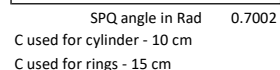


Surface area calculation from ROV-data

	Mean	SD
Intact object without accounting the sediment	6.1732	0.9541
	= 6.17 ± 0.95 m²	

Total (unburied part)	3.8835	4.9488	* assumed that the dissolved part of the explosives above is flat
Surface area of a half-dissolved item	4.4162	0.7533	
	= 4.42 ±0.75 m²		

Total (unburied part)	3.3899	4.0290
Surface area of a fully dissolved item	3.7094	0.4519
	$= 3.71 \pm 0.45 \text{ m}^2$	

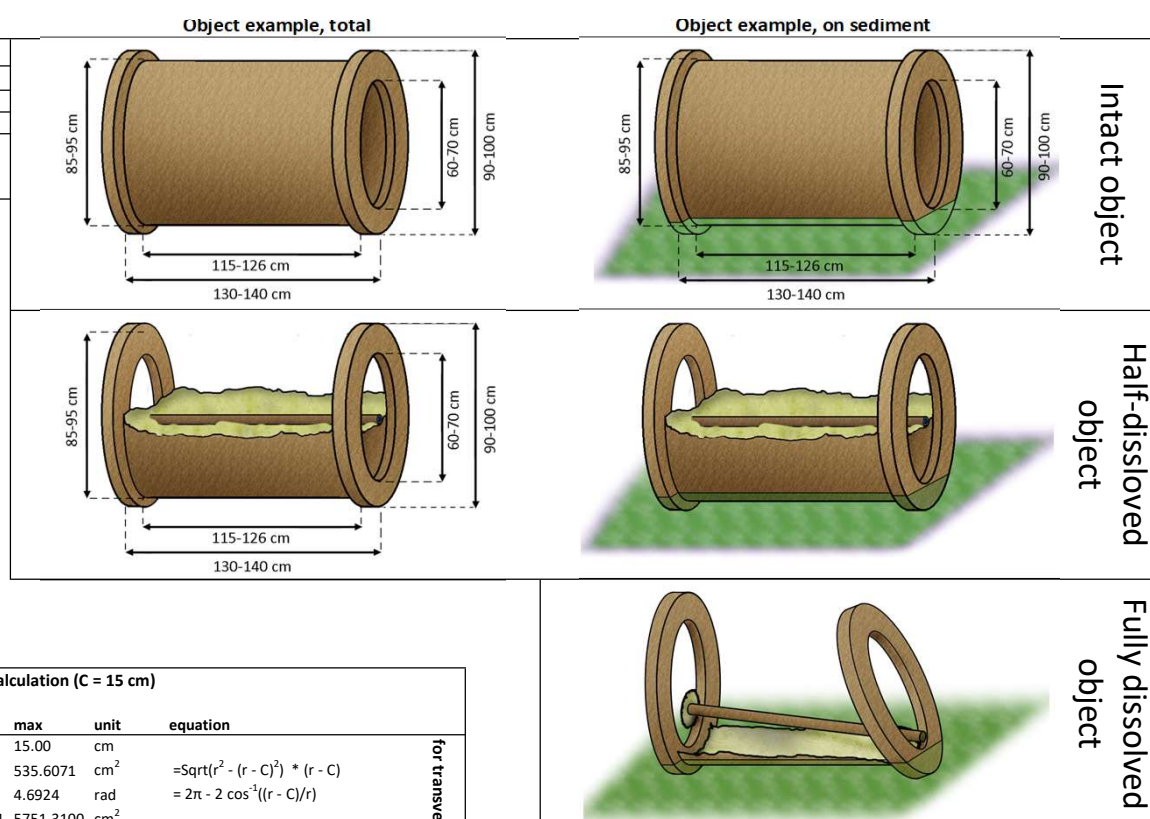


sin SPQ angle	0.6444
RQ, cm	54.7723

Buried ring side calculation (C = 15 cm)					for transverse cut (scheme from the left)
	min	max	unit	equation	
C:	15.00	15.00	cm		
the area of triangle ORP:	503.1153	535.6071	cm ²	$= \text{Sqrt}(r^2 - (r - C)^2) * (r - C)$	
2π - the angle θ:	4.6010	4.6924	rad	$= 2\pi - 2 \cos^{-1}((r - C)/r)$	
Sector area:	4658.5611	5751.3100	cm ²		
Total side area:	0.6362	0.7854	m ²		
Unburied side area:	0.5162	0.6287	m ²		
Buried side area:	0.1200	0.1567	m ²		
Arc unburied:	207.0472	234.6194	cm		
Arc buried:	75.6962	79.5399	cm		
Arc total:	282.7433	314.1593	cm		
Area of outer Ring unburied:	0.1242	0.1642	m ²		for 3D object
Area of outer Ring buried:	0.0454	0.0557	m ²		
Area of both rings buried:	0.3727	0.4248	m ²		

Buried: cylinder side calculation (C = 10 cm)					for transverse cut (scheme from the left)
	min	max	unit	equation	
C:	10.00	10.00	cm		
the area of triangle QRP:	273.8613	291.5476	cm ²	= $\text{Sqrt}(r^2 - (r - C)^2) * (r - C)$	
2π - the angle θ:	4.8828	4.9615	rad	= $2\pi - 2 \cos^{-1}((r - C)/r)$	
Sector area:	4409.7446	5508.3661	cm ²		
Total area:	0.5675	0.7088	m ²		
