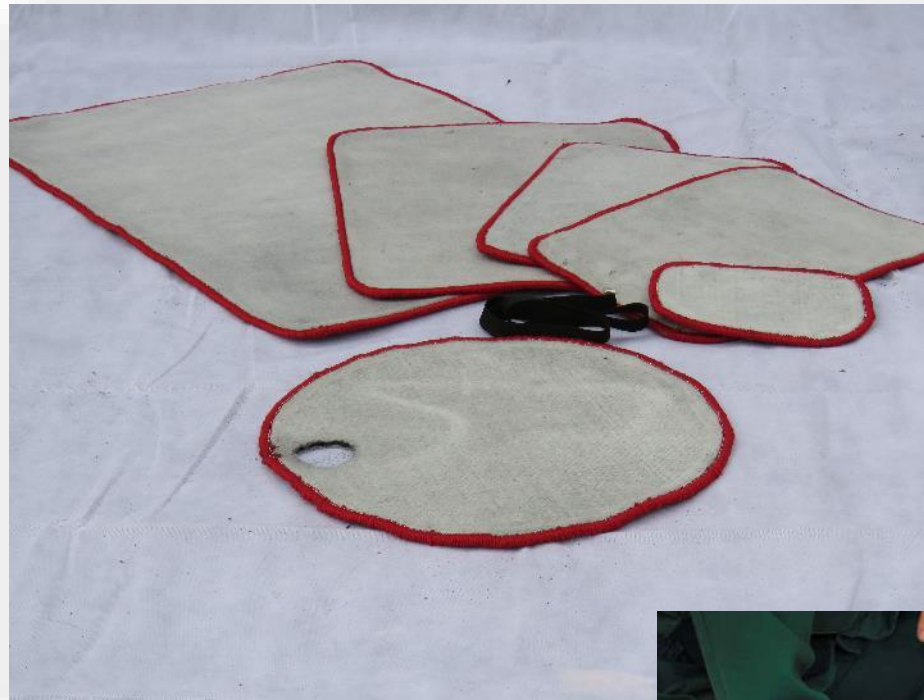
Various Solutions



OIL SPILL RESPONSE
ABSORBENTS

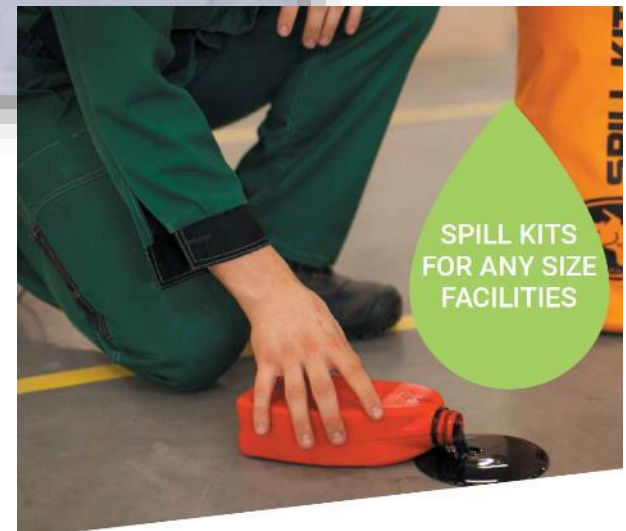
SUPER
ABSORPTIVE
UNIVERSAL
GRANULES

Workshop mats



SORB & GO PILLOW

- Keeps your hands clean
- Absorbs any kind of liquids
- Keep it handy in your car in case of small spills



SPILL KITS
FOR ANY SIZE
FACILITIES

Draggable Mats

- Advantages
- Absorbs in micro seconds
- Works in current water
- Also for hydraulic oil



Aprox. 10 L Oil per sqm – real values!

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Barrier belts



Why does it work?

An *Innovative method* in the collection of oil pollution

The granulate (which is also inside the mats and belts) attracts oil products like magnet.

**Clay Ceramic
Hollow Spheres
- absorbent!**

This solution will ensure environmentally friendly ports, immediately reaction for pollution response.





