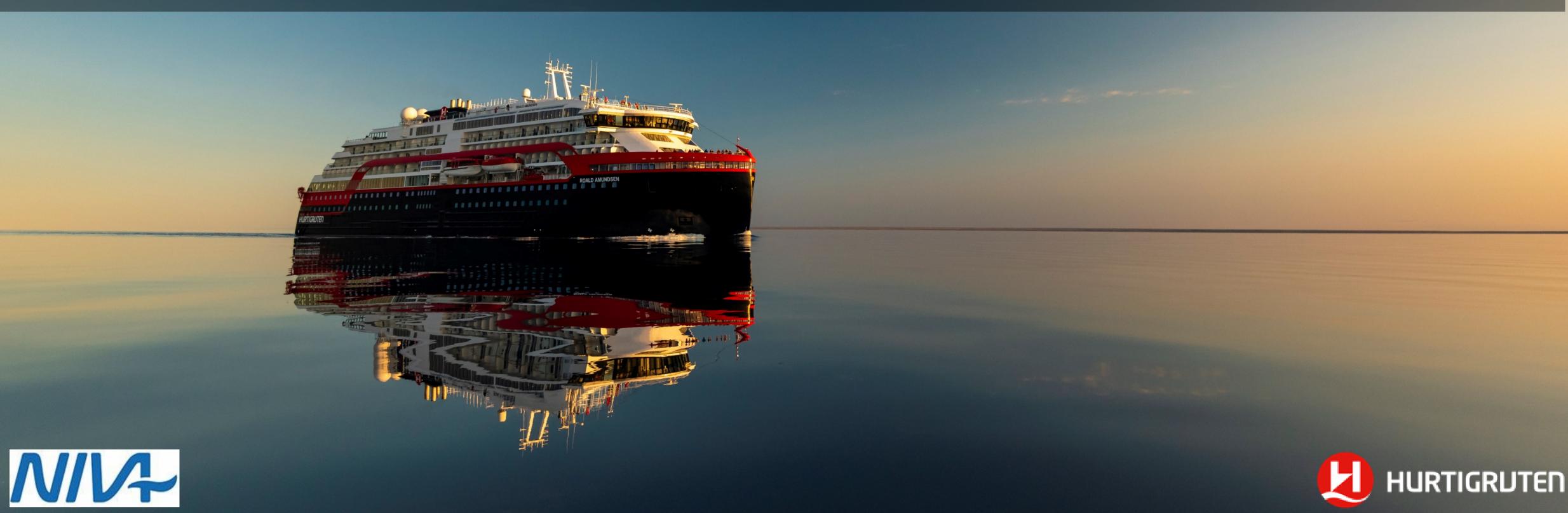




### NIVA & HURTIGRUTEN PARTNERSHIP Bringing light to the gaps in plastic marine litter knowledge

### VERENA MERALDI, TUDOR MORGAN, BERT VAN BAVEL





## SINGLE USE PLASTIC BAN







### BEACHCLEAN-UPS





### Association of Arctic Expedition Cruise Operators AECCO



### CITIZEN SCIENCE





### CARCAS ISLAND, FALKLANDS BEACH CLEANING



Personal care products 0.6% Other: 7.1% Balloons Straws 0.5% 2.0%

Cups (including polystyrene/foamed plasti 0.8%

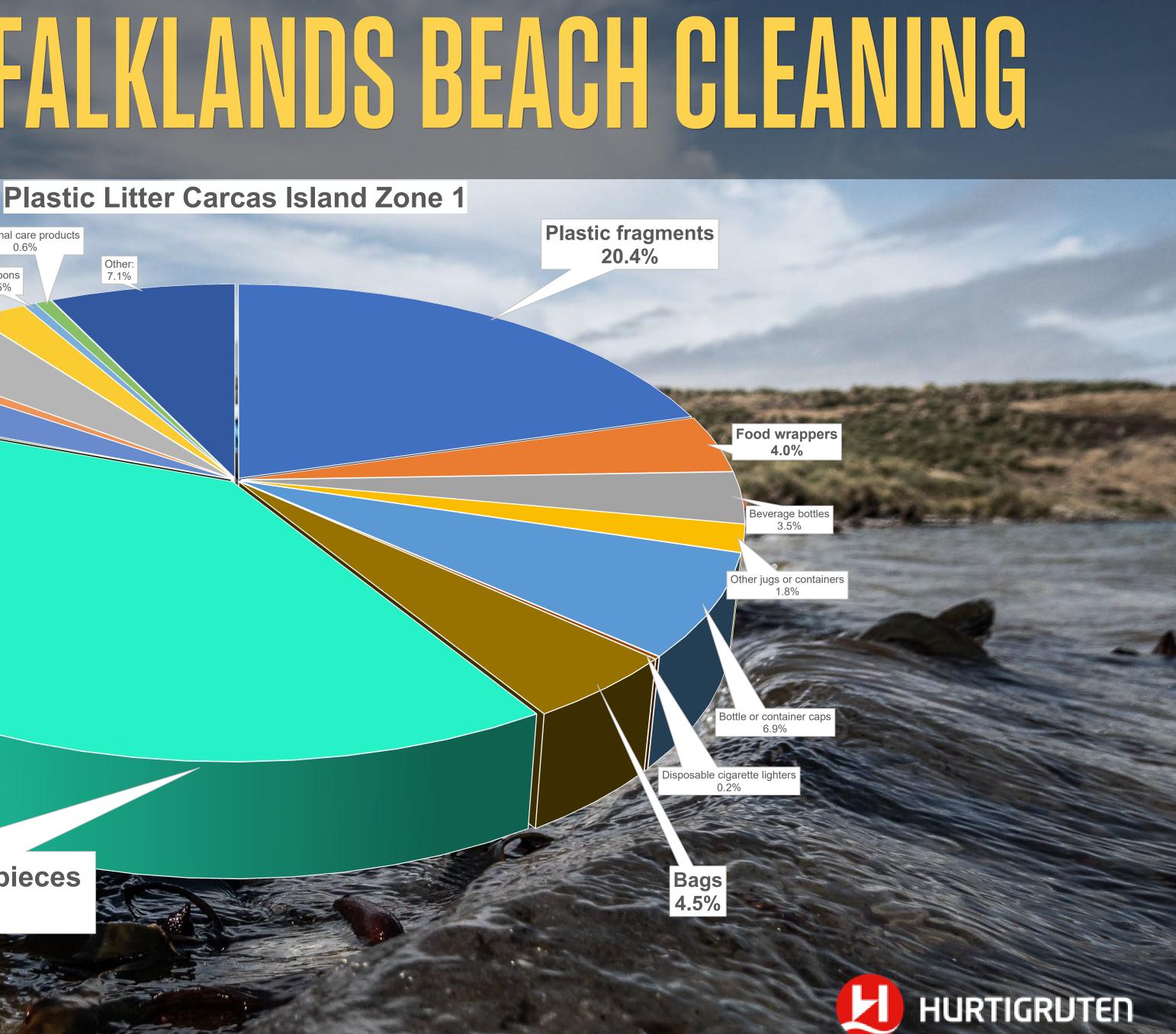
**Plastic utensils** 

4.5%

Fishing lures & li 3.7%

Plastic rope/small net pieces 39.5%









## UUEKN KESEAKGE PLA FU

### Modul 6. Console for Ocean Literacy Touch screens displaying observational data and ocean related "key stories"

### Modul x: Towed/hull-mounted observations

Towed plankton collector (CPR) profiling sensors (XBT), acoustic current meters (ADCP). Ofte 3dje part

### Modul 0: FerryBox system

Clean seawater intake, pipes, pumps, computer, electronics, network

NIA

Modul 1: FerryBox standard sensors Inlet temperature, Salinity, temperature, Oxygen

HURTIGRUTEN



Modul 7: Metrological and atmospheric observations Metrological variables of wind

direction and strength

### Modul 8: Advanced above water observations

Light sensors, sea surface skin temperature, downwardfacing sensors for Ocean Colour

### Modul 5. Laboratory

Ranging from proper labs, small lab benches, to citizen science labs. Used for advanced sensors (Flowcytometry, Nutrients)

Modul 2: FerryBox optical sensors Chlorophyll a, cDOM, turbidity, Phycocyanin

Modul 3. FerryBox carbon sensors pCO<sub>2</sub>, pH, Alkalinity,

Modul 4: FerryBox advanced <u>samplers</u> Water sampler, microplastics, contaminants, sample filter collector