Unburied area:	0.4684	0.5800	m ²		
Buried area:	0.0991	0.1288	m ²		
Arc unburied:	207.5174	235.6710	cm		
Arc buried:	59.5180	62.7803	cm		
Arc total:	267.0354	298.4513	cm		
Surface area of cylinder unburied:	2.3865	2.9695	m ²		
Area of cylinder buried:	0.6845	0.7910	m ²		

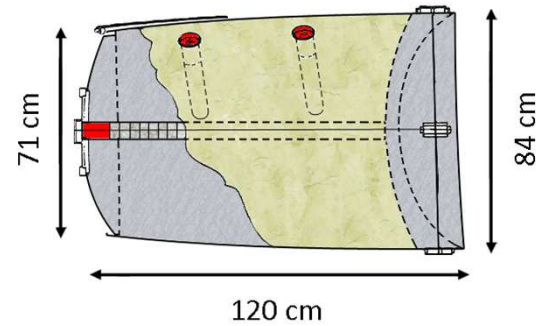
for 3D object



Theoretical surface area calculation for a warhead

	inches	mm
wall thickness	0.05	1.27
long	47	1193.8
diameter forward	28	711.2
diameter aft	33	838.2
	lb	kg
weight	1870	848.232
case/exploder weight	113	51.2568

from: 'The Flying Bomb', Richard Anthony Young, pp. 133-4.



Surface area of the warhead

Lateral	2.909568
Top	0.397259
Bottom	0.551804

Surface area (m²): 3.858631

Surface area of a truncated cone

R for the radius of the base (larger circle);
r for the radius of the top surface (smaller circle);
h for the height, i.e., the shortest perpendicular distance between the two circles; and
s for the slant height, i.e., the distance between the two circles measured along the lateral face.

Volume formula:

$$V = (1/3) \times \pi \times h \times (r^2 + r \times R + R^2).$$

Slant height formula:

$$s = \sqrt{(R - r)^2 + h^2}.$$

Lateral surface area formula:

$$\text{Lateral} = \pi \times (R + r) \times s.$$

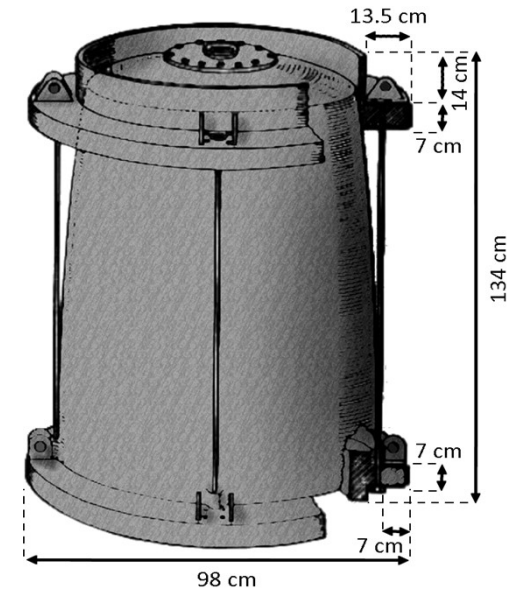
Top and bottom surface area:

$$\text{Top} = \pi \times r^2 \text{ and } \text{Bottom} = \pi \times R^2.$$

Total area formula:

$$\text{Total} = \text{Lateral} + \text{Top} + \text{Bottom}.$$

Theoretical surface area calculation for a warhead + transporting device



from: [FZG 67 Geräte-Handbuch 1944](#)

