



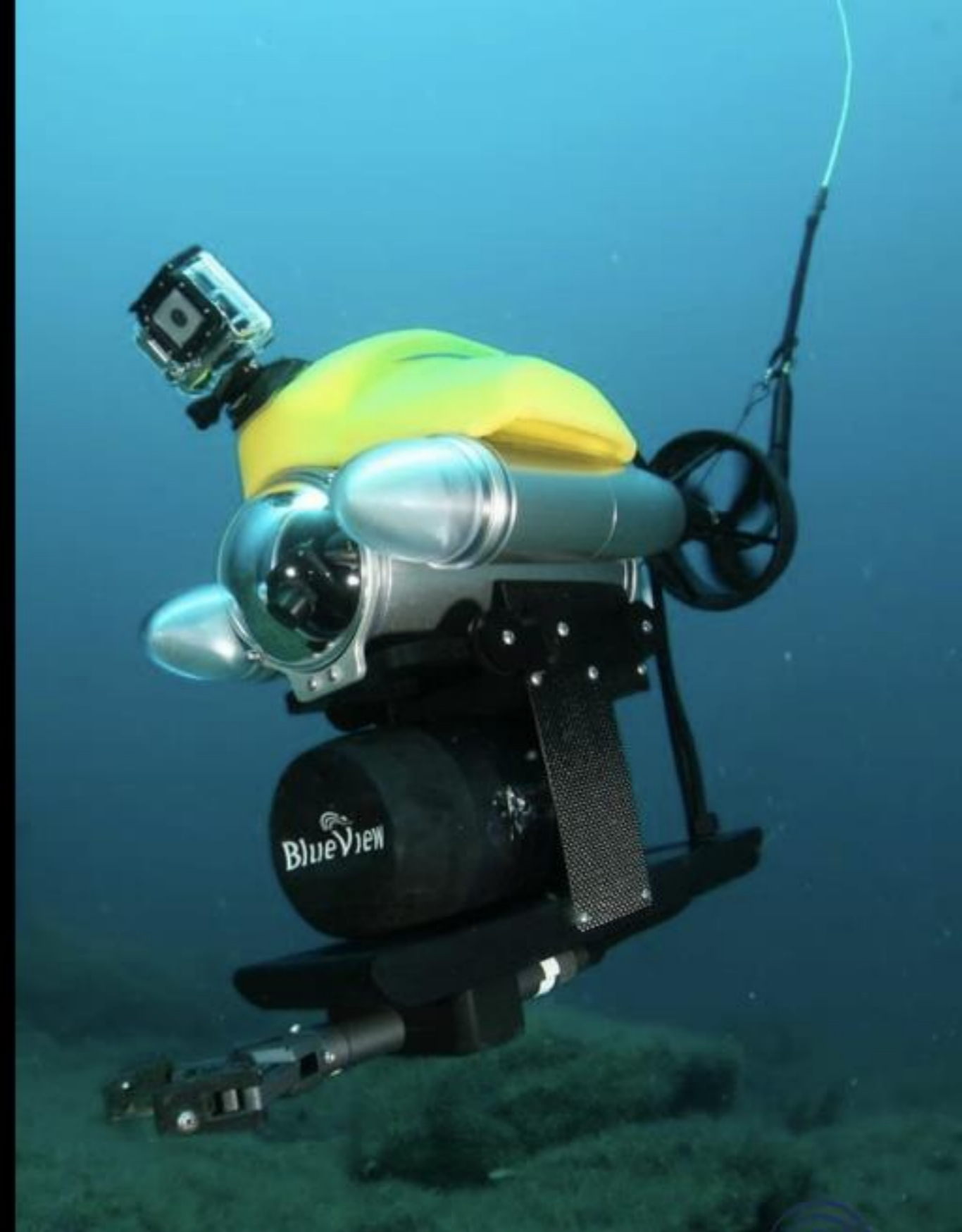
Rachael Z. Miller  
Rozalia Project  
Cora Ball