Baltics port (LT, LV, EE) incident analysis

- More popular cause of the oil spill – 30% accident and 60 % cases the damage and the source of the oil spill is unknown in 10% of cases;
- Type of spilled oil products - diesel fuel, hydraulic oil, bilge waters and oil products is unknown;
- The amount of oil spills. In only 40% cases it was possible to determine the amount of oil spills with sufficient accuracy;
- Most incidents involve only PORT MANAGEMENT staff and in the other cases supported by Coast Guards and Environment protection agency.

Advantages over existing services / products on the market

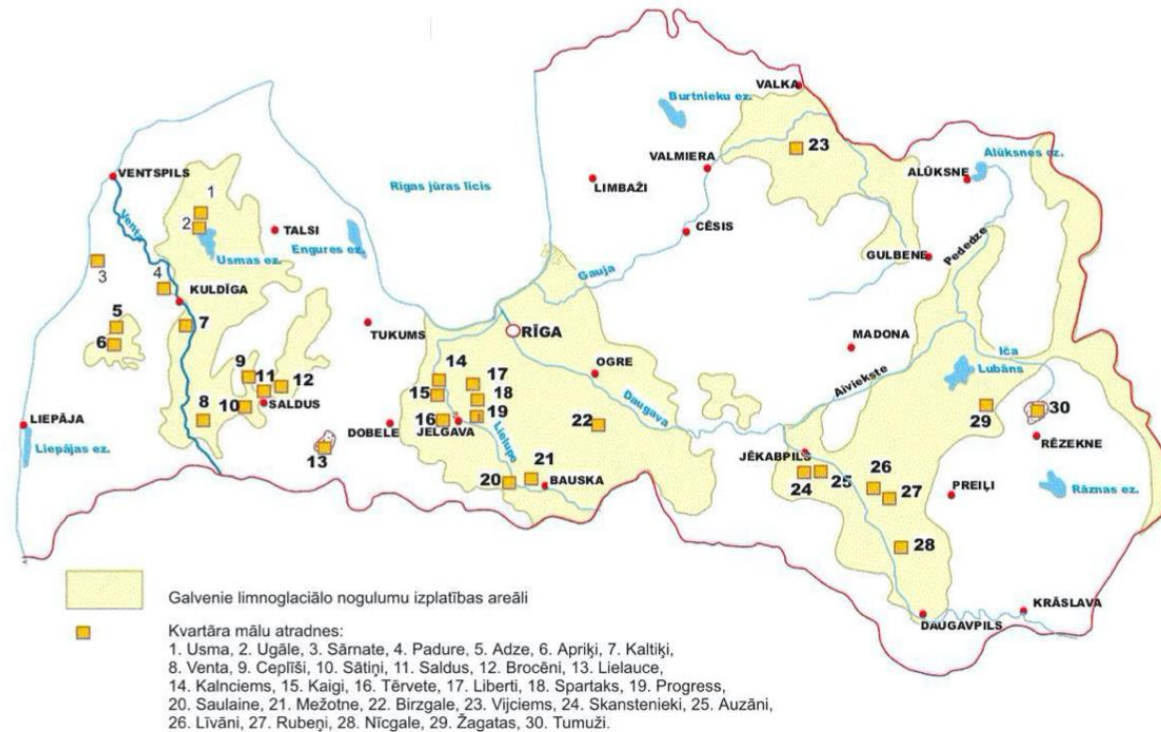
- ▶ Currently, the equipment in the ports and the decontamination technology **do not intend to simultaneously limit and absorb spilled oil products**
- ▶ Existing **technologies include the** use of heavy equipment, tugs, skimmers, pumps, etc., which are suitable for the collection of heavy oil products (heavy fuel oil, crude oil, etc.), but much less efficient for the collection and containment of light oil products (diesel, oil, petrochemicals, etc.)
- ▶ On this case approximately **40 – 60 % of heavy fractions of oil are on the bottom**
- ▶ **Expensive waste recycling**