Surface area of the warhead and transporting device combined

Cylinder	3.724016694
Hoops	2.158902472

Total surface area (m²): 5.882919166

Sea-dumped munitions in the Baltic Sea are a hotspot of epifauna abundance and diversity

Supplementary material 2

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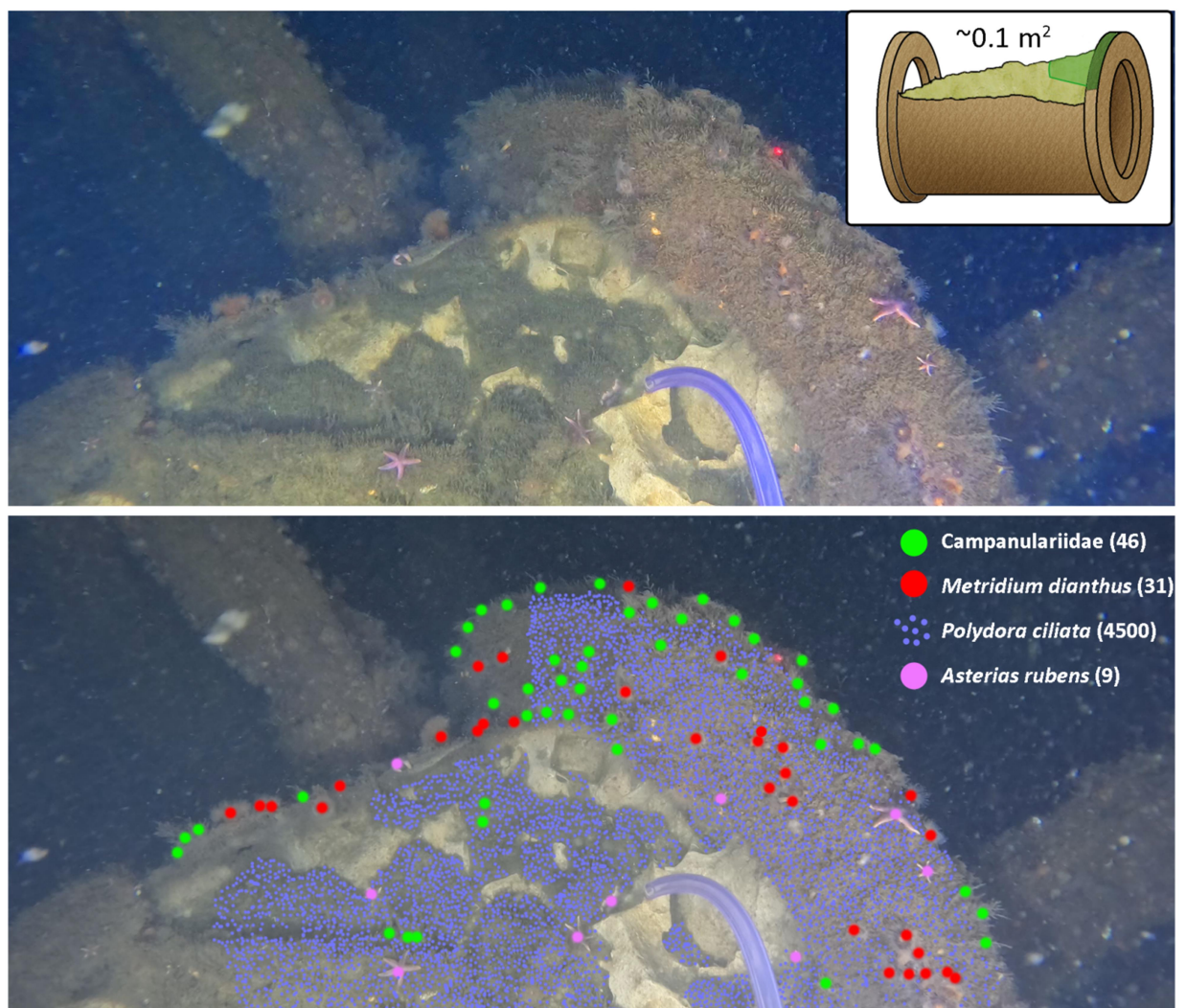