# Rozalia Project:

**Our mission is to clean and protect the ocean and conserve a healthy, thriving marine ecosystem.**



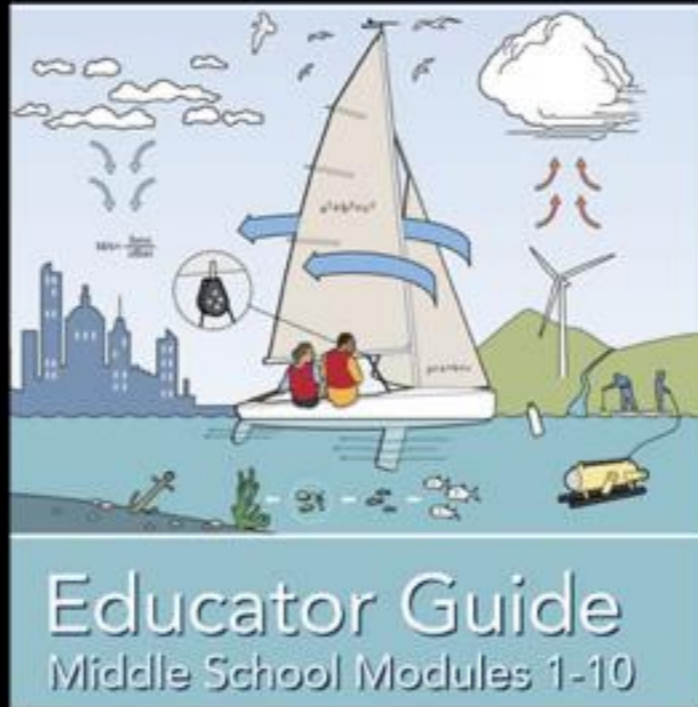
**MULTIPLE ANGLES**



# SURFACE TO SEAFLOOR



# URBAN AND COASTAL WATERS



**GREAT PARTNERSHIPS**



American  
Promise  
Rockland, ME



American Promise  
Oceanographic Research Vessel





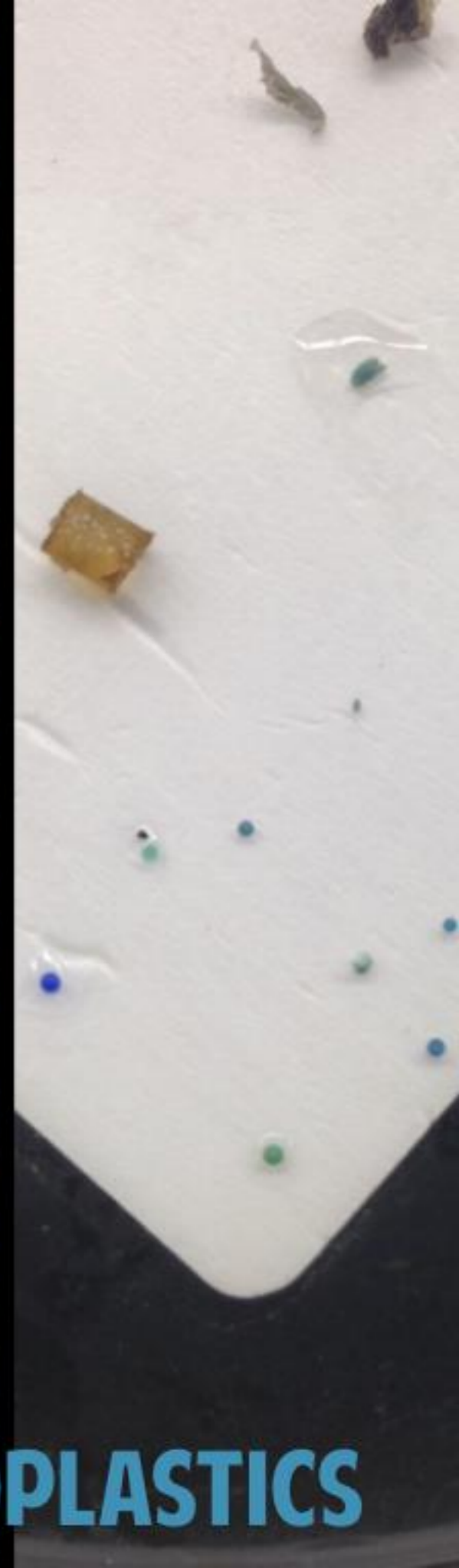
**DFG**



**CONSUMER DEBRIS**

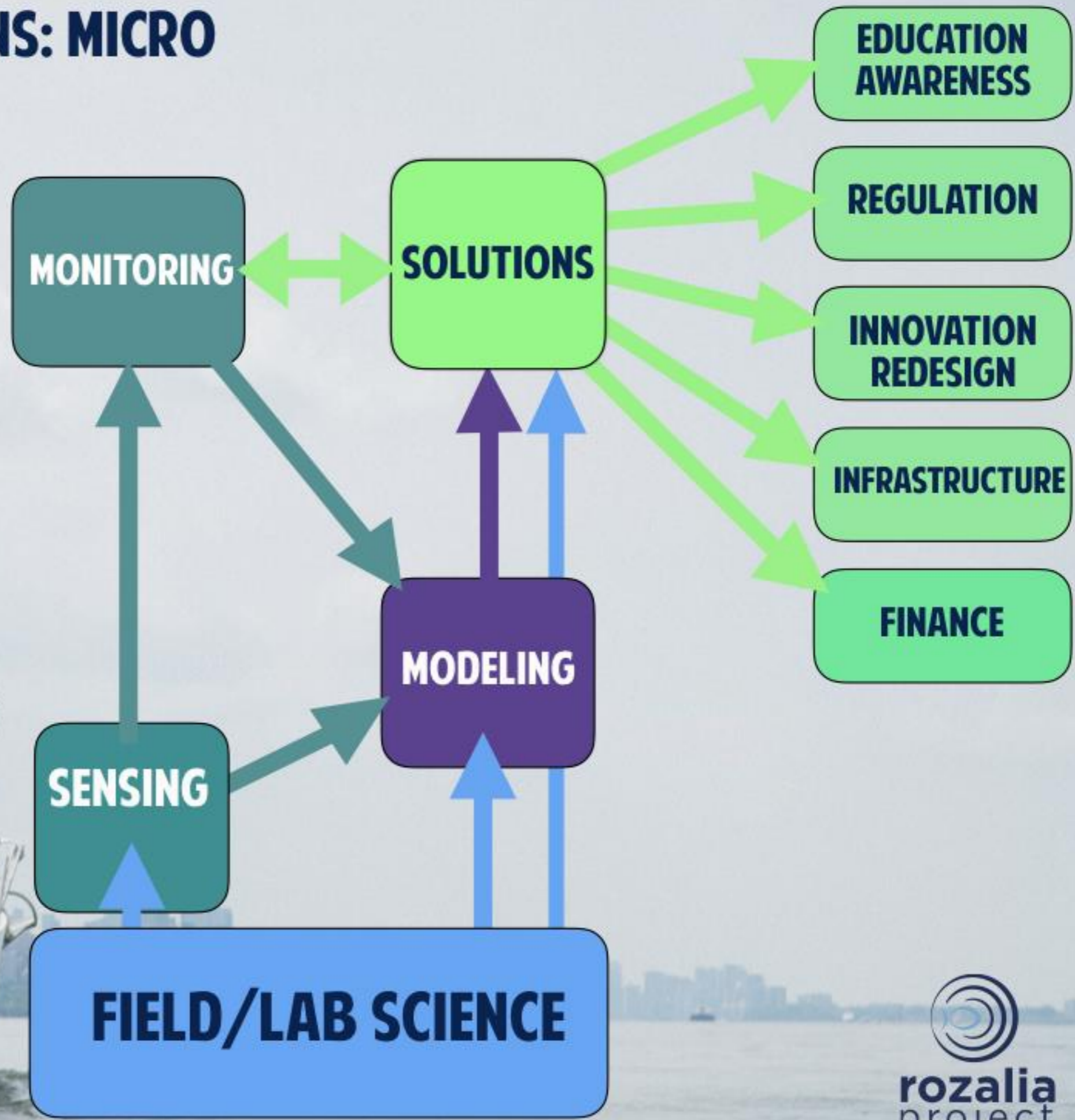


**MICROPLASTICS**



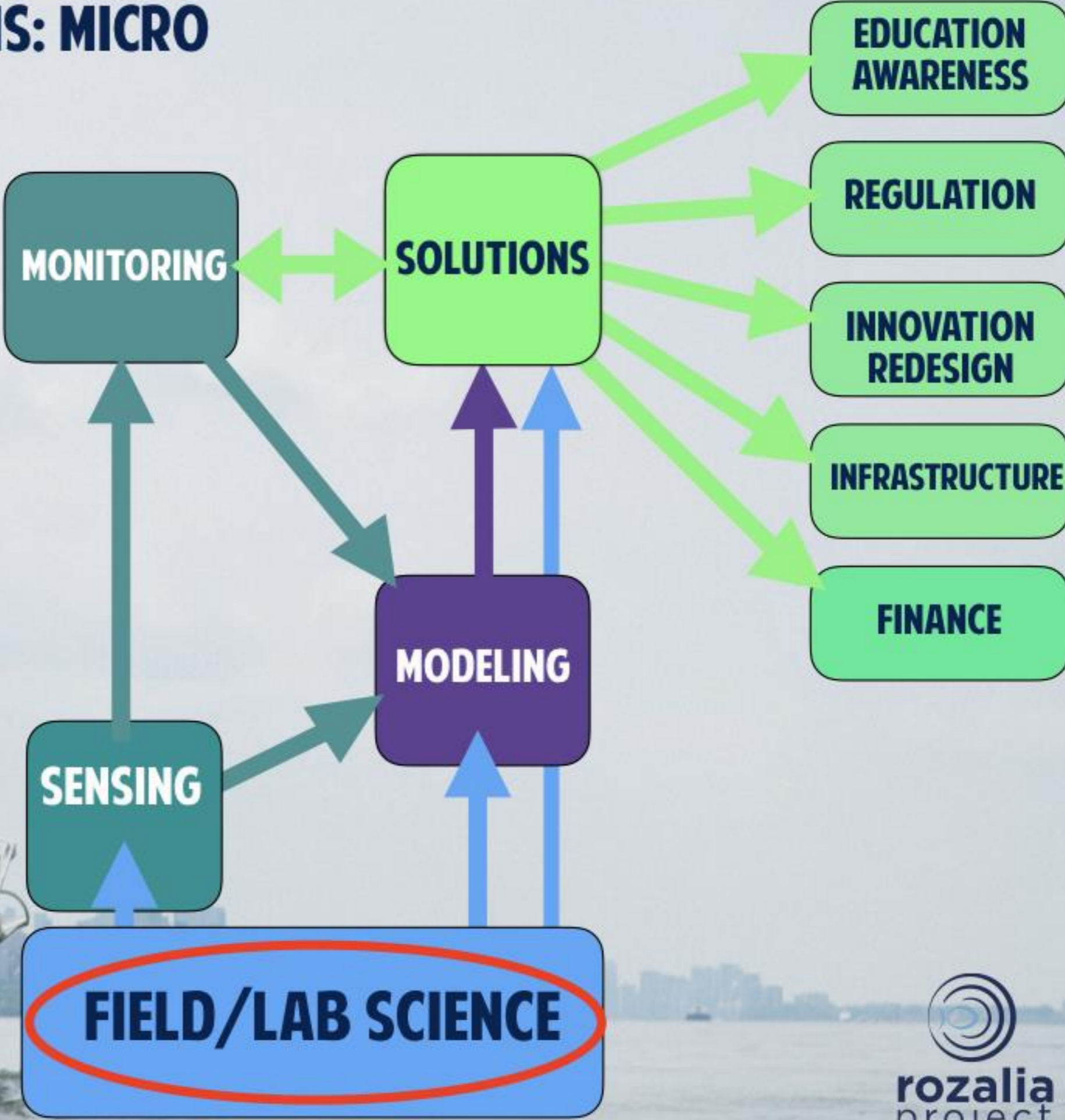


# PATHS TO SOLUTIONS: MICRO AND NANOPLASTIC POLLUTION

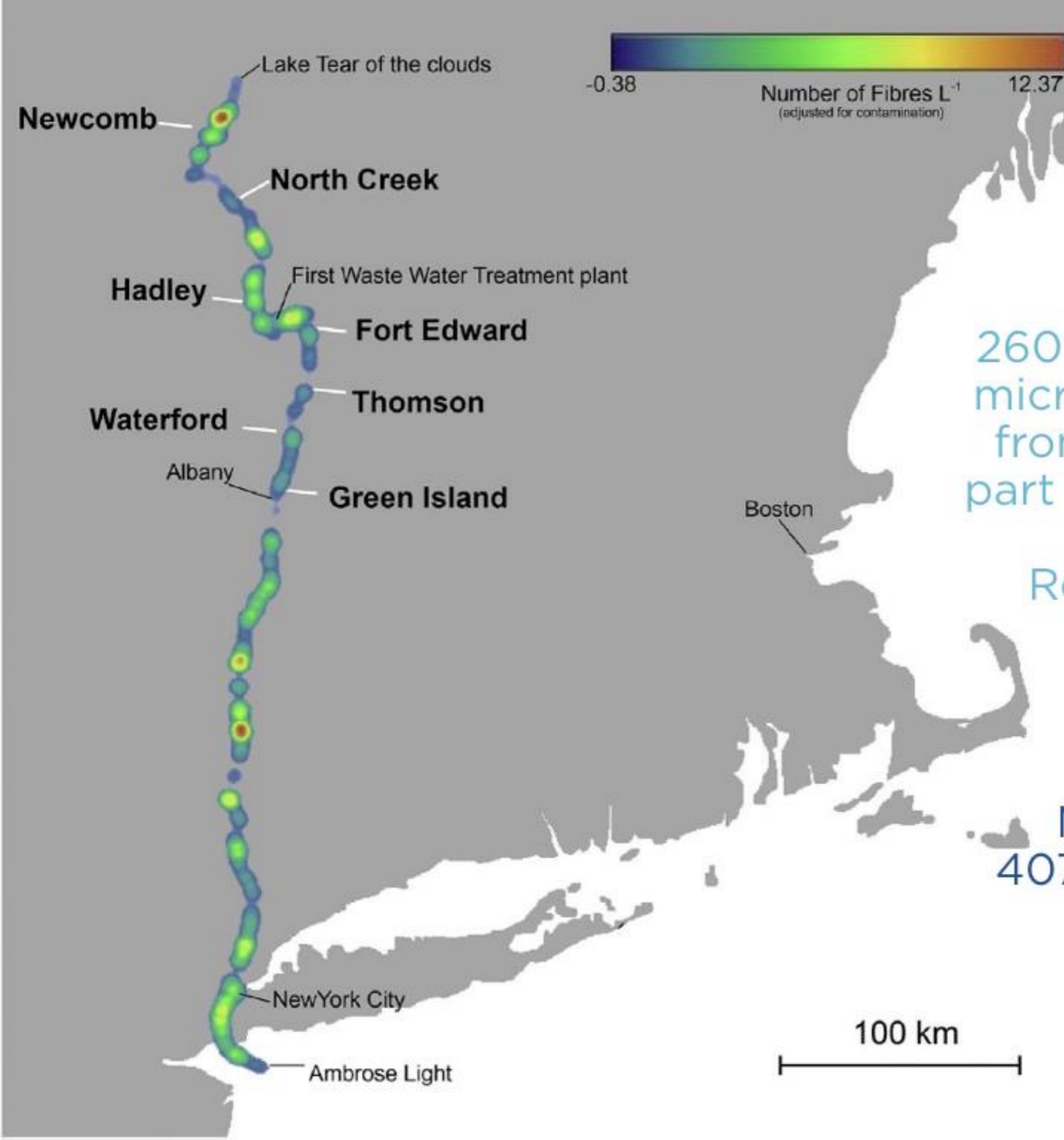


American Promise  
Oceanographic Research Vessel

# PATHS TO SOLUTIONS: MICRO AND NANOPLASTIC POLLUTION



American Promise  
Oceanographic Research Vessel