## MIGROPLASTIC SAMPLER

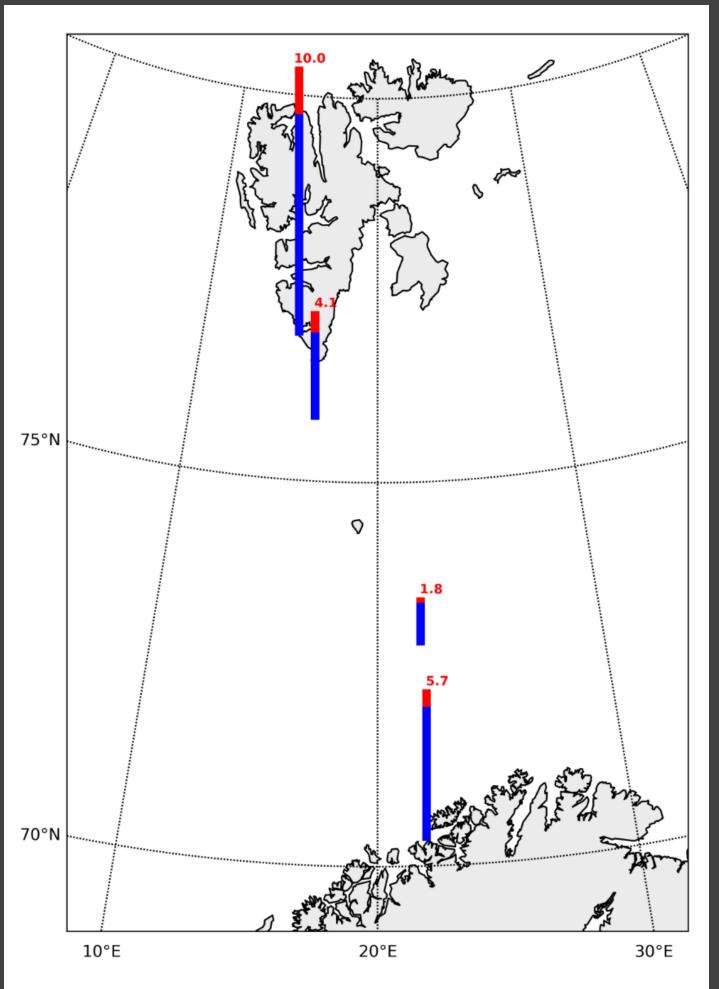
0







## MCROPLASTIC IN THE ARCTIC

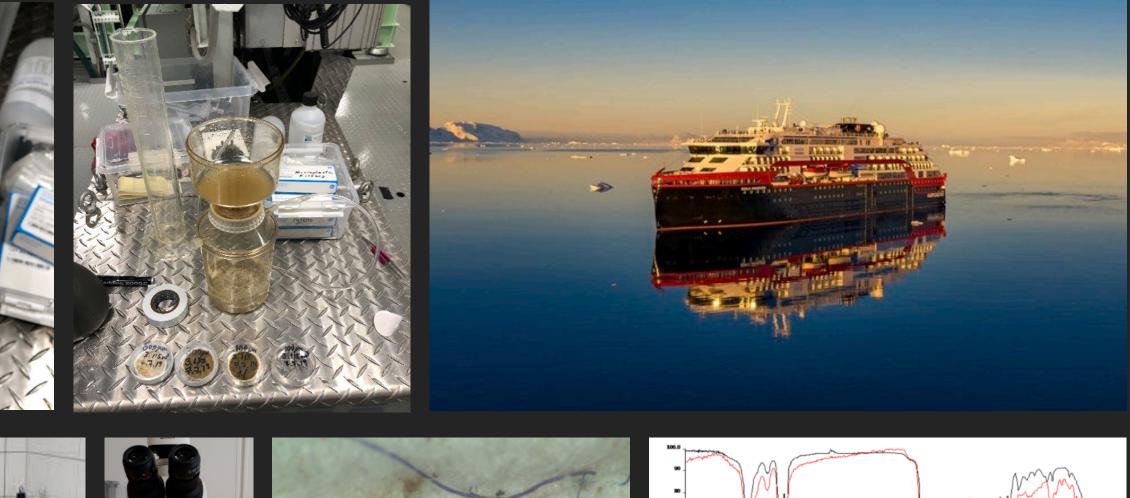




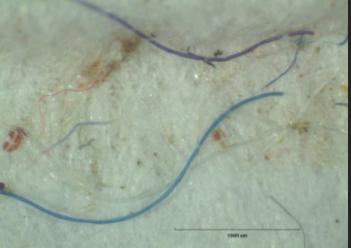


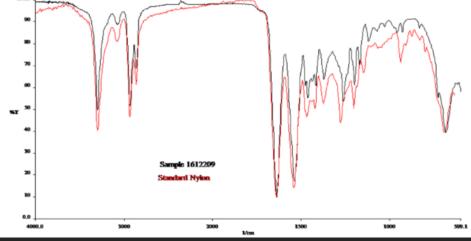


### Total number of plastic, 5.4 n/m<sup>3</sup> Fragments 0.9 n/m<sup>3</sup> Fibers 4.5 n/m<sup>3</sup>





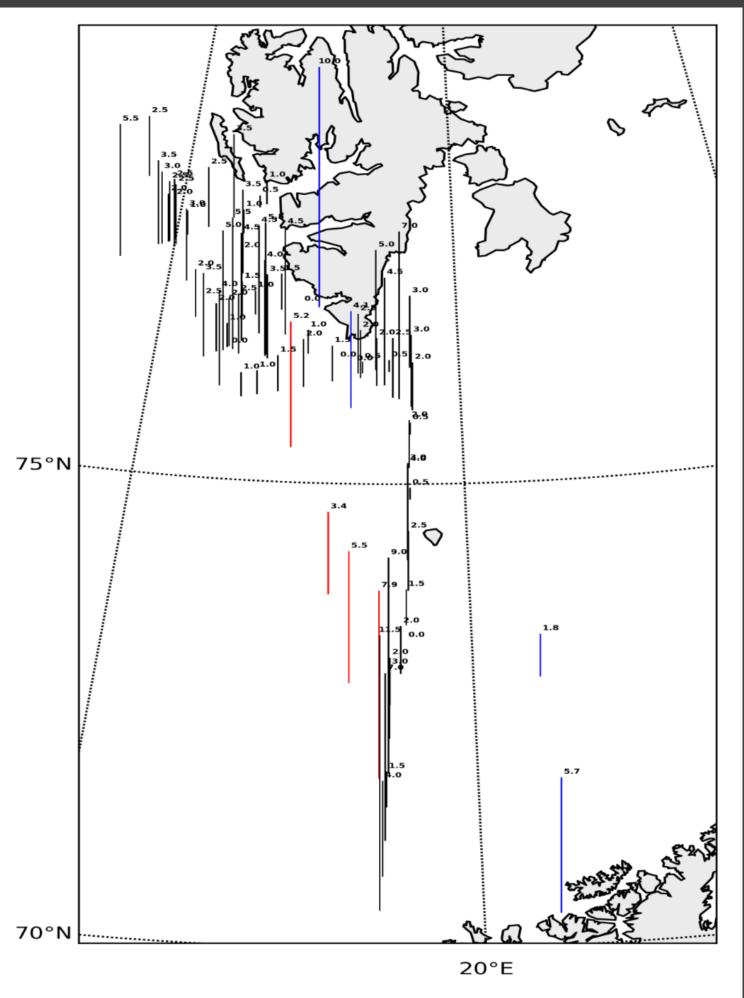








## 



NIV



### SCIENTIFIC **Reports**

### **OPEN**

Microplastics in Arctic polar waters: the first reported values of particles in surface and sub-surface samples

Received: 18 June 2015 Accepted: 07 September 2015 Published: 08 October 2019

Amy L. Lusher<sup>1</sup>, Valentina Tirelli<sup>2</sup>, Ian O'Connor<sup>1</sup> & Rick Officer<sup>1</sup>

Plastic, as a form of marine litter, is found in varying quantities and sizes around the globe from surface waters to deep-sea sediments. Identifying patterns of microplastic distribution will benefit an understanding of the scale of their potential effect on the environment and organisms. As sea