Fig. S1. Counted organisms on the close-observation of Item 4. Above – original screenshot with scheme of the object area observed; below – marked individuals of four species visible. On this Item a lot of *Polydora ciliata* are visible on the explosive, possibly due to accumulation of sediment in the crevices.

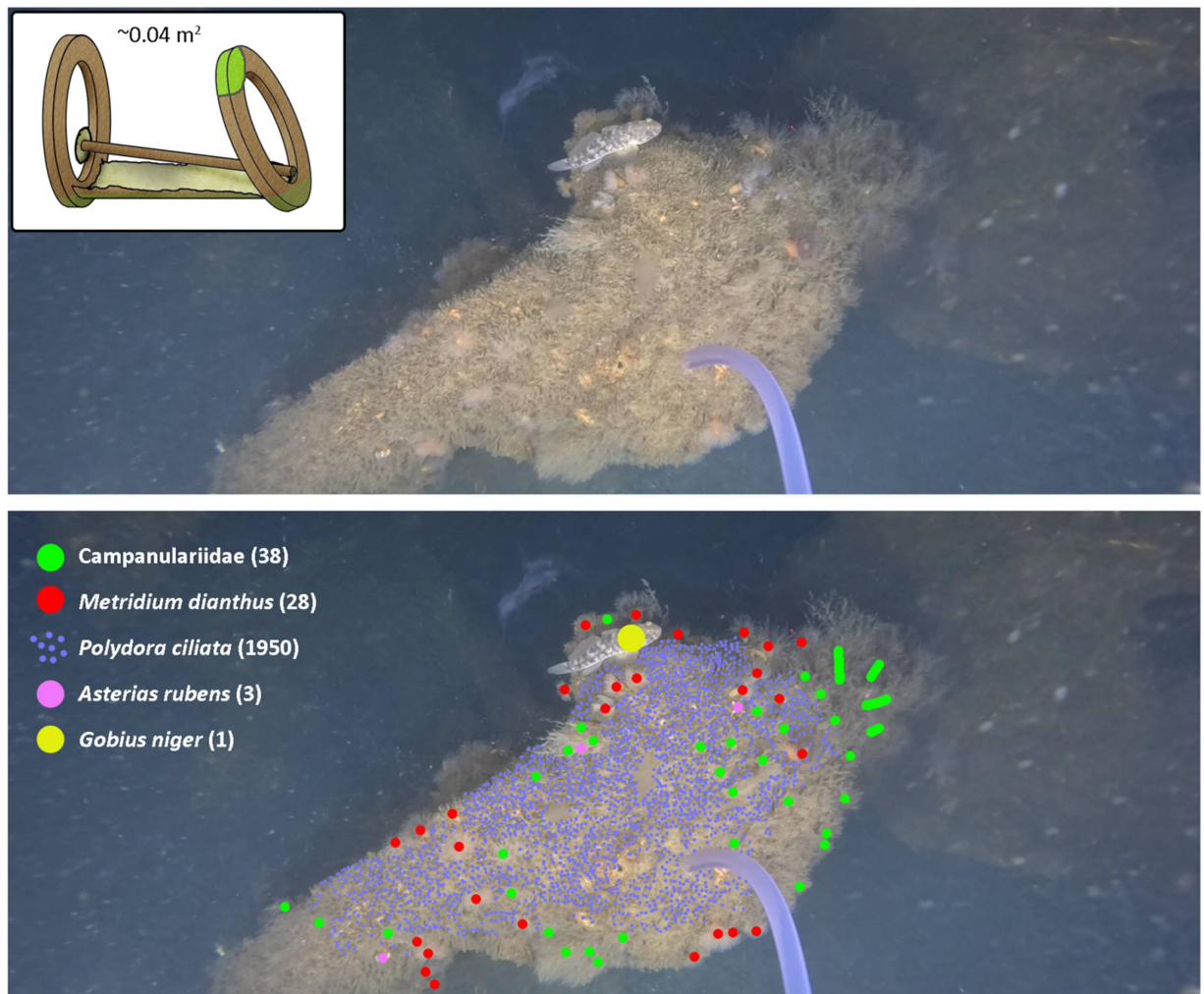


Fig. S2. Counted organisms on the close-observation of Item 5. Above – original screenshot with scheme of the object area observed; below – marked individuals of five species visible.