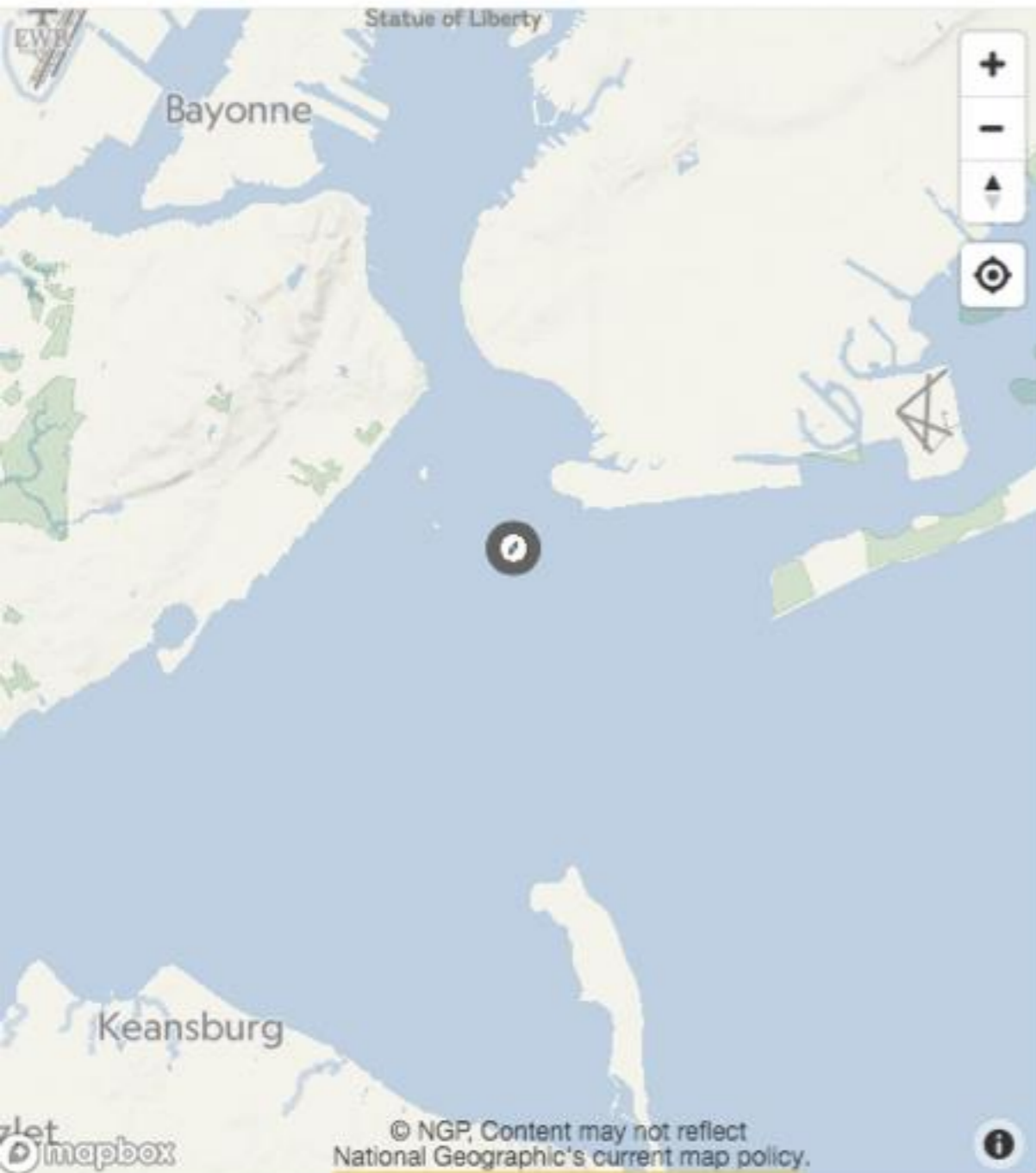


260 million - 1.02 billion microfibers/day flowing from non-tidal to tidal part of the Hudson River

Represents 60% of watershed.

Median average: 407 million fibers/day





# Hudson River Mountains to the Sea, Seafloor to the Sky Research and Technology Expedition

Latest update October 31, 2018

Started on October 31, 2018

Air Land Sea Urban

ADD VIDEO

Creating the first 4D heat map of microplastic pollution along an entire river and field testing innovations that will make microplastic research more robust in order to deploy

**AIR**



American Promise

**rozalia** project  
for a clean ocean



# AIR

1.5m (whole river)  
9.0m (Lower Hudson)  
8L/min pumps  
30 minute duration



**rozalia** project  
for a clean ocean