Interesting party on NEW Oil pollution response technology



New product INNOVATION



J. Straume

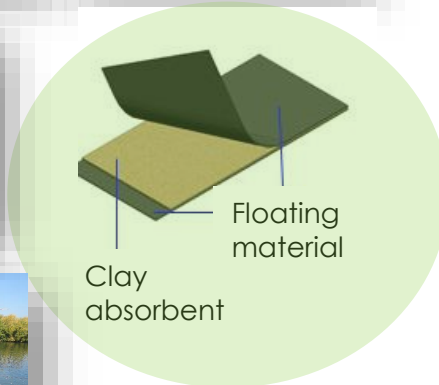
Clay depositions in Latvia

Our inventions and laboratory research

Sample	Sorption capacity						
	Gasoline, (g·g ⁻¹)		Diesel fuel, (g·g ⁻¹)		Engine oil, (g·g ⁻¹)		
	950 °C	1050 °C	950 °C	1050 °C	950 °C	1050 °C	
KDG	0.20	0.21	0.22	0.23	0.32	0.2	
PKG-M	0.38	0.35	0.45	0.43	0.55	0.46	
PKG-K	0.83	0.74	0.95	0.93	1.05	0.95	

Clay Ceramic Hollow Spheres – absorbents

SUPERIORITY



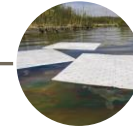
- Up to **75% absorbs better** than other absorbents available on the market
- Does not absorb water but only oil products
- Eco – friendly product
- Collection of **oil from the water surface**
- 80% of save costs and time** compared to traditional market solution, our solution quick response with 2 people and a boat to prevent heavy oil fractions from drowning in groundwater
- Development a specialized absorbent belt (hybrid solution) that will be able to ensure absorption at the same time with restriction oil boom**, that will prevent the spread of oil products

Completed cycle of oil pollution collection and utilisation

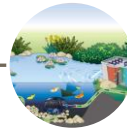


Wide range of application
ceramic and metalloceramic HS
are proposed:

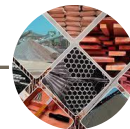
Ceramic and
metalloceramic
HS are proposed



Oil absorbent



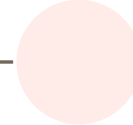
Water retention



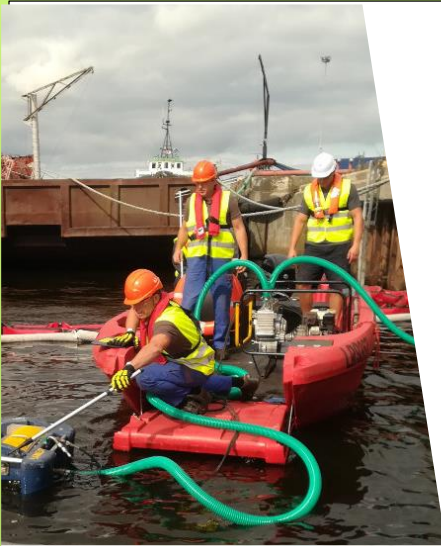
New construction
material



Multi-Purpose
sorbent

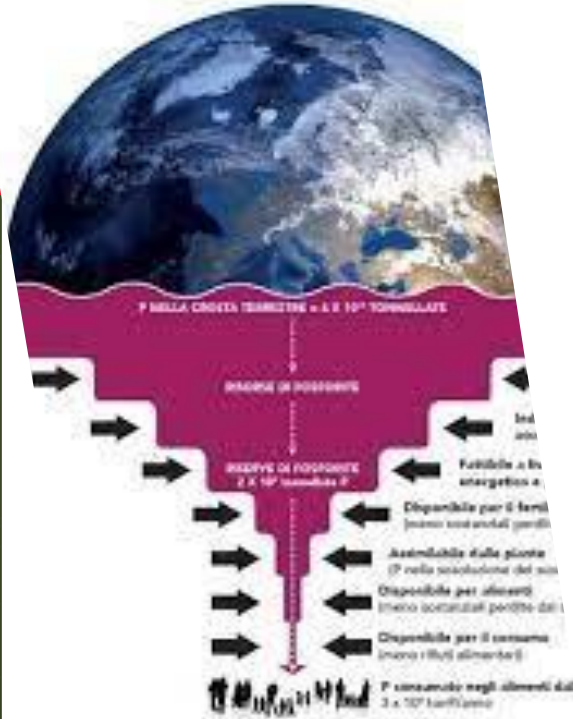


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We found as well additional possibility to use:

- Collection of phosphorus in granules as it contains aluminum, iron, calcium
- Further phosphorus possible separation and its subsequent sale. Clay granules reuse



Spill prevention systems

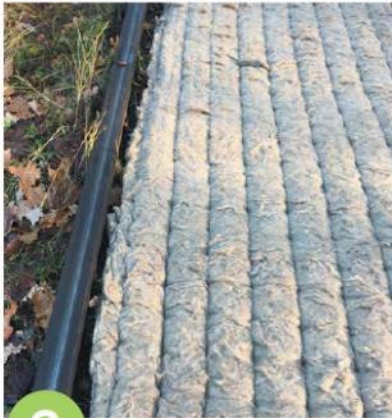


GO Shield keeps the ground clean



1

Just roll out GO Shield.
No equipment needed



2

GO Shield is placed in the
sensitive to oil spills areas



3

Place chip on top to secure
the Shield



**THE SYSTEM EFFECTIVELY TRAPS OIL
FROM CATASTROPHIC
SPILLS AND LEAKS**

- Absorbs oil and protects ground
- Easy to install and remove
- 100% eco-friendly
- Repels water
- UV-protected

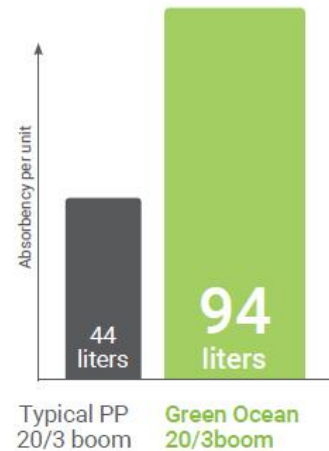
absorbs
up to
300
liters
of oil

Absorbent Booms

- Booms have links at both ends that can be hook together for any size spill



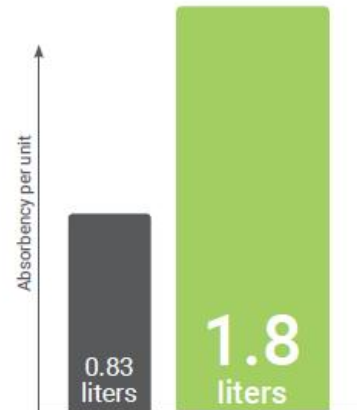
- Your first line of defense in case of oil spill
- Very high absorption: 1 kg absorb up to 50 l of oil
- Fully saturated boom will not leak during replacement



Product	Dimensions, cm	Quantity (bag/bale)	Absorbency per unit/litre	Absorbency (box/litre)
GO 10/3.5–Oil	10 × 350 (Ø 10 cm)	4	27.5	110
GO12.5/3–Oil	12.5 × 300 (Ø 12.5 cm)	4	36	144
GO20/3–Oil	20 × 300 (Ø 20 cm)	4	94	376
GO20/1.5–Oil	20 × 150 (Ø 20 cm)	4	47	188
GO20/5–Oil	20 × 500 (Ø 20 cm)	5	157	785
GO 15/3–Oil	15 × 300 (Ø 15 cm)	4	53	212
GO8/5–Oil	8 × 50 (Ø 8 cm)	20	2.5	50

Absorbnt Pillows

- Use less to absorb more
- Save on waste disposal



Typical PP pad **Green Ocean GO100 pillow**



- Offered in different size, shapes and colors
- Pillows have high capacity and fast-wicking filler to quickly soak up oils
- Light net weight ensures simple installation close to oil spill

Category	Product ID	Dimensions, cm	Quantity (bag/bale)	Absorbency per unit (liter)	Absorbency (box/litre)
Universal Gray	GO120U	45x 45	30	2	60
	GO200U	30 x 45	30	5	150
	GO300U	45x 40	20	10.5	210
	GO100U	30x 20	50	1.8	90
Chemical Yellow	GO120C	45x 45	30	2	60
	GO200C	30x 45	30	5	150
	GO300C	45x 40	20	10.5	210
	GO100C	30x 20	50	1.8	90
Oil Only (White/Blue)	GO120-Oil	45x 45	30	2	60
	GO200-Oil	30 x 45	30	5	150
	GO300-Oil	45x 40	20	10.5	210
	GO100-Oil	30x 20	50	1.8	90