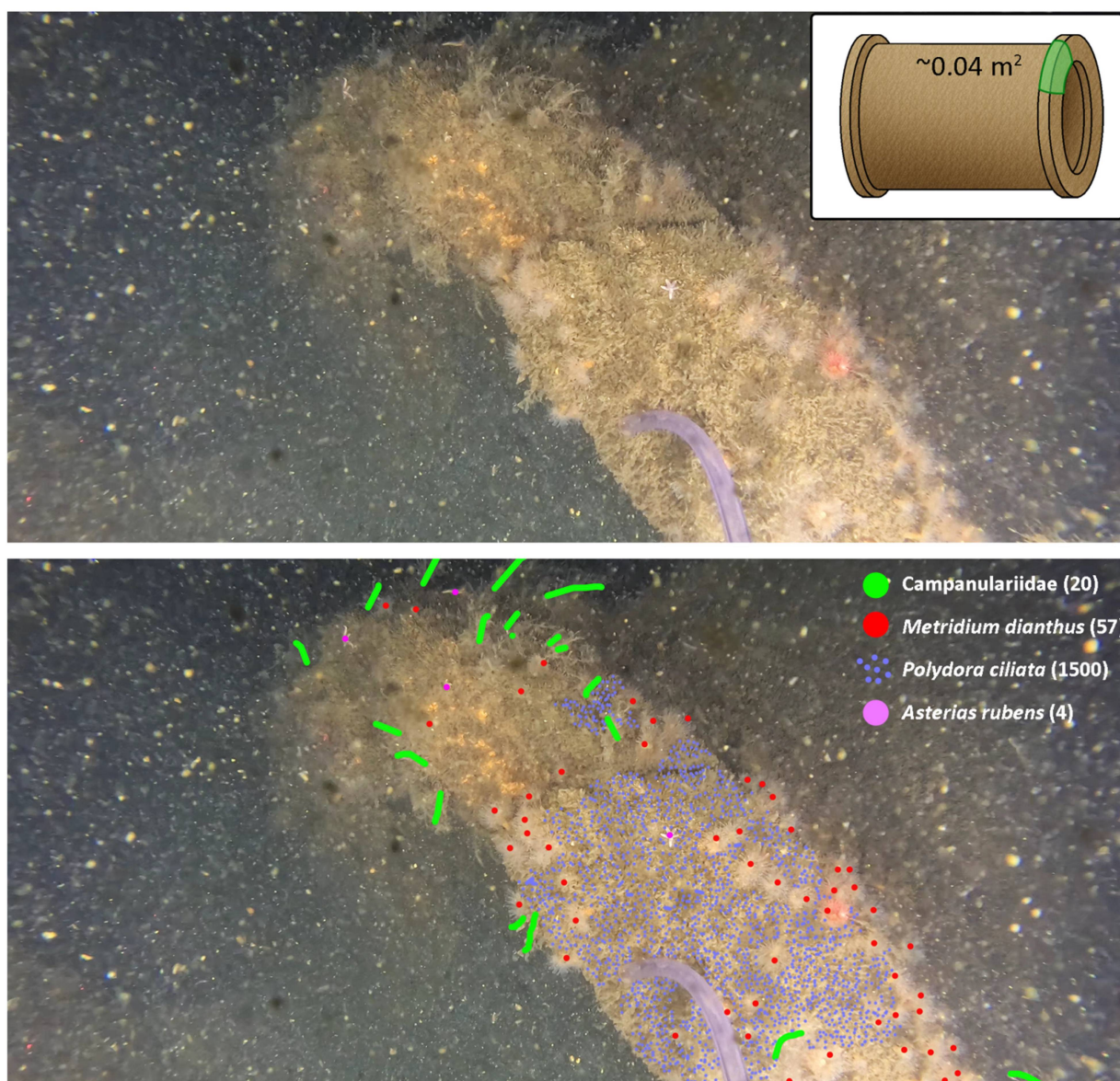


Fig. S3. Counted organisms on the close-observation of Item 7. Above – original screenshot with scheme of the object area observed; below – marked individuals of four species visible.