# SOIL



# SOIL

6" deep via auger or trowel  
3 samples between water's edge  
and top of bank per location  
Double-wrapped in foil





**SURFACE**



American Promise

**rozalia** project  
for a clean ocean



# SURFACE

1L grab sample  
Galvanized bucket

Triple washed hands, bucket and jar  
Control samples of all lines/textiles taken



American Promise

**rozalia** project  
for a clean ocean



# MID WATER COLUMN 1M FROM RIVER BOTTOM



*Vessel*

rozalia project

for a clean water



# MID WATER COLUMN 1M FROM RIVER BOTTOM

5L Niskin Bottle  
1L sample taken  
4.7mm aperture

*Vessel*

rozalia project

for a clean water



**NANOPLASTIC**



# NANOPLASTIC

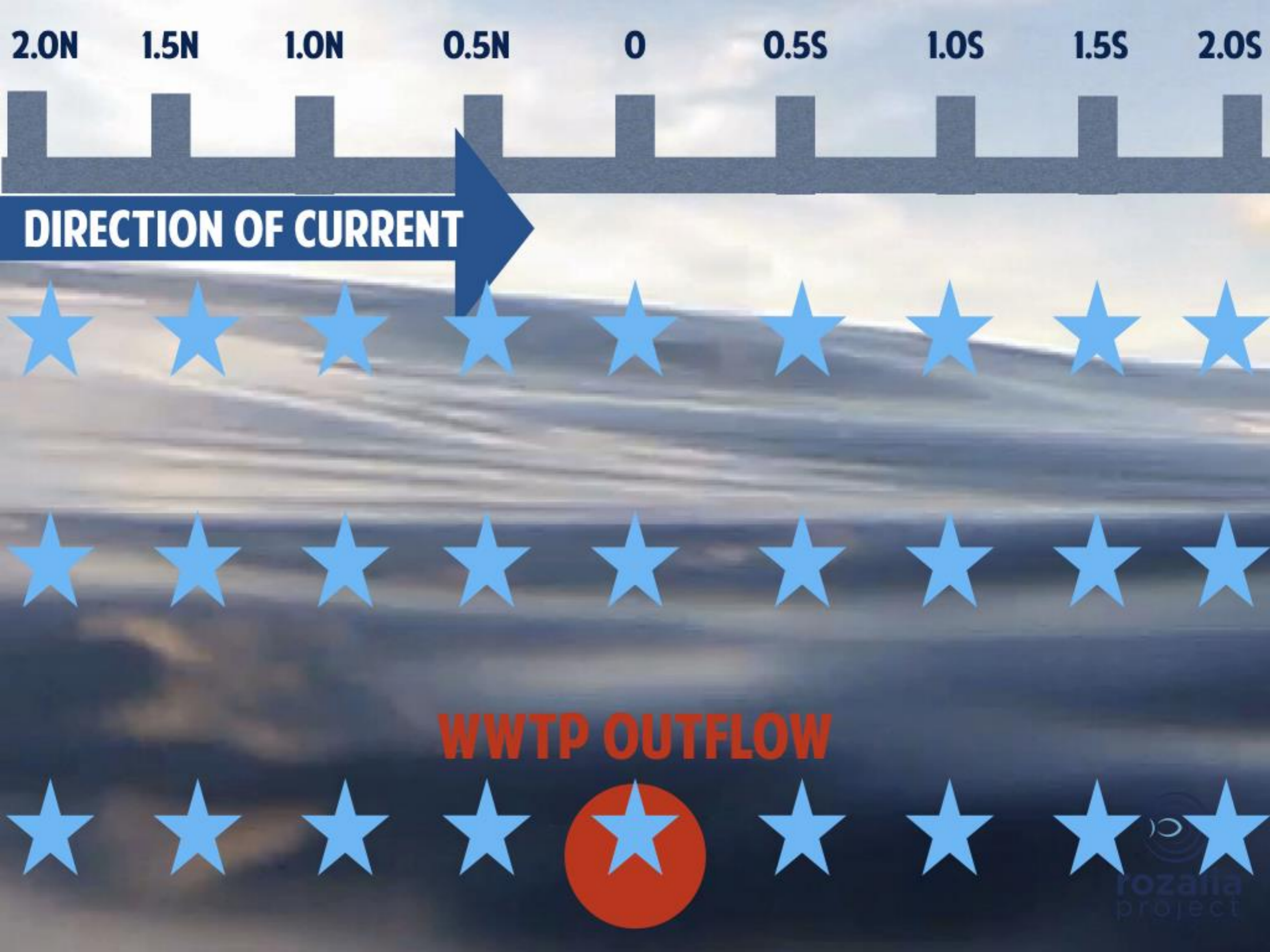
0.5ml

From surface sample bucket  
(after surface sample taken)