### Total number of plastic, n/m<sup>3</sup>

**Tromsö-Svalbard Tromsö-Svalbard** 

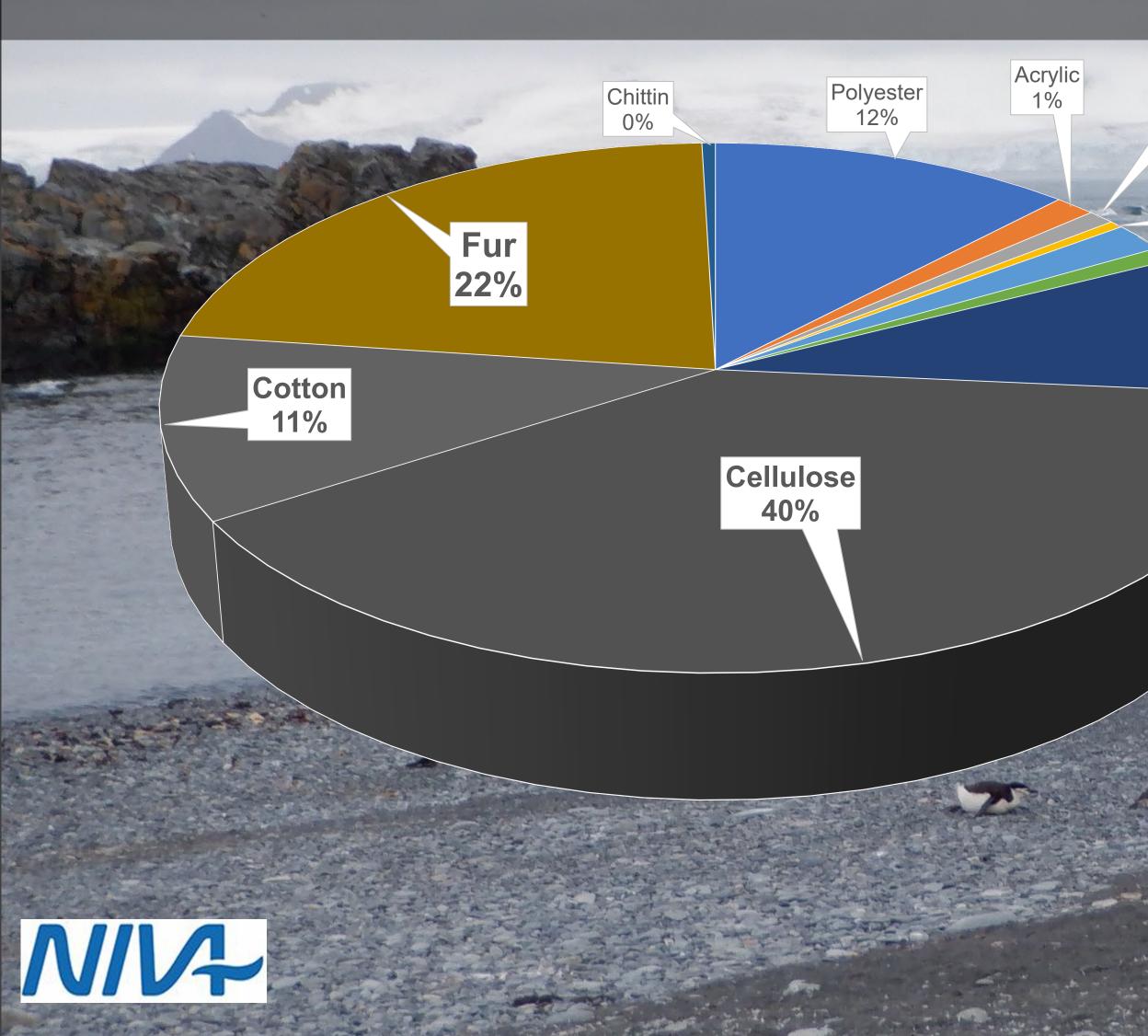
**Research Vessel** (Lusher et al.) **Russian Arctic** 