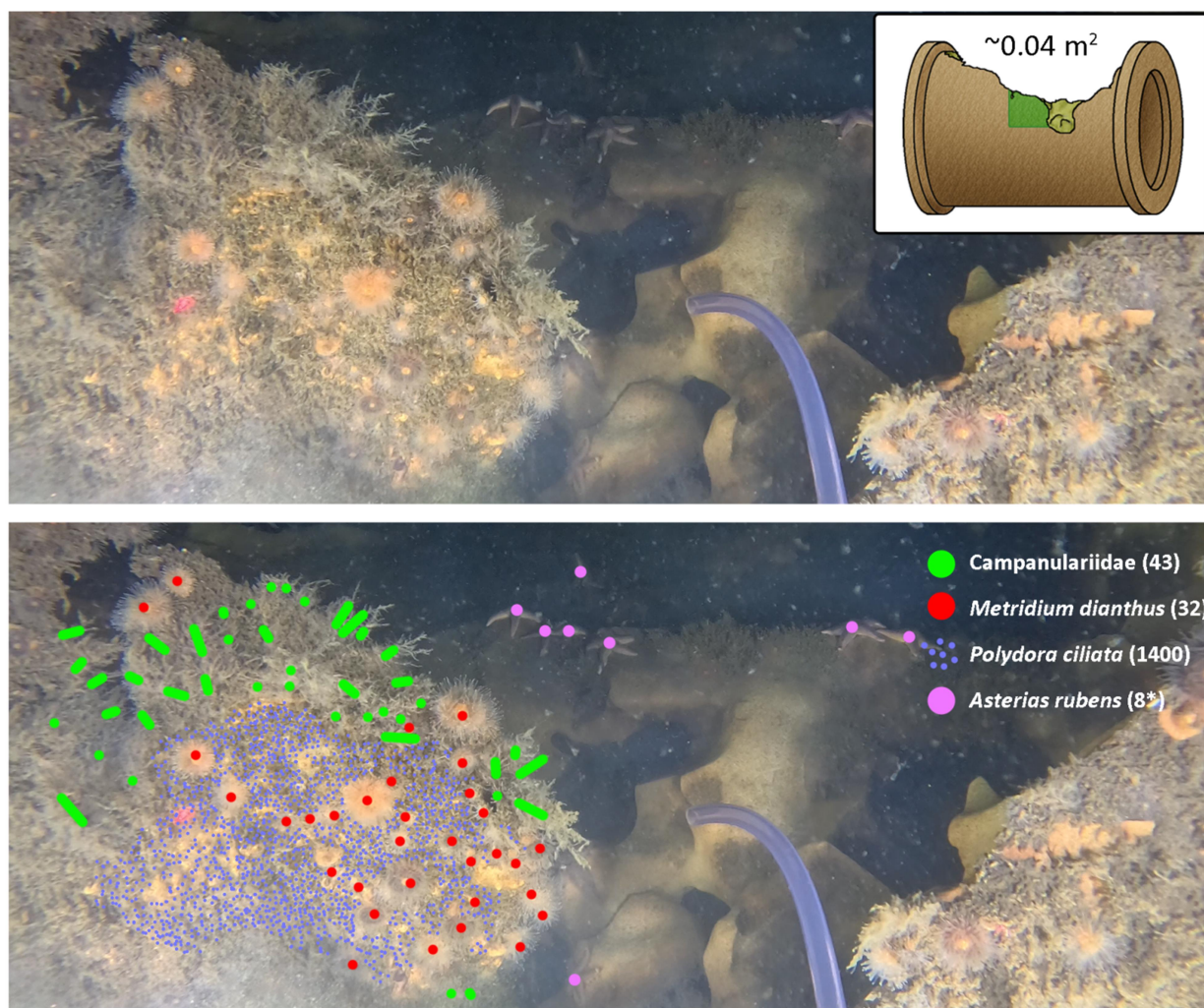


Fig. S4. Counted organisms on the close-observation of Item 8. Above – original screenshot with scheme of the object area observed; below – marked individuals of four species visible. Starfishes were not included to the data, as they only occurred on the distant part of the screenshot (one on the bare explosive below, and seven on the exposed fuse above).