Triple rinsed pipetter, Eppendorf tubes

# WASTEWATER TREATMENT PLANT OUTFLOW STUDY





**DIRECTION OF CURRENT**

**WWTP OUTFLOW**

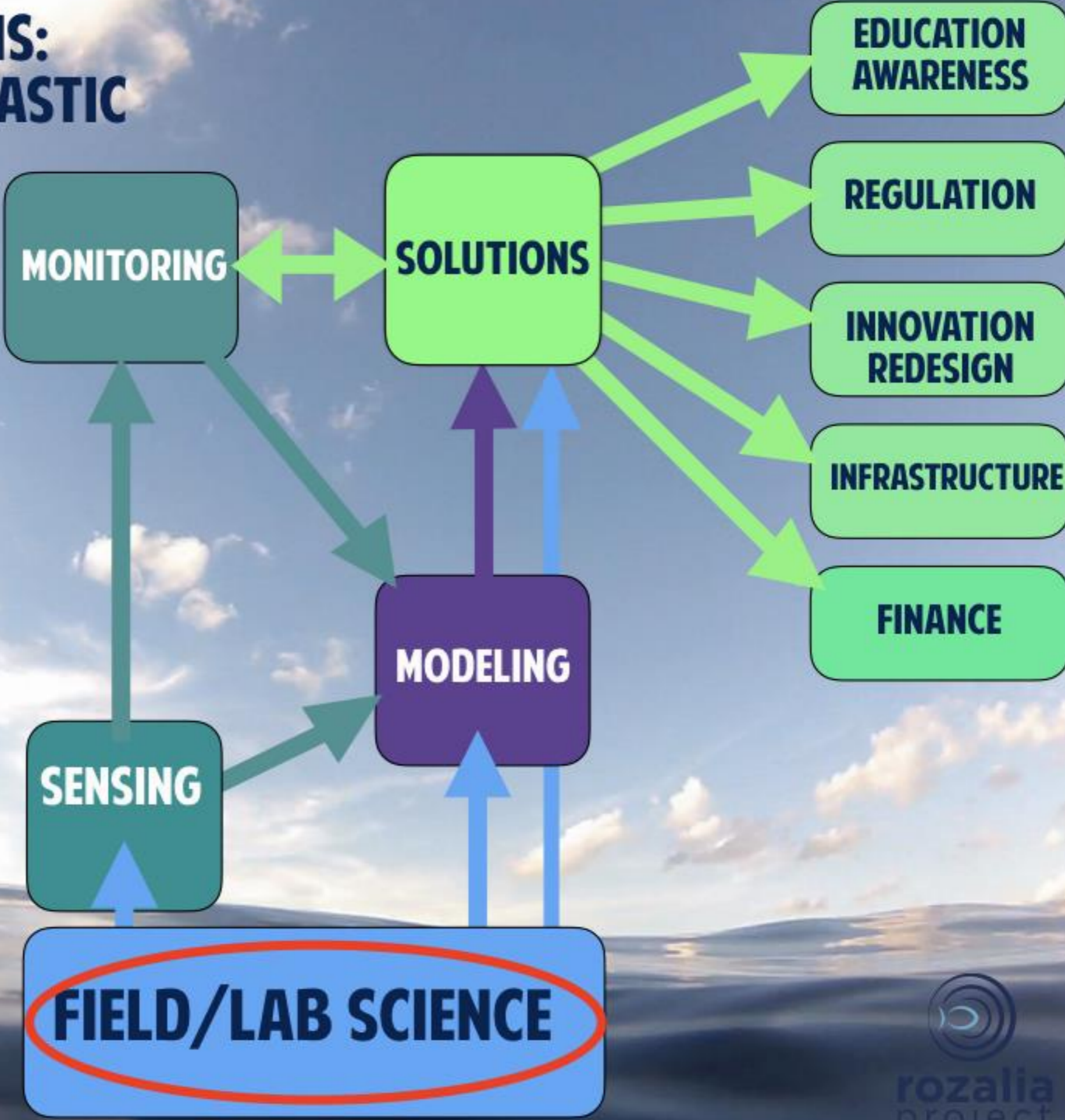


# EASYLIFT TAPE

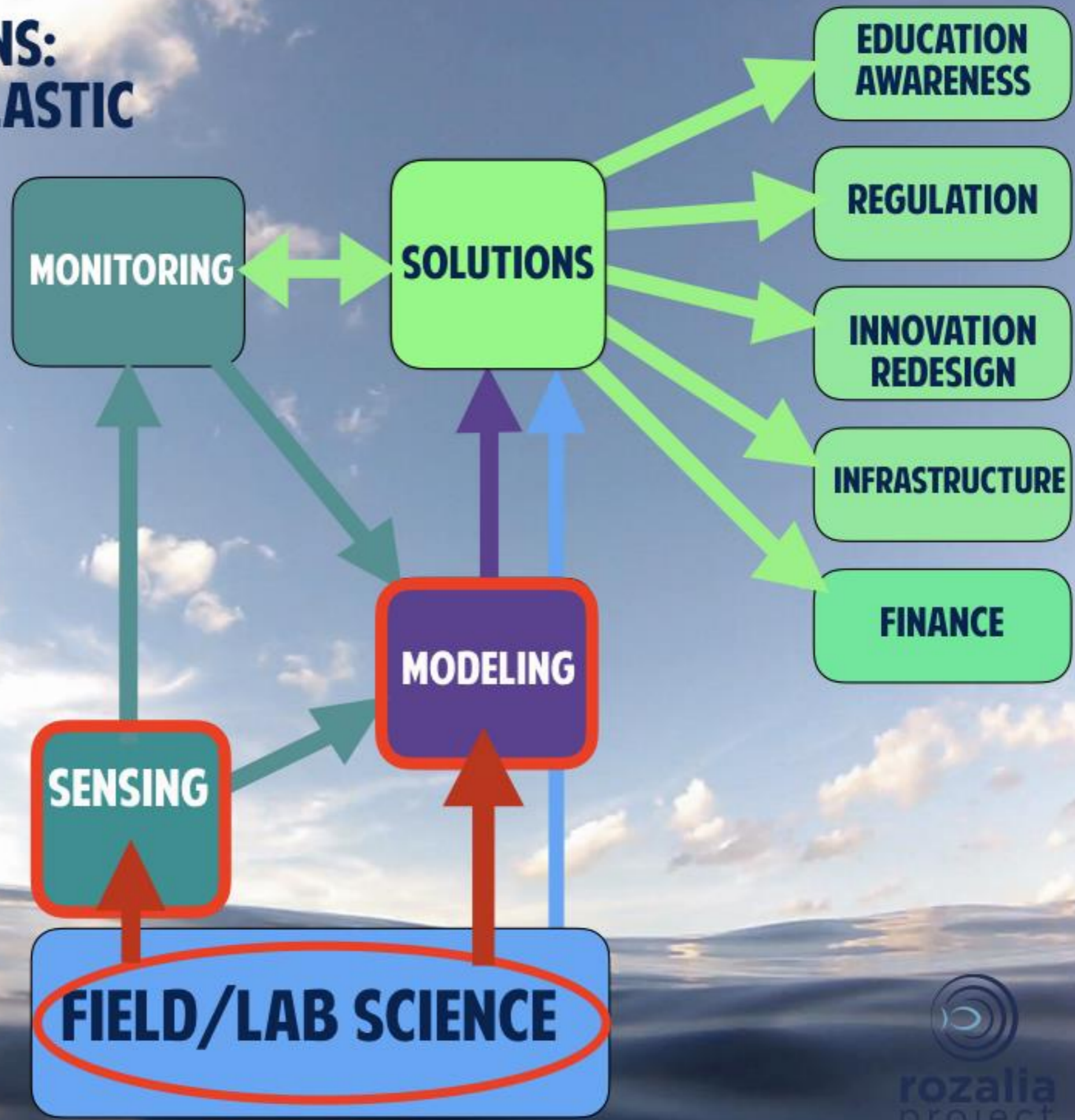


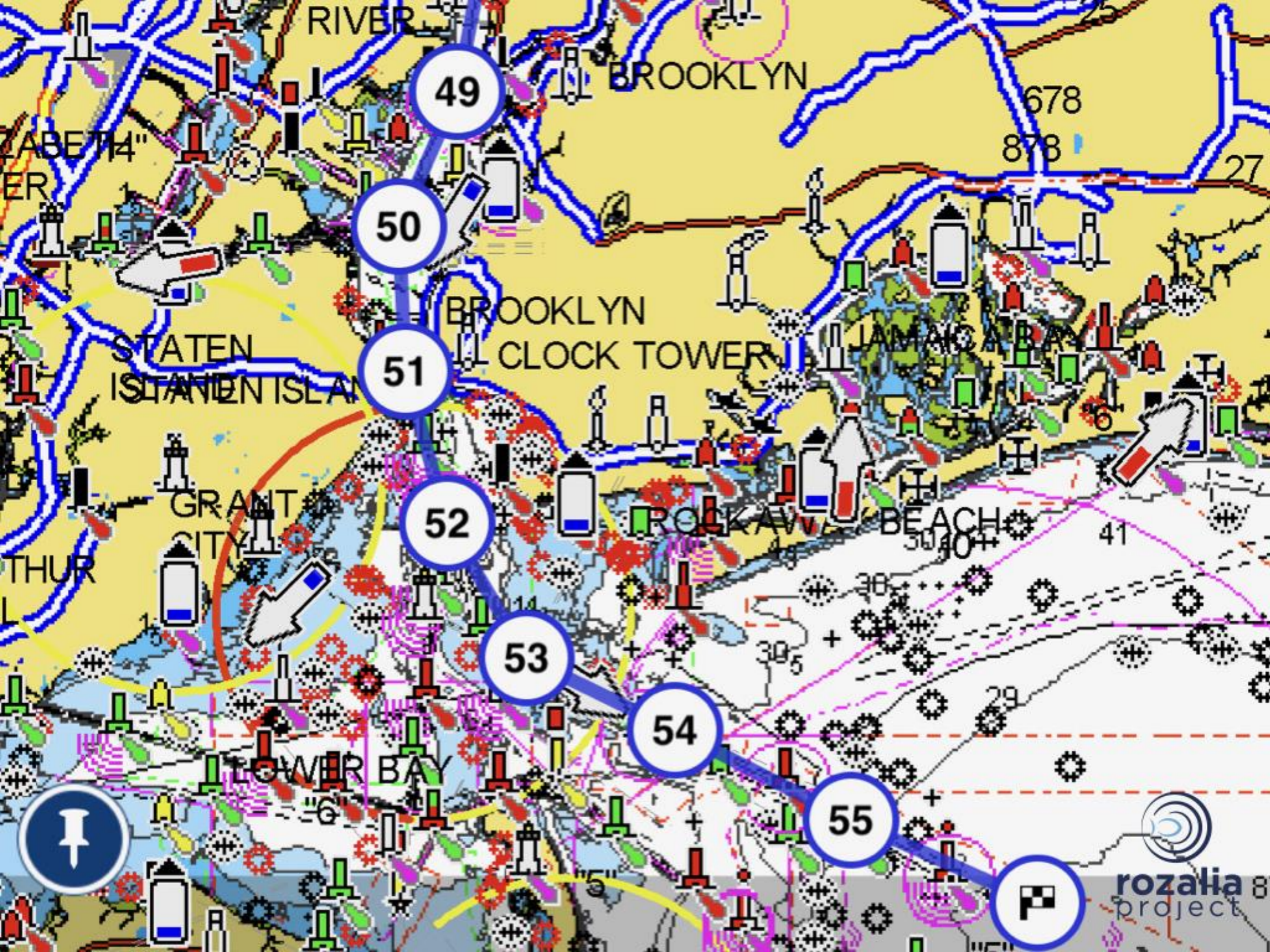


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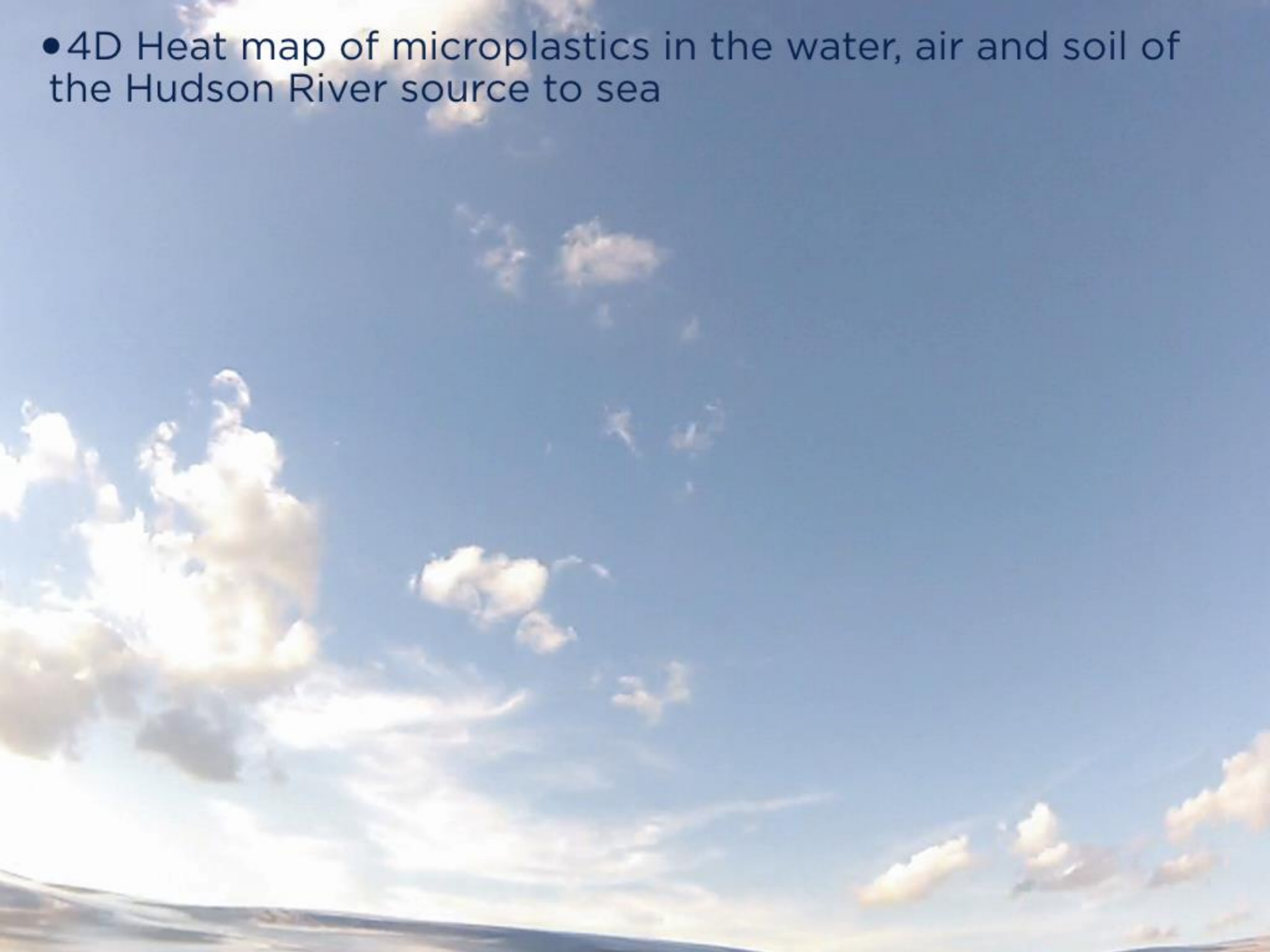
# AI & AUTO-IDENTIFICATION OF MARINE DEBRIS