- av 5.4, min 1.8, max 10.0 - av 5.5, min 3.4, max 7.9

- av 2.7, min 0, max 11.5 - av 1.6, min 0.2, max 3.6



## MIGROPLASTIC IN ANTARCTICA 300-2000 µM



Fluor polymer

Polyamide

1%

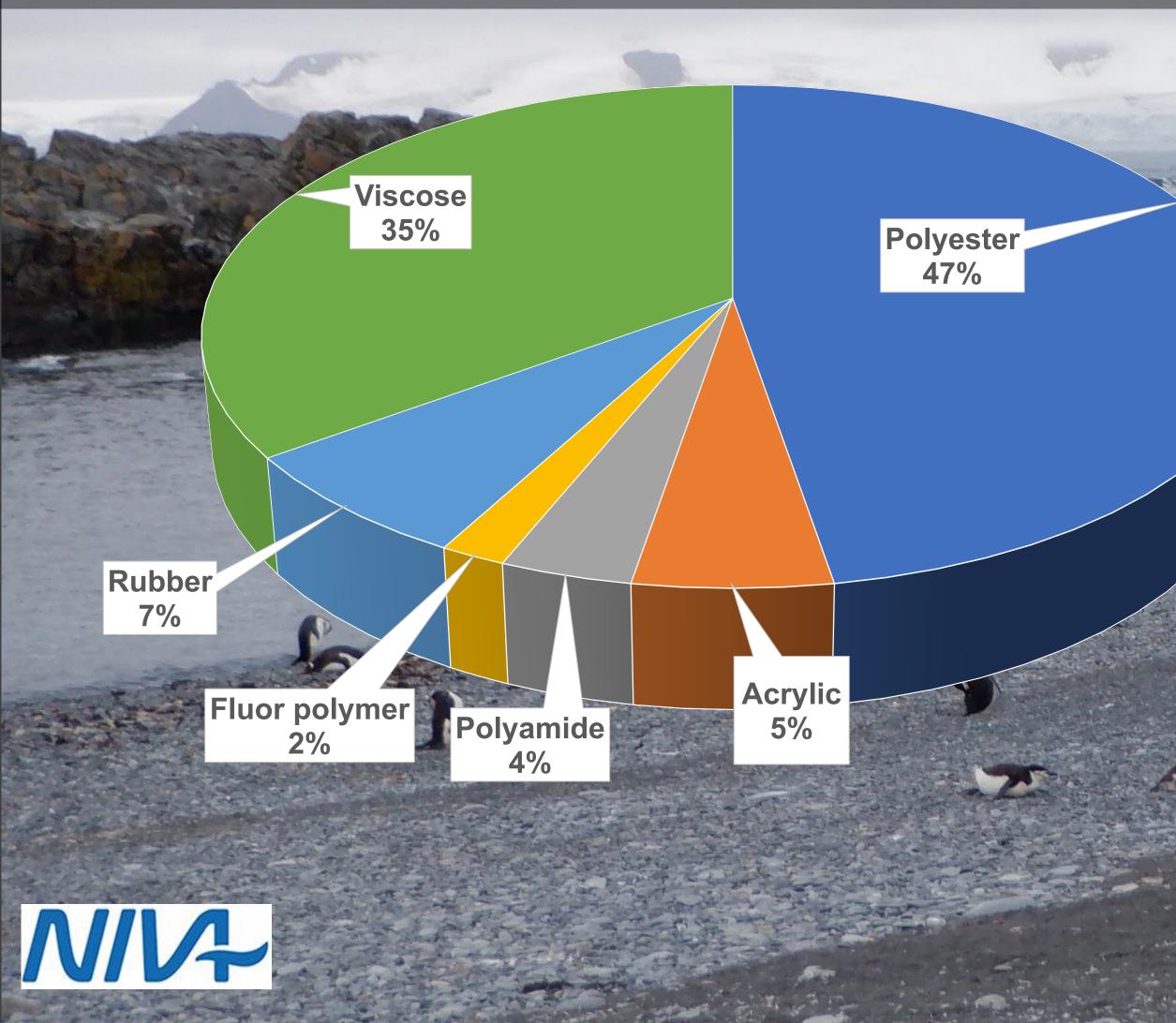
Other 1%

Viscose

Most fibers from natural origin • Cellulose Based Fibers • Cotton Fibers • Biological Fur Fibers



## MICROPLASTIC IN ANTARCTICA



# Plastics Polyester Fibers Viscose Fibers Rubber particles





## MICROPLASTIC IN ANTARCTICA 300-2000 µM

13

1000 um

Fibres Date 2020-02-08 2020-02-07 2020-02-06 2020-01-11 2020-01-06 2020-01-01 Average

**n/m3** 2.39 1.79 4.55 2.32 3.70 3.55 3.05





Microplastics Date 2020-02-08 0.00041 2020-02-07 0.00041 2020-02-06 2020-01-11 2020-01-06 2020-01-01 Average

n/m30.00089 0.00017 0.00077 0.00044 0.00051

HURTIGRUTEN