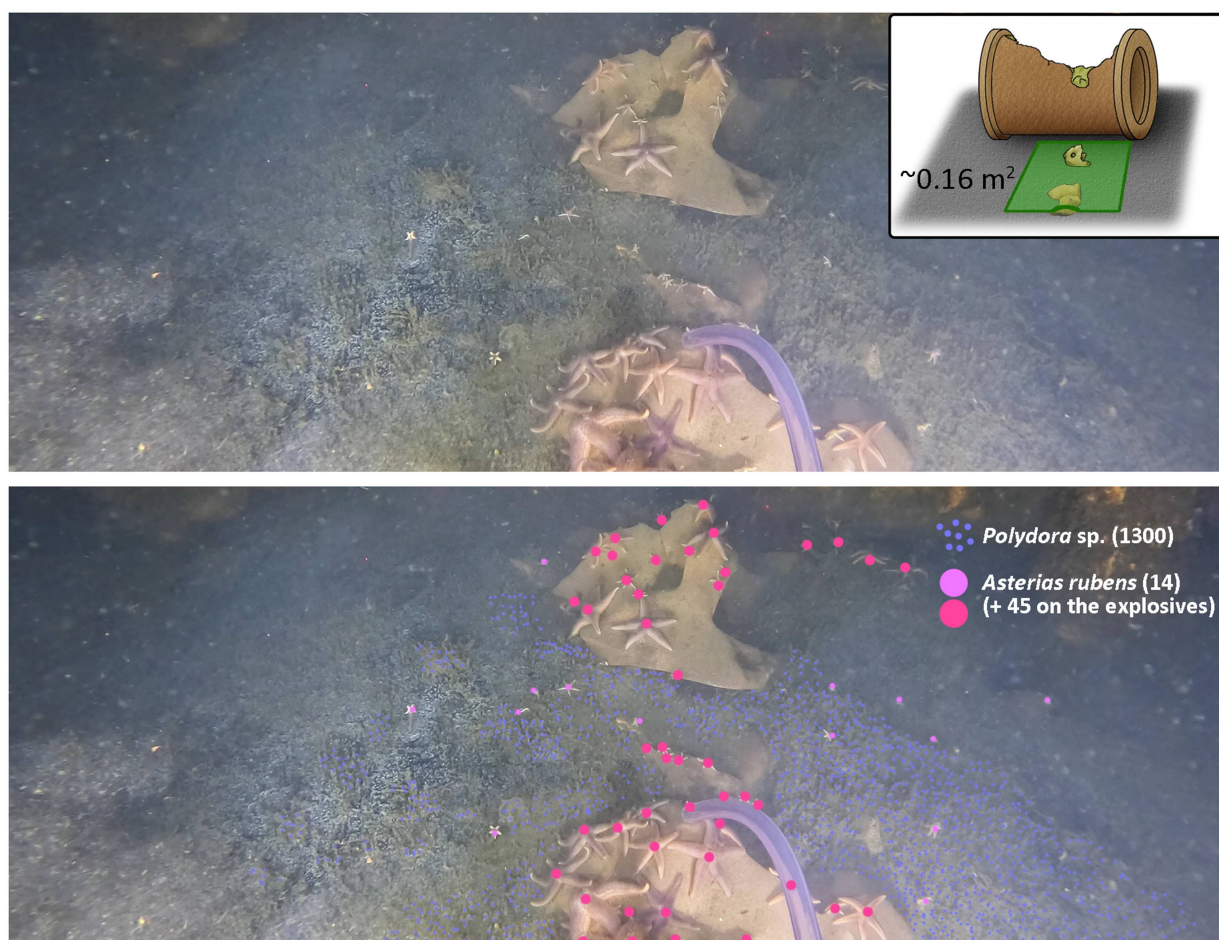


Fig. S5. Counted organisms on the close-observation of Track 2 (near Item 8). Above – original screenshot with scheme of the object area observed; below – marked individuals of two species visible.