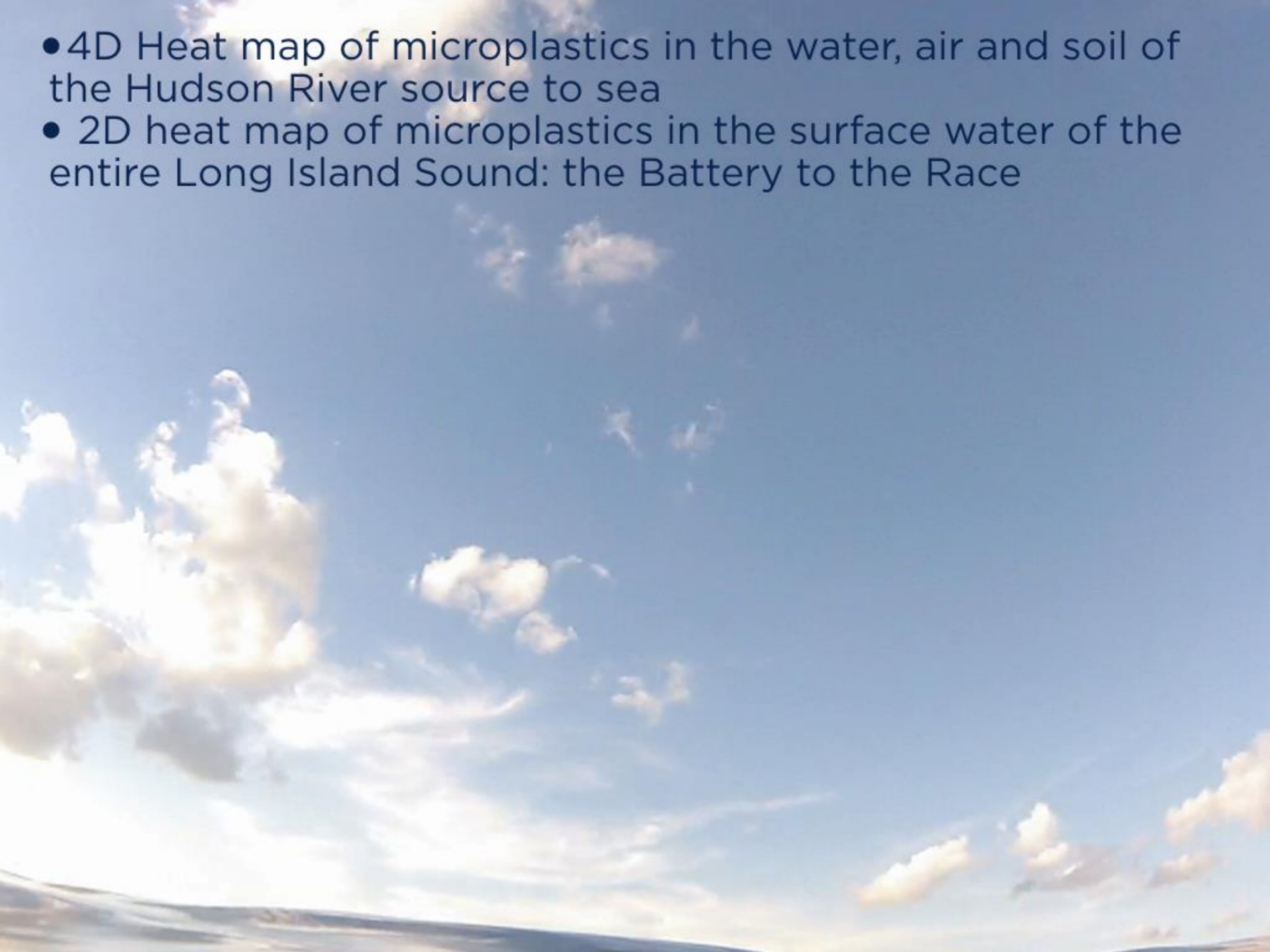




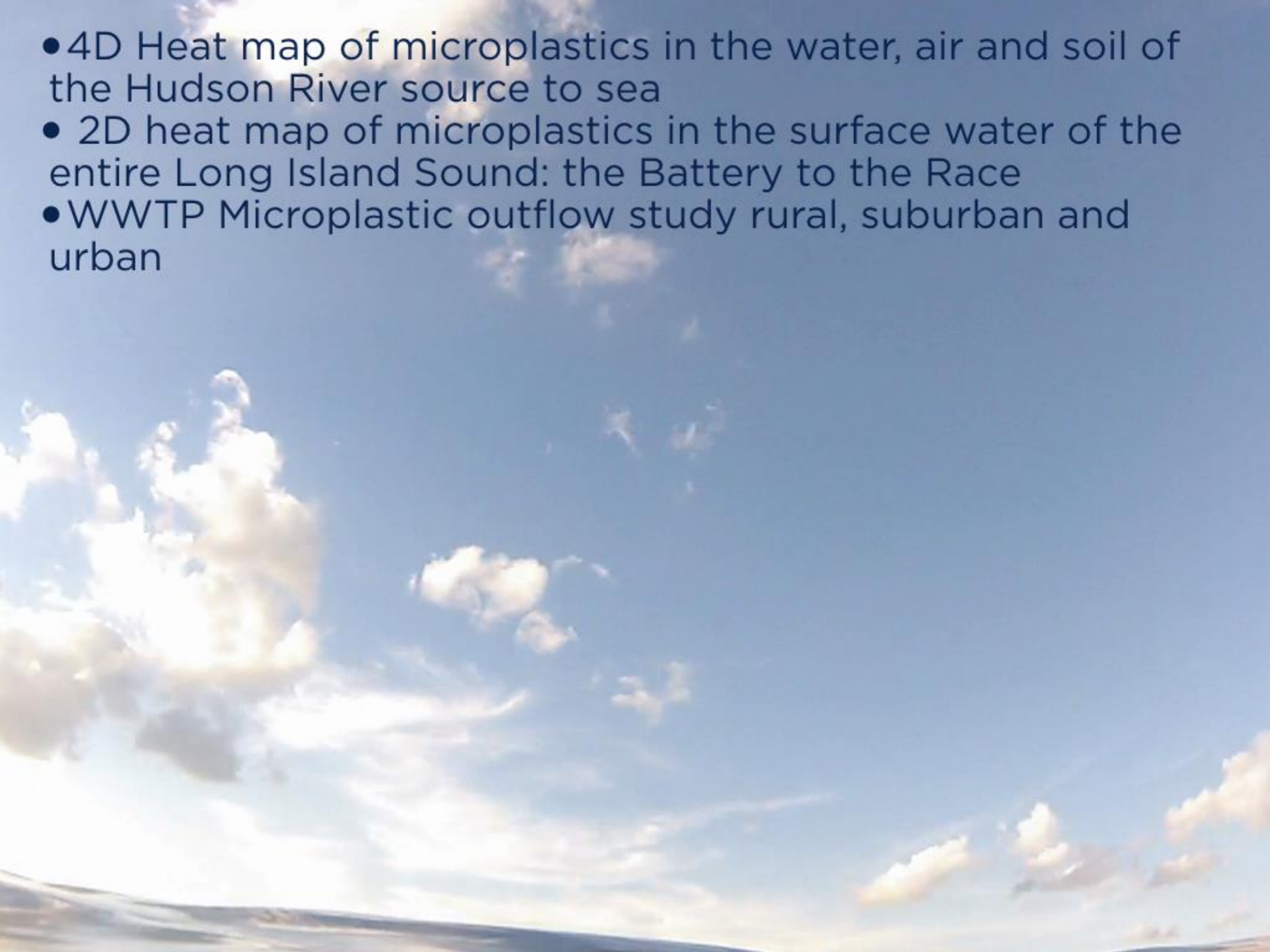
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- 4D Heat map of microplastics in the water, air and soil of the Hudson River source to sea
- 2D heat map of microplastics in the surface water of the entire Long Island Sound: the Battery to the Race



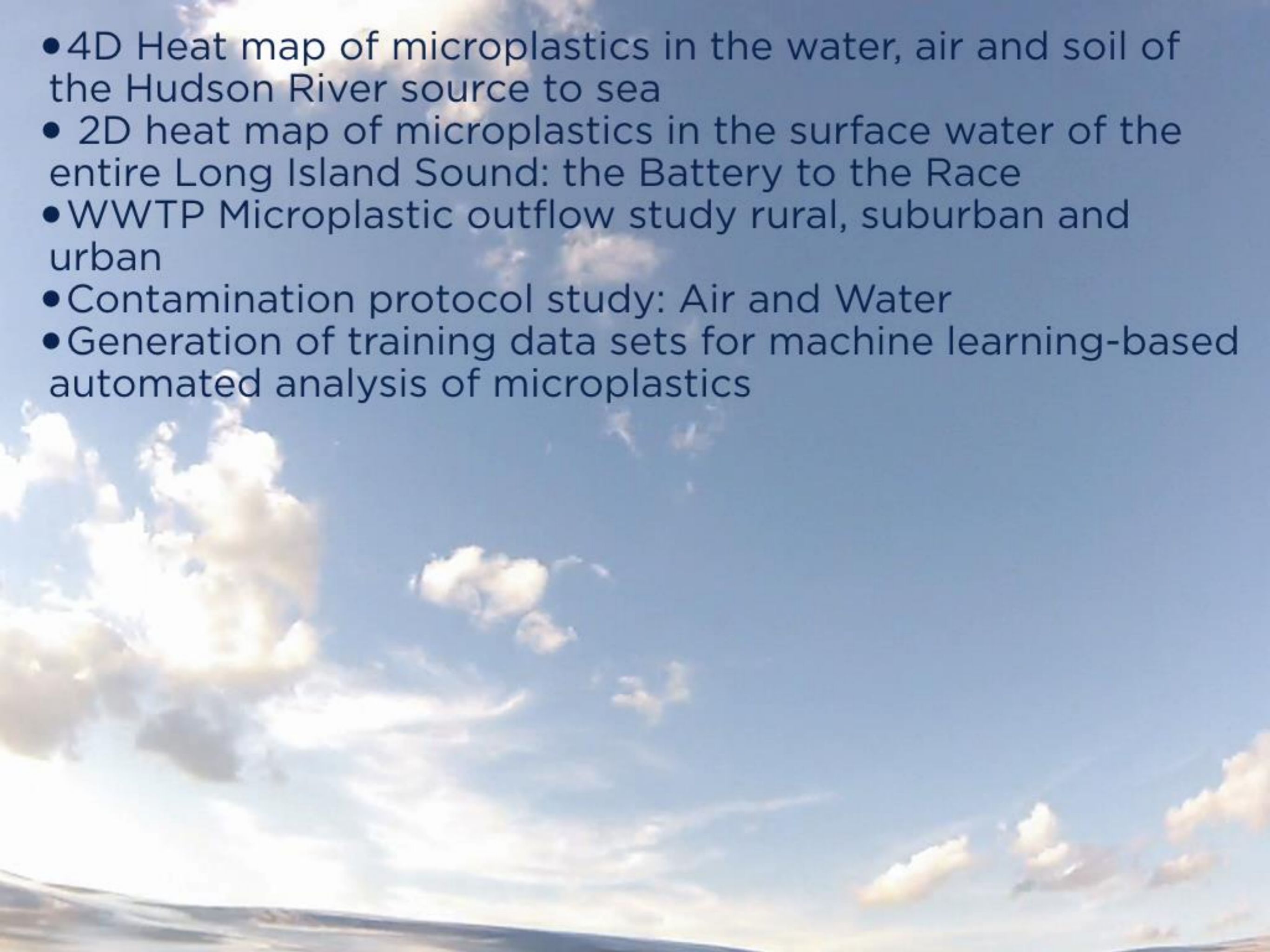
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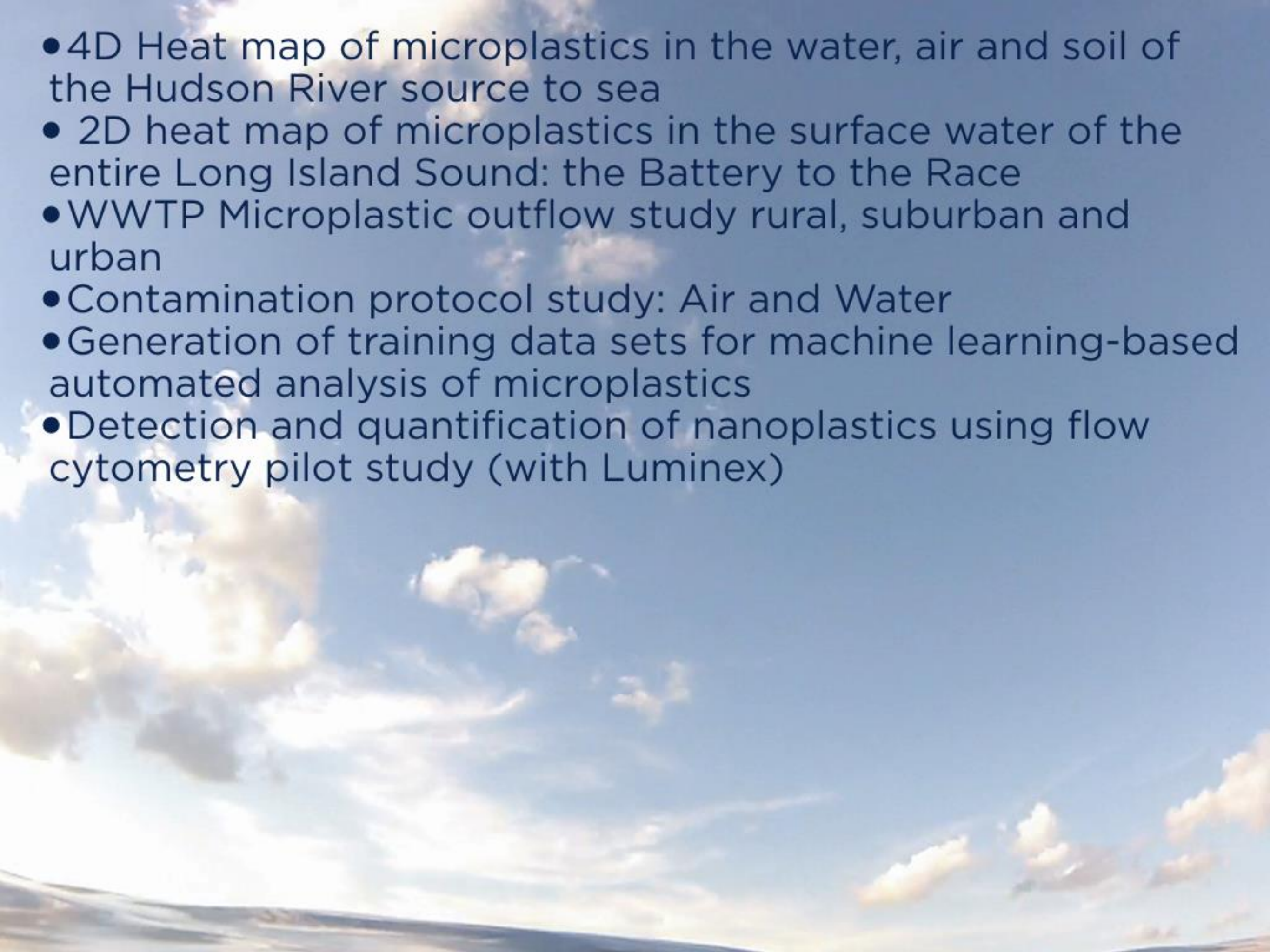