Absorbent Socks

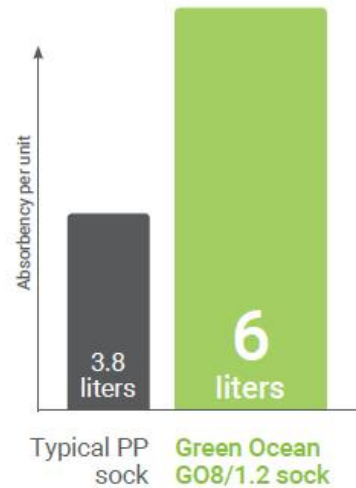


Clean-up
oils, coolants,
solvents and
water-based
fluids

- Formable socks hug corners and surround machine bases to absorb machine leaks
- Green Ocean unique mineral filler ensures maximum absorbency

Socks are offered in two sizes to compile with any equipment:

- 120 cm to use anywhere
- 300 cm for big machine-tools



Category	Product ID	Dimensions, cm	Quantity (bag/bale)	Absorbency per unit/litre	Absorbency (box/litre)
Universal Sock Gray	G08/1.2-U	8 x 120 (Ø 8 cm)	20	6	120
	G08/3-U	8 x 300 (Ø 8 cm)	8	15	120
Chemical Sock Yellow	G08/1.2-C	8 x 120 (Ø 8 cm)	20	6	120
	G08/3-C	8 x 300 (Ø 8 cm)	8	15	120
Oil Only (White/Blue)	G08/1.2-Oil	8 x 120 (Ø 8 cm)	20	6	120
	G08/3-Oil	8 x 300 (Ø 8 cm)	8	15	120

Spill Kit

PORTABLE SPILL KITS



- Compact kits fit in any car, garage or a boat
- Reusable bags
- Portable carry to spill

Product	Pillows	Absorption socks	Granulated absorbent, kg	Total Weight (kg)	Dimensions (cm)	Absorbency (l)
Spill Kit 20	-	1	1	2	45 x 40	20
Spill Kit 30	5	2	0,5	2,5	52 x 26	30
Spill Kit 40	3	2	1	4	90 x 70 x 90	40

STATIONARY SPILL KITS



- Keeps you prepared for massive spills
- Refillable light bags
- Very high absorption capacity of sorbents requires less products in the spill kit, which makes our kits super compact

Product	Pillows	Absorption booms	Absorption socks	Oil Only PP Pads	Granulated absorbent, kg	Absorbent Rags 10 kg	Total Weight (kg)	Dimensions (cm)	Absorbency (l)
Spill Kit 300	15	8	3	-	3	-	15	60 x 60	300
Spill Kit 500	10	8	4	-	6	1	50	90 x 70 x 90	500
Spill Kit 750	-	16	12	365	3	1	150	100 x 120 x 80	750

Lifebuoy for any SPILL



- Unhook it to use it as a sock
- Open the side zipper pocket to use absorbent pillows

LIFEBUOY FOR ANY SPILL



UNIVERSAL

Absorbs water-based
oil-based liquids



CHEMICAL

Absorbs chemicals



OIL ONLY

Absorbs all kind of
oils

Absorbs
20 liters!

Product	Pillow	Sock	Weight (kg)	Size (cm)	Absorbency (l)
Lifebuoy 20L	8	1	0,63	10 × 120	20

LIFEBUOY FOR MAJOR SPILLS



UNIVERSAL

Absorbs water-based
oil-based liquids



CHEMICAL

Absorbs chemicals



OIL ONLY

Absorbs all kind of
oils

Absorbs
50 liters!

Product	Pillow GO200	Pillow GO100	Sock	Weight (kg)	Size (cm)	Absorbency (l)
Lifebuoy 50L	4	8	3	4	13 × 300	50

Other solutions



Trailer



Pros

- ◉ Environment-friendly;
- ◉ Works fast;
- ◉ Works dust-free;
- ◉ Absorbs oil products and doesn't leak;
- ◉ Easier to handle;
- ◉ Adaptable for the most of the situations.

THANK YOU FOR YOUR ATTENTION!



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