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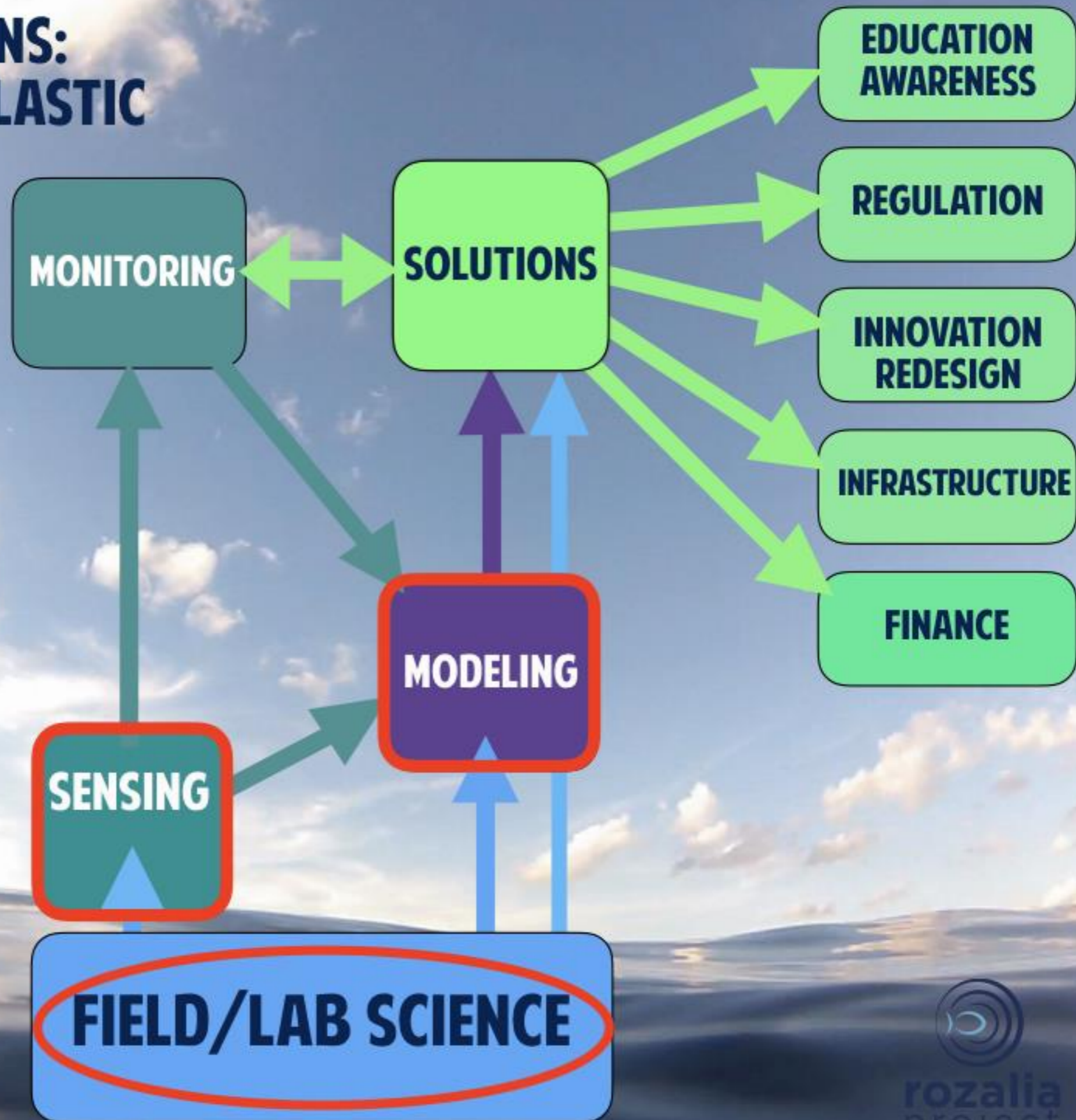


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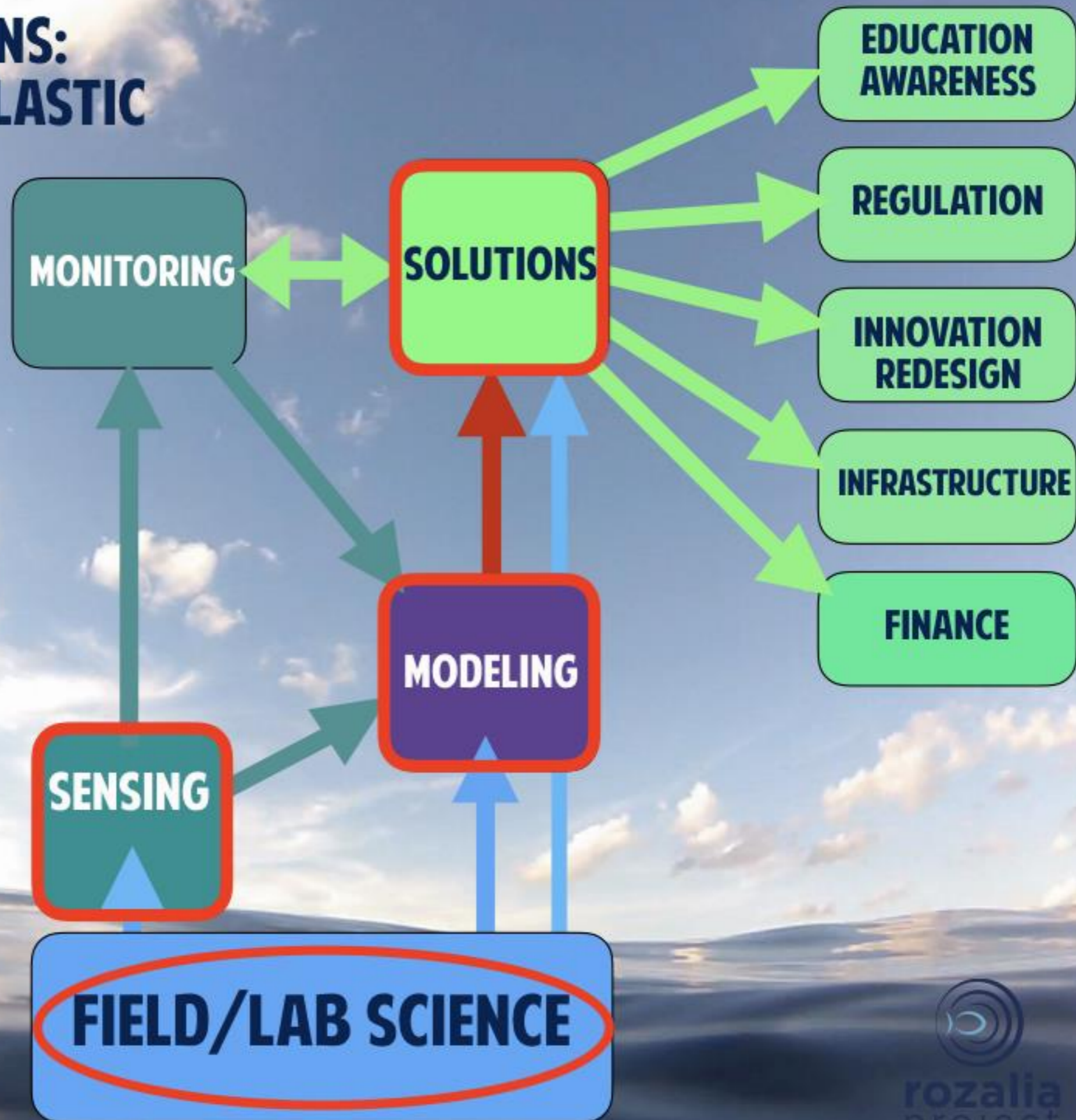
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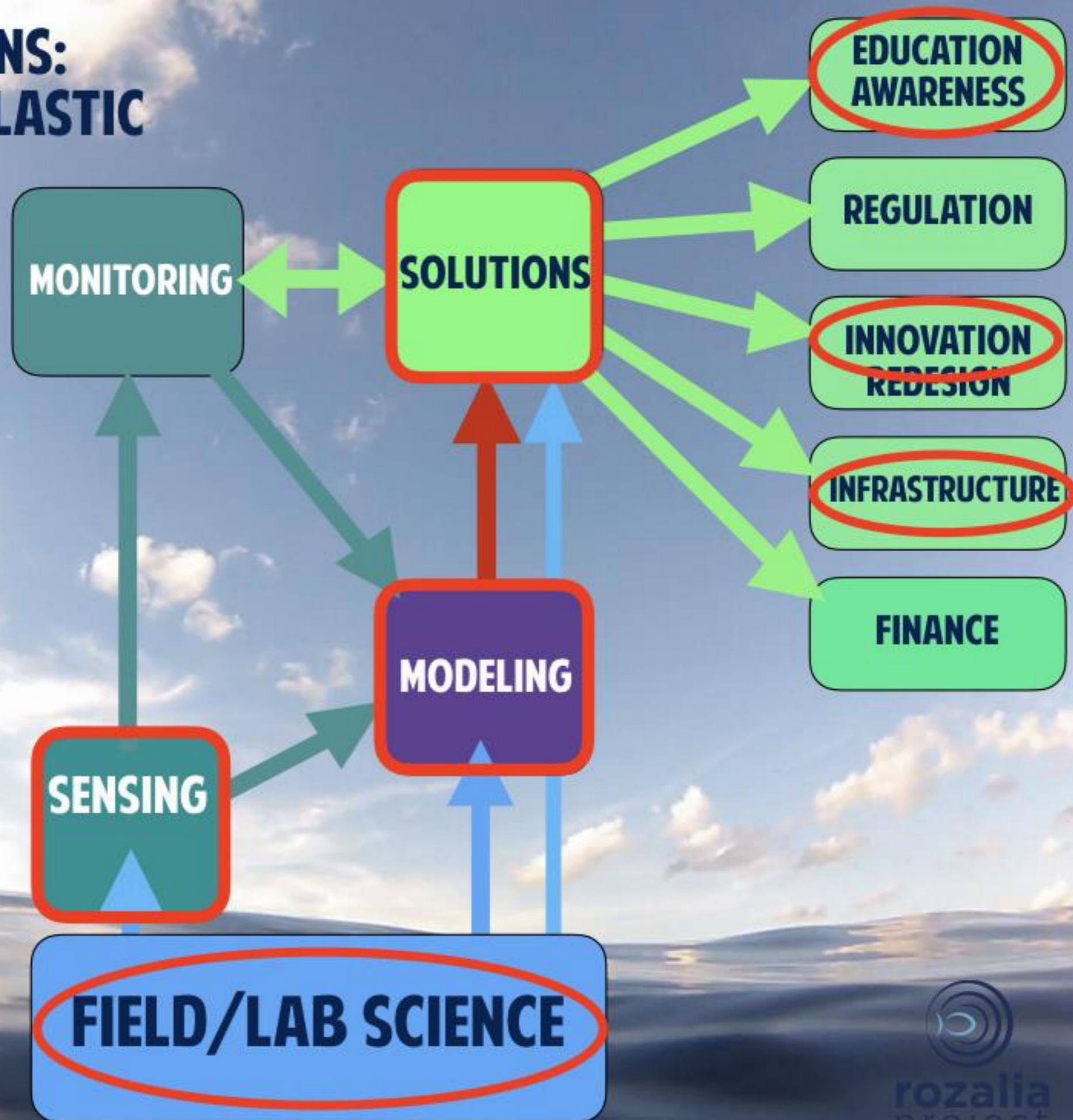
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INNOVATION



cora  
ball

# INFRASTRUCTURE

Cora 4 Test 1  
copr Rozalia Project





**EDUCATION**







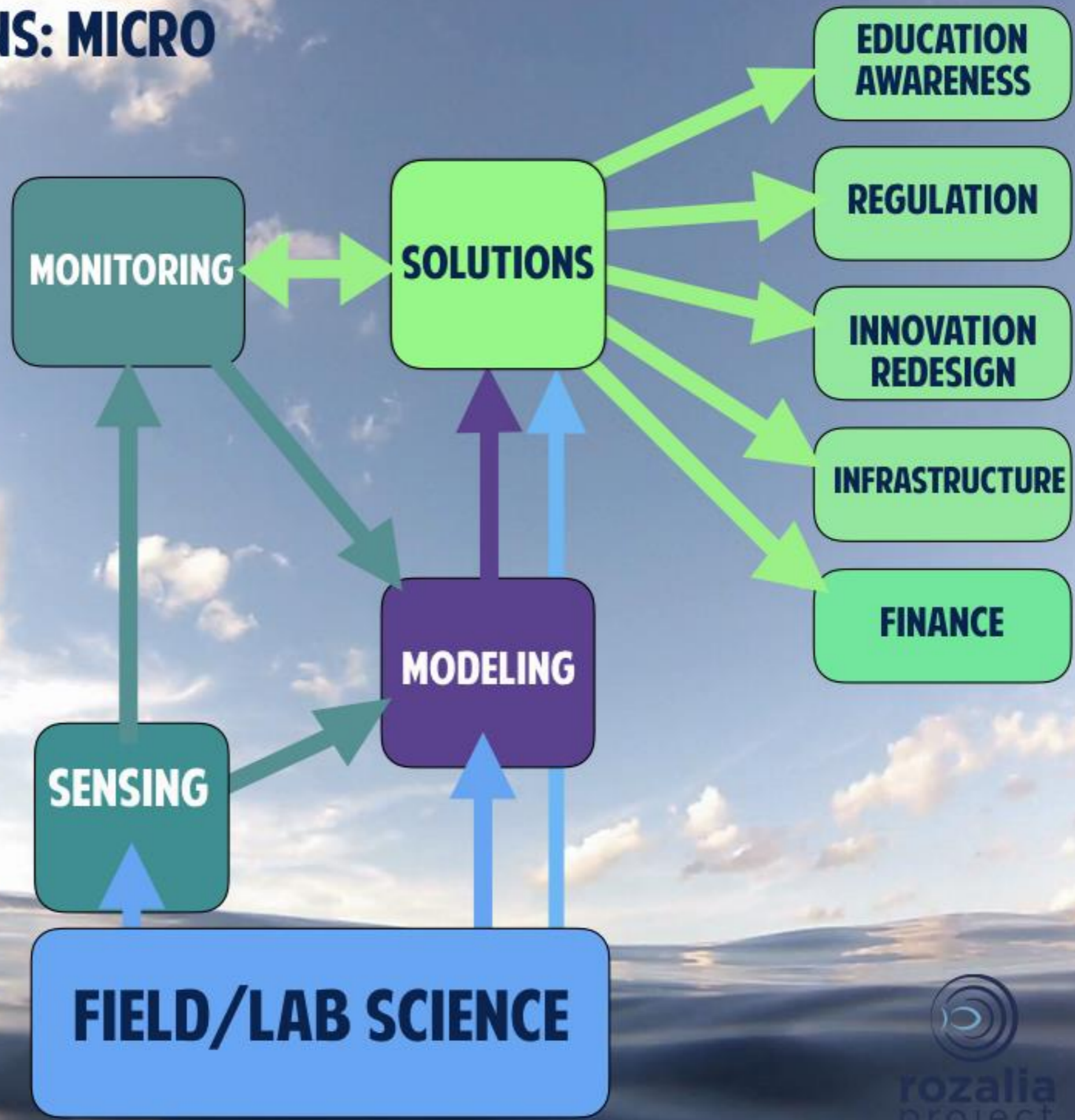


**rozalia**  
project





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# PATHS TO SOLUTIONS: MICRO AND NANOPLASTIC POLLUTION

**STAFFORDSHIRE UNIVERSITY**

**PATAGONIA  
OCEAN DIAGNOSTICS  
CENTER FOR DISEASE CONTROL**

**ONBOARD REPORTERS  
SUMMIT TEAM  
EDUCATION TEAM  
DELIVERY CREWS**

**HURRICANE ISLAND CENTER FOR  
SCIENCE AND LEADERSHIP  
AMERICAN YC  
SATCHEM HEAD YC**

- EDUCATION AWARENESS
- REGULATION
- INNOVATION REDESIGN
- INFRASTRUCTURE
- FINANCE

**NATIONAL GEOGRAPHIC  
KILROY REALTY  
SCHMIDT MARINE TECHNOLOGY PARTNERS  
SURF SWEETS  
PATAGONIA FREEPORT**





**Thank you!**



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**802-578-6120**

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**Thank you!**



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